

CURRICULUM AND SYLLABI

(AY 2022-2023)

B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

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CURRICULUM AND SYLLABI

(AY 2022-2023 Admitted Students)



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VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

> Transforming life through excellence in education and research.

MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

- World class Education: Excellence in education, grounded in ethics and critical thinking, for improvement of life.
- Cutting edge Research: An innovation ecosystem to extend knowledge and solve critical problems.
- Impactful People: Happy, accountable, caring and effective workforce and students.
- *Rewarding Co-creations:* Active collaboration with national & international industries & universities for productivity and economic development.
- Service to Society: Service to the region and world through knowledge and compassion.



VISION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

To be a world-renowned centre of education, research and service in computing and allied domains.

MISSION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

- To offer computing education programs with the goal that the students become technically competent and develop lifelong learning skill.
- ➢ To undertake path-breaking research that creates new computing technologies and solutions for industry and society at large.
- To foster vibrant outreach programs for industry, research organizations, academia and society.



B. Tech. Computer Science and Engineering and Business Systems

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- Graduates will be engineering practitioners and leaders, who would help solve industry's technological problems.
- Graduates will be engineering professionals, innovators or entrepreneurs engaged in technology development, technology deployment, or engineering system implementation in industry.
- Graduates will function in their profession with social awareness and responsibility.
- Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.
- Graduates will be successful in pursuing higher studies in engineering or management.
- ▶ Graduates will pursue career paths in teaching or research.



B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

PROGRAMME OUTCOMES (POs)

- PO_01: Having an ability to apply mathematics and science in engineering applications.
- PO_02: Having a clear understanding of the subject related concepts and of contemporary issues.
- PO_03: Having an ability to design a component or a product applying all the relevant standards and with realistic constraints.
- PO_04: Having an ability to design and conduct experiments, as well as to analyze and interpret data.
- PO_05: Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.
- PO_06: Having problem solving ability-solving social issues and engineering problems.
- > **PO_07:** Having adaptive thinking and adaptability.
- PO_08: Having a clear understanding of professional and ethical responsibility.

- > **PO_09:** Having cross cultural competency exhibited by working in teams.
- > **PO_10:** Having a good working knowledge of communicating in English.
- PO_11: Having a good cognitive load management [discriminate and filter the available data] skills.
- > **PO_12:** Having interest in lifelong learning.



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PROGRAMME SPECIFIC OUTCOMES (PSOs)

- The ability to apply theoretical foundations of Computer Science and problem-solving skills through programming techniques for complex real time problems using appropriate data structures and algorithms.
- The ability to design/develop hardware and software interfaces along with database management to meet the needs of industry.
- The ability to demonstrate personal, organizational and entrepreneurship skills through critical thinking, engage themselves in life-long learning by following innovations in business, science & technology.



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CREDIT STRUCTURE

Category Wise Credit Distribution

| Category | Credits |
|--------------------------|---------|
| Programme Core (PC) | 72 |
| Programme Elective (PE) | 21 |
| University Core (UC) | 52 |
| University Elective (UE) | 6 |
| Specialization Elective | 9 |
| Non-Credit Course | - |
| Total Credits | 160 |





| Programme | Programme | University | University | Specialization | Total |
|-----------|-----------|------------|------------|----------------|---------|
| Core | Elective | Core | Elective | Elective | Credits |
| 72 | 21 | 52 | 6 | 9 | 160 |

| Course Code | Course Title | Course Type | L | Т | Р | J | С |
|-------------|--|-------------|---|---|---|---|---|
| | PROGRAMME CORE | | | • | | | |
| CBS1003 | Data Structures and Algorithms | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1004 | Computer Architecture and Organization | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1005 | Software Engineering Methodologies | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1006 | Principles of Operating Systems | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1007 | Database Systems | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1008 | Operations Research | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS1009 | Computational Statistics | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS2002 | Formal Languages and Automata Theory | TH | 3 | 0 | 0 | 0 | 3 |
| CBS2003 | Design Thinking | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3001 | Computer Networks | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3002 | Information Security | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3003 | Design and Analysis of Algorithms | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3004 | Artificial Intelligence | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3011 | Usability Design of Software Applications | ETL | 2 | 0 | 2 | 0 | 3 |
| CBS3012 | IT Project Management | ETL | 2 | 0 | 2 | 0 | 3 |
| EEE1001 | Basic Electrical and Electronics Engineering | ETL | 2 | 0 | 2 | 0 | 3 |
| MAT1004 | Discrete Mathematics | TH | 3 | 0 | 0 | 0 | 3 |
| MAT2004 | Linear Algebra | TH | 3 | 1 | 0 | 0 | 4 |
| MAT2005 | Data Science and Statistical Modelling | ETL | 2 | 0 | 2 | 0 | 3 |
| MGT1064 | Financial and Cost Accounting | TH | 3 | 0 | 0 | 0 | 3 |
| MGT1065 | Fundamentals of Management | TH | 2 | 0 | 0 | 0 | 2 |
| MGT2002 | Marketing Research and Marketing Management | TH | 3 | 0 | 0 | 0 | 3 |
| MGT2003 | Financial Management | TH | 3 | 0 | 0 | 0 | 3 |
| MGT3016 | Services Science and Service Operational Management | ETL | 2 | 0 | 2 | 0 | 3 |

| Course Code | Course Title | Course Type | L | Т | Р | J | С |
|-------------|---------------------------------------|--------------------|---|---|---|---|---|
| | PROGRAMME ELECT | TIVE | | | | | |
| CBS1011 | Programming in Python | ETL | 2 | 0 | 2 | 0 | 3 |
| CSE1007 | JAVA Programming | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3005 | Cloud, Microservices and Applications | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3006 | Machine Learning | ETLP | 2 | 0 | 2 | 4 | 4 |
| CBS3007 | Data Mining and Analytics | ETL | 3 | 0 | 2 | 0 | 4 |





| Course Code | Course Title | Course Type | L | Т | Р | J | С |
|---------------|---|-------------|---|---|---|---|----|
| CBS3008 | Introduction to Internet of Things | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3009 | Advanced Social, Text and Media Analytics | TH | 3 | 0 | 0 | 0 | 3 |
| CBS3010 | Mobile Computing | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3013 | Conversational Systems | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3014 | Modern Web Applications | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS3015 | Information Systems Audit and Control | TH | 3 | 0 | 0 | 0 | 3 |
| CBS3016 | Cognitive Science and Analytics | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS4001 | Robotics and Embedded Systems | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS4002 | Cryptology and Analysis | TH | 3 | 0 | 0 | 0 | 3 |
| CBS4003 | Quantum Computation and Quantum Information | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS4004 | Image Processing and Pattern Recognition | ETP | 3 | 0 | 0 | 4 | 4 |
| CBS4005 | Enterprise Systems | ETL | 3 | 0 | 2 | 0 | 4 |
| Course Code | Course Title | Course Type | L | Т | Р | J | С |
| | UNIVERSITY CORE | | | | | | |
| CBS1002 | Object Oriented Programming | ETL | 3 | 0 | 2 | 0 | 4 |
| CBS1901 | Technical Answers for Real World Problems (TARP) | ETP | 1 | 0 | 0 | 4 | 2 |
| CBS1902 | Industrial Project | PJT | 0 | 0 | 0 | 0 | 1 |
| CBS1903 | Comprehensive Examination | PJT | 0 | 0 | 0 | 0 | 1 |
| CBS1904 | Capstone Project | PJT | 0 | 0 | 0 | 0 | 12 |
| CHY1701 | Engineering Chemistry | ETL | 3 | 0 | 2 | 0 | 4 |
| CSE1008 | Programming in C | ETL | 3 | 0 | 2 | 0 | 4 |
| ENG1013 | Business Communication and Value Science - I | ETL | 1 | 0 | 2 | 0 | 2 |
| ENG1014 | Business Communication and Value Science - II | ETL | 1 | 0 | 2 | 0 | 2 |
| ENG1017 | Business Communication and Value Science- III | ETL | 1 | 0 | 2 | 0 | 2 |
| ENG1018 | Business Communication and Value Science- IV | ETL | 1 | 0 | 2 | 0 | 2 |
| ENG1901 | Technical English - I | LO | 0 | 0 | 4 | 0 | 2 |
| ENG1902 | Technical English - II | LO | 0 | 0 | 4 | 0 | 2 |
| ENG1903 | Advanced Technical English | ELP | 0 | 0 | 2 | 4 | 2 |
| HUM1021 | Ethics and Values | TH | 2 | 0 | 0 | 0 | 2 |
| MAT1017 | Probability and Statistics | TH | 3 | 0 | 0 | 0 | 3 |
| MGT2001 | Introduction to Innovation, IP Management and Entrepreneurship | TH | 3 | 0 | 0 | 0 | 3 |
| PHY1005 | Modern Physics | ETL | 3 | 0 | 2 | 0 | 4 |
| FLC4097 | Foreign Language Course Basket | CDB | 0 | 0 | 0 | 0 | 2 |
| ESP1001 - ESI | PANOL FUNDAMENTAL – TH | | | r | | | |



ENG1000

ENG2000

EXC4097

Foundation English - I

Foundation English - II

Co-Extra Curricular Basket



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| ESP2001 - ESPANOL INTERMEDIO – ETL |
|---------------------------------------|
| FRE2001 - Francais progressif – ETL |
| GER1001 - Grundstufe Deutsch – TH |
| GER2001 - Mittelstufe Deutsch – ETL |
| GRE1001 - Modern Greek – TH |
| JAP1001 - Japanese for Beginners – TH |
| RUS1001 - Russian for Beginners – TH |

| Course Code | Course Title | Course Type | L | Т | Р | J | C |
|----------------|-------------------------------------|-------------|---|---|---|---|---|
| | SPECIALIZATION ELE | CTIVE | | | | | |
| HUM1046 | Behavioral Economics | TH | 3 | 0 | 0 | 0 | 3 |
| HUM1047 | Engineering Economics | TH | 3 | 0 | 0 | 0 | 3 |
| HUM1048 | Industrial Psychology | TH | 3 | 0 | 0 | 0 | 3 |
| MGT3001 | Business Strategy | TH | 3 | 0 | 0 | 0 | 3 |
| MGT3002 | Advanced Finance | TH | 3 | 0 | 0 | 0 | 3 |
| MGT4004 | Human Resource Management | TH | 3 | 0 | 0 | 0 | 3 |
| MGT4005 | Computational Finance and Modelling | ETL | 3 | 0 | 2 | 0 | 4 |
| | | • | | • | • | | |
| Course Code | Course Title | Course Type | L | Т | Р | J | С |
| | NON-CREDIT COURS | SES | | | | | |
| CHY1002 | Environmental Sciences | TH | 3 | 0 | 0 | 0 | 3 |

0

0

0

LO

LO

CDB

0

0

0

4 0

4

0

0

0

2

2

2



B. Tech Computer Science and Engineering and Business Systems

PROGRAMME CORE

(AY 2022 - 2023)

B. Tech. Computer Science and Engineering and Business Systems

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| Sl.No. | Course Code | Course Title | Page No. |
|--------|-------------|--|----------|
| 1. | CBS1003 | Data Structures and Algorithms | 13 |
| 2. | CBS1004 | Computer Architecture and Organization | 15 |
| 3. | CBS1005 | Software Engineering Methodologies | 17 |
| 4. | CBS1006 | Principles of Operating Systems | 19 |
| 5. | CBS1007 | Database Systems | 22 |
| 6. | CBS1008 | Operations Research | 24 |
| 7. | CBS1009 | Computational Statistics | 26 |
| 8. | CBS2002 | Formal Languages and Automata Theory | 29 |
| 9. | CBS2003 | Design Thinking | 31 |
| 10. | CBS3001 | Computer Networks | 33 |
| 11. | CBS3002 | Information Security | 35 |
| 12. | CBS3003 | Design and Analysis of Algorithms | 37 |
| 13. | CBS3004 | Artificial Intelligence | 39 |
| 14. | CBS3011 | Usability Design of Software Applications | 41 |
| 15. | CBS3012 | IT Project Management | 43 |
| 16. | EEE1001 | Basic Electrical and Electronics Engineering | 45 |
| 17. | MAT1004 | Discrete Mathematics | 47 |
| 18. | MAT2004 | Linear Algebra | 49 |
| 19. | MAT2005 | Data Science and Statistical Modelling | 51 |
| 20. | MGT1064 | Financial and Cost Accounting | 53 |
| 21. | MGT1065 | Fundamentals of Management | 55 |
| 22. | MGT2002 | Marketing Research and Marketing Management | 57 |
| 23. | MGT2003 | Financial Management | 59 |
| 24. | MGT3016 | Services Science and Service Operational Management | 61 |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | | LT | P J C |
|--|---|---|---------------------|---|
| CBS1003 | Data Structures and Algorithms | , | 2 0 | 2 0 3 |
| Pre-requisite | NIL | | | ous version |
| | | | 1 | v. 1.0 |
| Course Objective | | | | |
| - | asymptotic performance of algorithms. | | | |
| - | inear and non-linear data structures and their application | | | |
| 3. To Perform sear | ching and sorting using various techniques and Graphs. | | | |
| Expected Course | Outcome: | | | |
| <u> </u> | of this course, students will be able to: | | | |
| - | c terminologies in data structures. | | | |
| | ures of linear data structures and their applications. | | | |
| | rious types of nonlinear data structures and their applica | tions in re | al world. | _ |
| | iate sorting and searching technique for the given probl | | | |
| | sing files and understand various access methods | CIII. | | |
| - | t algorithmic solution and data structures to real-world | nrohleme | | |
| | and data structures to real-world | problems. | | |
| Module:1 | Introduction to Algorithm & Data Organization | | | 3 hour |
| | 8 | | | |
| $\Delta \log r_1 thm specific$ | vation Recursion Performance analysis Asymptotic N | otation - T | The Rig_(| () ()mega and |
| | cation, Recursion, Performance analysis, Asymptotic N | | | |
| Theta notation, P | eation, Recursion, Performance analysis, Asymptotic N Programming Style, Refinement of Coding - Time-S | | | |
| | | | | |
| Theta notation, F Abstraction | Programming Style, Refinement of Coding - Time-S | | | Testing, Data |
| Theta notation, F Abstraction Module:2 | Programming Style, Refinement of Coding - Time-S | Space Tra | de Off, | Testing, Data |
| Theta notation, F Abstraction Module:2 Array, Stack, Que | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation | Space Tra | de Off, | Testing, Data |
| Theta notation, F Abstraction Module:2 | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation | Space Tra | de Off, | Testing, Data |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation | Space Tra | de Off, | Testing, Data |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. | Space Tra | de Off, | Testing, Data 4 hour Applications o 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures | Space Tra | de Off, | Testing, Data 4 hour Applications o 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 | Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures | Space Tra s, Operati ee, AVL T | de Off, | Testing, Data 4 hour Applications o 5 hour ay Tree). 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures e, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search for the second | Space Tra s, Operati ee, AVL T | de Off, | Testing, Data 4 hour Applications o 5 hour ay Tree). 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, | Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures | Space Tra s, Operati ee, AVL T | de Off, | Testing, Data 4 hour Applications o 5 hour ay Tree). 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures | Space Tra s, Operati ee, AVL T | de Off, | Testing, Data 4 hour Applications of 5 hour ay Tree). 5 hour algorithms and |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures e, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures | Space Tra s, Operati ee, AVL T arch and tr | de Off, | Testing, Data 4 hour Applications of 5 hour algorithms and 5 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures a, Binary Search, Comparison Trees, Breadth First Sear | Space Tra is, Operati ee, AVL T arch and tr | de Off, ions & A | Testing, Data 4 hour Applications of 5 hour ay Tree). 5 hour algorithms and 5 hour arch, Insertion |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search Sort, Selection Sor | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures e, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures | Space Tra is, Operati ee, AVL T arch and tr | de Off, ions & A | Testing, Data 4 hour Applications of 5 hour ay Tree). 5 hour algorithms and 5 hour arch, Insertion |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures a, Binary Search, Comparison Trees, Breadth First Sear | Space Tra is, Operati ee, AVL T arch and tr | de Off, ions & A | Testing, Data 4 hour Applications of 5 hour ay Tree). 5 hour algorithms and 5 hour arch, Insertion |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search Sort, Selection Son to Hashing | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (seas) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures a, Binary Search, Comparison Trees, Breadth First Sear | Space Tra is, Operati ee, AVL T arch and tr | de Off, ions & A | Testing, Data 4 hour Applications of 5 hour ay Tree). 5 hour algorithms and 5 hour arch, Insertion |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search Sort, Selection Sor to Hashing Module:6 | Programming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures e, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (sease) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures a, Binary Search, Comparison Trees, Breadth First Search, Shell Sort, Divide and Conquer Sort, Merge Sort, Question | Space Tra s, Operati ee, AVL T arch and tr rch, Depth uick Sort, 1 | de Off, | Testing, Data 4 hour Applications of 5 hour algorithms and 5 hour arch, Insertion rt, Introduction 3 hour |
| Theta notation, F Abstraction Module:2 Array, Stack, Que Linear Data Struct Module:3 Trees (Binary Tree Module:4 Graphs (Directed, complexity analysi Module:5 Sequential Search Sort, Selection Sor to Hashing Module:6 | Trogramming Style, Refinement of Coding - Time-S Linear Data Structures eue, Linked list and its types, Various Representation ures. Basic Non-Linear Data Structures c, Threaded Binary Tree, Binary Search Tree, B & B+ Tr Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (sease) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures n, Binary Search, Comparison Trees, Breadth First Search, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide and Conquer Sort, Merge Sort, Quert, Shell Sort, Divide Sort, Merge Sort, Quert, Shell Sort, Divide Sort, Merge Sort, Quert, Shell Sort, Divide Sort, Merge Sort, Quert, Sort, Merge Sort, Quert, Shell Sort, Divide Sort, Merge Sort, Quert, Sort, Sort | Space Tra s, Operati ee, AVL T arch and tr rch, Depth uick Sort, 1 | de Off, | Testing, Data 4 hour Applications of 5 hour algorithms and 5 hour arch, Insertion rt, Introduction 3 hour |





| Mod | dule:8 | Contemporary Issues | | 2 hours |
|------|---------------|--|---------------------|-------------------|
| Gue | st lecture by | / Industry Experts or R&D organization | 1 | |
| | | To | tal Lecture hours: | 30 hours |
| Tex | t Book(s) | | 1 | |
| 1. | E Horowi | tz and S Sahni, "Fundamentals of Data Structures", Se | cond Edition, Galge | otia Booksource, |
| | 2008. | | | |
| 2. | Alfred V. | . Aho, John E. Hopperoft, Jeffrey D. Ullman, "Data | a Structures and Al | gorithms", First |
| | | earson Publishers, 1983. | | |
| Refe | erence Boo | ks | | |
| 1. | Knuth Do | onald E, "Art of Computer Programming: Fundan | nental Algorithms | Volume 1 |
| | | ntal Algorithms", Third Edition, Pearson Publishers, | • | |
| 2 | | H. Cormen, Charles E. Leiserson, Ronald L. Rive | | "Introduction to |
| | | ns", Third Edition, PHI Publishers, 2009. | | |
| 3 | • | n, Open Data Structures: An Introduction (Open Pa | ths to Enriched Lea | arning), 31st ed. |
| - | | JBC Press, 2013. | | |
| Mo | | uation: CAT / Assignment / Quiz / FAT / Project | /Seminar | |
| 1110 | | | | |
| List | of Challen | ging Experiments (Indicative) | | |
| 1. | | f Hanoi using user defined stacks. | | |
| 2. | | writing, and addition of polynomials. | | |
| 3. | | ors with line count, word count showing on the screen. | | |
| 4. | | h all operations. | | |
| 5. | Graph alg | | | |
| 6. | | retrieving non-linear data structure in/from a file | | |
| | | | Laboratory Hours | 30 hours |
| Mod | le of Asses | sment: Assesments/ Mid Term Lab/ FAT / Proje | ect | |
| Rec | ommended | by Board of Studies 07.06.2019 | | |
| | | Academic Council No. 55 Date | 13.06.2019 | |



| Pre-requisite NIL Syllabus vers I. To provide knowledge on overview of IAS computer function and addressingmodes. 1. 2. Hardware and software implementation of arithmetic unit to solve addition, subtraction, multipli and division. 3. 3. To provide knowledge of memory technologies, interfacing techniques and sub system devices. Expected Course Outcome: 1. Provide fundamentals on machine instructions and addressing modes. 2. 2. Comprehend the various algorithms for computer arithmetic. 3. 3. Analyse the performance of various memory modules in memory hierarchy. 4. 4. Compare and contrast the features of L/O devices and parallel processors. 5. 5. Outline the evaluation of memory organization. 6. 6. Analyse the performance of Arithmetic logic unit, memory and CPU. Module:1 Module:1 Introduction to Computer Architecture 4 Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. 1. Instruction set architecture of a CPU: Registers, instruction execution cycle, RTL interpretat instructions, addressing modes, instruction set. Outlining instruction sets of some common CPUs. Module:2 Data representation 3 Signed number representation, fixed and floating-point representations, character representation. | J (| | L | Course Title | Course Code |
|---|-------------|----------------|----------------------|---|------------------------|
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| DMA, privileged and non-privileged instructions, software interrupts and exceptions. Program processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB. Module:6 Pipelining 4 | | interrupt dr | gram controlled, in | * | |
| Module:6 Pipelining 4 | | tions. Progr | rrupts and excepti | and non-privileged instructions, software | DMA, privileged an |
| | 4 hour | | | | |
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| to parallel processors, Concurrent access to memory and cache coherency. | | 10055015; IIII | | | |





| Mo | dule:7 | Memory organization | | | | 3 hours |
|--------------------------|---------------|---|----------------------|--------------|--------------------|------------------------------|
| Me | mory interl | eaving, concept of hierarchi | cal memory orga | nization, ca | che memory, cach | e size vs. block |
| | • | functions, replacement algorit | | | • | |
| | 11 0 | | , 1 | | | |
| Mo | dule:8 | Contemporary issues | | | | 1 hour |
| Gue | est lecture b | y Industry Experts or R&D | organization | | | |
| | | | | Total Leo | cture hours: | 30 hours |
| Tex | t Book(s) | | | | | |
| 1. | M. M. M | lano, Computer System Archi | itecture, 3rd ed., I | Prentice Hal | l of India, 1993. | |
| 2. | David A | A. Patterson and John L | . Hennessy, C | omputer C | Drganization and | Design: The |
| | Hardwar | e/Software Interface, 4th Edit | ion, Elsevier, 201 | 2. | C | C |
| 3. | Carl Ha | nacher, ZvonkoVranesic, Sat | fwatZaky, Naraig | Manjikian. | Computer Organiza | ation and |
| | | ed Systems, McGraw-Hill P | • | J / | 1 0 | |
| D | | | U, | | | |
| - | erence Bo | | | . M.C | 11:11 1000 | |
| 1. | | Hayes, Computer Architectur | 2 | | | |
| 2. | | Stallings, Computer Organiza | ation and Archited | cture: Desig | ning for Performan | ce, 8 th Edition, |
| | | Hall, 2006. | | | | |
| Mo | de of Eval | uation: CAT / Assignmen | t / Quiz / FAT / | Project / S | Seminar | |
| T :at | of Challer | - ain a From onion on ta (In dias | 4: | | | |
| $\frac{\text{List}}{1.}$ | | nging Experiments (Indica c Logic Unit | uve) | | | |
| $\frac{1}{2}$. | Memory | U | | | | |
| <u>2.</u> 3. | CPU Des | | | | | |
| <u> </u> | | ional Multipliers | | | | |
| •• | Comonia | | | Tatal Labo | ratory Hours | 30 hours |
| Mod | le of Asses | ssment: Assessments/ Mid | | | v | 30 11001 5 |
| | | d by Board of Studies | 16-09-2019 | | · | |
| Rec | | | | | | |



VIT® ore Institute of Technol

CURRICULUM (2022 - 2023)

| Course code | Course Title | L | Т | Р | J | C |
|---|--|-------------------------------------|--------------------------------|--|--|---------------------------------------|
| CBS1005 | | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | Syll | | | | 1 |
| | | | V | . 1.0 | | |
| Course Objec | | | | | | |
| 1. To intr | oduce the fundamental concepts of Software development process. | | | | | |
| 2. To teac | h the concepts of system analysis and design for system requirement | nt sp | ecif | icatio | on | |
| 3. To intro | oduce the principles of Coding, Testing, documentation, and projec | et Ma | anag | geme | nt | |
| | | | | | | |
| - | rse Outcome: | | | | | |
| | he system development life cycle for any Business system. | | | | | |
| | h software project management activities such as planning, schedul tion for the business system. | ling | and | | | |
| 3. Specify | the business requirements through appropriate system analysis and | desi | ign. | | | |
| 4. Adapt | good programming and documentation standards | | | | | |
| 5. Implem | ent and demonstrate any business system software from specification | on to | o va | lidat | ion | |
| and ver | ification. | | | | | |
| | | | | | | |
| | ntroduction | | | | hou | |
| | n the small vs. programming in the large; software project failures | | | - | | |
| - | and timely availability; of software engineering towards successfu | | | | | - |
| | ts; emergence of software engineering as a discipline, Software Eng | ginee | ering | g His | toric | al |
| Development f | com Jackson Structured Programming to Agile Development. | | | | | |
| | oftware Project Management | | | 4 | hou | rs |
| Module:2 S | | | | | | |
| | of life cycle models – different models and milestones; software | pro | iect | | | > |
| Basic concepts | of life cycle models – different models and milestones; software of activities and resources; concepts of feasibility study; technique | • • | <i>.</i> | - | tion | of |
| Basic concepts | of activities and resources; concepts of feasibility study; technique | es fo | or es | tima | | |
| Basic concepts identification of schedule and | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft | es fo twar | ores ree | tima ngin | eeri | ng |
| Basic concepts identification of schedule and economics; teo | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft hniques of software project control and reporting; introduction t | es fo twar to m | or es re e leasi | tima ngin urem | eeri nent | ng |
| Basic concepts identification of schedule and economics; teo | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft | es fo twar to m | or es re e leasi | tima ngin urem | eeri nent | ng |
| Basic concepts identification of schedule and economics; teo software size; i | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft hniques of software project control and reporting; introduction t | es fo twar to m | or es re e leasi | tima ngin urem emen | eeri nent | ng of |
| Basic concepts identification of schedule and economics; teo software size; i Module:3 S | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft hniques of software project control and reporting; introduction to ntroduction to the concepts of risk and its mitigation; configuration | es fo twar to m man | or es re e neasi nage | tima ngin urem emen 4 | eeri nent nt. hou | ng of |
| Basic concepts identification of schedule and economics; teo software size; i Module:3 Software qual | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft chniques of software project control and reporting; introduction to introduction to the concepts of risk and its mitigation; configuration oftware Quality Management and Reliability | es fo twar to m man 126 | re e neasi nage | tima ngin urem emen 4 llity | eeri ient it. hou facto | ng of I rs |
| Basic concepts identification of schedule and economics; teo software size; i Module:3 S Software qual Software Qua | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft hniques of software project control and reporting; introduction to ntroduction to the concepts of risk and its mitigation; configuration oftware Quality Management and Reliability ty; Garvin's quality dimensions, McCall's quality factor, ISO 9 | es fo twar to m man 126 | re e neasi nage | tima ngin urem emen 4 llity | eeri ient it. hou facto | ng of |
| Basic concepts identification of schedule and economics; tec software size; i Module:3 S Software qual Software Qua Introduction to | of activities and resources; concepts of feasibility study; technique effort; software cost estimation models and concepts of soft chniques of software project control and reporting; introduction to introduction to the concepts of risk and its mitigation; configuration oftware Quality Management and Reliability ty; Garvin's quality dimensions, McCall's quality factor, ISO 9 ity Dilemma; Introduction to Capability Maturity Models (Cl | es fo twar to m man 126 | re e neasi nage | tima ngin urem emen 4 llity d Cl | eeri ient it. hou facto | ng of u rs or; I); |

 Module:4
 Software Requirements Analysis, Design and Construction
 4 nours

 Introduction to Software Requirements Specifications (SRS) and requirement elicitation techniques; techniques for requirement modelling – decision tables, event tables, state transition tables, Petri nets; requirements documentation through use cases; introduction to UML, introduction to software metrics and metrics-based control methods; measures of code and design quality.





| | Object Oriented Analysis, Design and Construction | 4 hours |
|--|--|---|
| Concepts -t | he principles of abstraction, modularity, specification, encapsulation | and information |
| hiding; con | cepts of abstract data type; Class Responsibility Collaborator (CRC) n | nodel; quality of |
| design; desi | gn measurements; concepts of design patterns; Refactoring; object-orien | nted construction |
| principles; c | bject-oriented metrics. | |
| | | |
| Module:6 | Software Testing | 4 hours |
| Introduction | n to faults and failures; basic testing concepts; concepts of verification | n and validation; |
| black box a | nd white box tests; white box test coverage – code coverage, condition of | coverage, branch |
| coverage; ba | asic concepts of black-box tests - equivalence classes, boundary value tes | sts, usage of state |
| tables; testir | ng use cases; transaction based testing; testing for non-functional require | ements – volume, |
| performanc | e and efficiency; concepts of inspection; Unit Testing, Integration ' | Testing, System |
| Testing and | Acceptance Testing. | |
| | | |
| Module:7 | Agile Software Engineering | 4 hours |
| Agile Softv | vare Engineering: Concepts of Agile Methods, Extreme Programming | g; Agile Process |
| e | rum, Feature; Scenarios and Stories. | |
| | | |
| Module:8 | Contemporary Issues | 2 hours |
| | re by Industry Experts or R&D organization | 2 1100115 |
| | Total Lecture hours: | 30 hours |
| Text Book | | 50 110015 |
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| I I KOGET | N Pressman Nottware engineering, a practitioner's approach Palgrave n | nacmillan 7th |
| | S. Pressman, Software engineering: a practitioner's approach, Palgrave n 2017 | nacmillan, 7 th |
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| Edition Reference 1. The Es Ivar Jac | a, 2017. Books Issentials of Modern Software Engineering: Free the Practices from the cobson, Harold "Bud" Lawson, Pan-Wei Ng, Paul E. McMahon and Mich | Method Prisons, hael Goedicke |
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| CBS1006 | Course Title L | Τ | P | J | С |
|--|---|--|--|---|---|
| | Principles of Operating Systems 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | Sylla | | | n |
| Course Objectives: | | | v. 1.(|) | |
| | Operating system concepts and designs to provide the skills re | onired | l to ir | nnlei | nent |
| the OS services. | operating system concepts and designs to provide the skins re | quirec | <i>*</i> to n | npier | ment |
| | ade-offs between contradictory objectives in large scale OS syste | em des | ign. | | |
| | owledge for application of the various OS design issues and ser | | -8 | | |
| r i i i i i i i i i i i i i i i i i i i | | | | | |
| Expected Course Ou | tcome: | | | | |
| 1. Describe the varie | ous OS functionalities, structures and layers. | | | | |
| | calls related to OS management and interpreting different stag | es of v | ariou | is pro | ocess |
| states. | duling algorithms to most and validate the scheduling arithms | | | | |
| • | duling algorithms to meet and validate the scheduling criteria. e the communication between inter process and synchronization | taahn | ianas | | |
| | ry placement strategies, replacement algorithms related to main | | - | | rtual |
| 5. Implement memory techniqu | | 1 mem | ory a | nu vi | ituai |
| • 1 | ile systems; file allocation, access techniques along with virtua | lizatio | n con | cents | and |
| | vith protection and security enabled capabilities. | IIZatio | | cepts | anu |
| designing of ob v | the protocolon and security endoled capacitates. | | | | |
| Module:1 Intro | duction to OS and System Structure | | | 3 h | ours |
| Introduction: Conce | pt of Operating Systems (OS), Generations of OS, Types of | of OS, | OS | Serv | ices, |
| | System Calls, Basic architectural concepts of an OS, Concept | t of Vi | rtual | Mac | |
| | | | | | hine, |
| Resource Manager vie | ew, process view and hierarchical view of an OS. | | | | hine, |
| | | | | | |
| Module:2 Proce | ess Management and Scheduling Algorithms | | | 6 h | ours |
| Module:2 Proce Processes: Definition | ess Management and Scheduling Algorithms a, Process Relationship, Different states of a Process, Proce | ess Sta | ate tr | 6 h ansit | ours |
| Module:2ProceProcesses:DefinitionProcessControlBloc | ess Management and Scheduling Algorithms a, Process Relationship, Different states of a Process, Proce k (PCB), Context switching. Process Scheduling : Founda | ess Sta tion a | ate tr | 6 h ansit | ours ions, ıling |
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VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Module:4 | Memory Management | 6 hours |
|--|--|----------------------------------|
| Memory Ma | nagement: Basic concept, Logical and Physical address maps, Me | emory allocation: |
| Contiguous M | emory allocation – Fixed and variable partition– Internal and External f | fragmentation and |
| Compaction. | irtual Memory : Basics of Virtual Memory – Hardware and control struct | tures – Locality of |
| reference, Page | allocation, Partitioning, Paging, Page fault, Working Set, Segmentation, Der | mand paging, Page |
| - | llgorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not re- | |
| - | ently used (LRU). | • • • |
| Module:5 | File Systems Management and Implementation | 2 hours |
| File Manager | nent: Concept of File, Access methods, File types, File operation, Direct | ory structure, File |
| System struct | re, Allocation methods (contiguous, linked, indexed), Free-space manag | ement (bit vector, |
| linked list, gro | uping), directory implementation (linear list, hash table), efficiency and perf | ormance. |
| | | |
| Module:6 | I/O and Device Management | 2 hours |
| I/O Hardwa | re: I/O devices, Device controllers, Direct Memory Access, Principle | es of I/O. Disk |
| - | : Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk | k reliability, Disk |
| formatting, Bo | ot-block, Bad blocks. | |
| | | |
| Module:7 | Case Study | 2 hours |
| UNIX system | UNIX OS file system, shell, filters, shell programming, programming with calls. | the standard I/O, |
| Module:8 | Contemporary Issues | 2 hours |
| | by Industry Experts or R&D organization | _ 11041 5 |
| | Total Lecture hours: | 30 hours |
| Text Book(s) | | |
| 1. Abrahan 2019. | n Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, W | Viley, 10 th Edition, |
| 2. Tanenba | um, Andrew S., and Albert S. Woodhull. Operating systems: design and | d implementation. |
| | Englewood Cliffs: Prentice Hall, 1997. | • |
| Reference Bo | ok(s) | |
| | H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating Syste rpaci-Dusseau Books, Inc, 2015. | ms, Three Easy |
| | ere, Dhananjay M. Operating systems: a concept-based approach, 2E. T | Tata McGraw-Hill |
| Educatio | | |
| 3. Deitel, | Harvey M., Paul J. Deitel, and David R. Choffnes. Operating systems | s. Delhi. Pearson |
| | n: Dorling Kindersley, 2004. | |
| Luucall | | |
| | | 57. |
| 4. Milenko | vič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 198 | 7. |
| 4. Milenko | | 7. |
| 4. Milenko Mode of Eva | vič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 198 | 7. |
| 4. Milenko Mode of Eva List of Challe | vič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 198 Iuation: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| 4.MilenkoMode of EvaList of Challe1.Study of | vič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 198 Iuation: CAT / Assignment / Quiz / FAT / Project / Seminar enging Experiments (Indicative) | |
| 4. Milenko Mode of Eva List of Challe 1. Study of and Scri | vič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 198 Iuation: CAT / Assignment / Quiz / FAT / Project / Seminar enging Experiments (Indicative) Linux commands – System Information, Files and Directories, Process, Te | |





B. Tech Computer Science and Engineering and Business Systems

| 4. | CPU Scheduling Algorithms (FCFS, S | JF, RR, Priori | ty) | |
|-----|---|-------------------|-----------------|--------------------------------|
| 5. | Deadlock Avoidance Algorithm (Banl | kers algorithm) | | |
| 6. | IPC (Threads, Pipes) | | | |
| 7. | Process synchronization (Producer C semaphores) | onsumer / Rea | der Writer/Di | ning Philosopher using |
| 8. | Dynamic Memory Allocation Algorith | nms (First fit, I | Best fit, Worst | fit) |
| 9. | Page Replacement Algorithms. (FIFO | , LRU, Optim | al) | |
| 10. | Disk Scheduling Algorithms. | | | |
| | · | | To | tal Laboratory Hours: 30 hours |
| Mod | le of Assessment: Assessments/ Mi | d Term Lab/ | FAT / Proje | ct |
| Rec | ommended by Board of Studies | 16-09-2020 | | |
| App | proved by Academic Council | No. 59 | Date | 24-09-2020 |



B. Tech Computer Science and Engineering and Business Systems

| Course Code | Course Title | L | Т | Р | J | С |
|---------------|------------------|------------------|---|--------|---|---|
| CBS1007 | Database Systems | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | Syllabus version | | | n | |
| | | | | v. 1.(|) | |

Course Objectives:

1. To teach and acquaint students the significance of Database design and ER Modelling.

2. To acquaint the students with concepts of good database design and normalization of relational schemas.

3. To teach students the different concurrency control and recovery techniques for transactions.

Expected Course Outcome:

1. Acquire a good understanding of the architecture and functioning of database management systems.

- 2. Ability to construct an ER model and derive the relational schemas from the model.
- 3. Analyse and apply the principles and practices of good database design.
- 4. Use the concepts of data normalization to analyse, measure and evaluate the performance of a database application.
- 5. Ability to grant and revoke privileges and comprehend database recovery techniques.
- 6. Construct efficient SQL queries to retrieve and manipulate data as required.

Module:1 Introduction

Introduction: Introduction to Database. Hierarchical, Network and Relational Models. Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

Module:2 Data Models

Entity-relationship model, network model, relational and object-oriented data models, integrity constraints, data manipulation operations.

| Module:3 | Relational database design and Query languages | 6 hours |
|-----------------|---|-----------------------|
| Relational data | base design: Domain and data dependency, Armstrong's axioms, Fund | ctional Dependencies, |

Normal forms, Dependency preservation, Lossless design.

Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

Module:4Query processing and Optimization4 hoursEvaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization
algorithms.4 hours

Module:5 Transaction Processing

Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp-based schedulers, multi-version and optimistic Concurrency Control schemes, Database recovery.

Module:6 Database Security

Storage strategies: Indices, B-trees, Hashing. Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.

3 hours

4 hours

6 hours

4 hours





| | ule:7 | Advanced Topics | 2 hours |
|------|----------------------|---|----------------------------------|
| | | l and object relational databases, Logical databases, Web databases, E | Distributed databases, |
| Data | warehousi | ng and data mining. | |
| Mod | ule:8 | Contemporary Issues | 1 Hour |
| | | y Industry Experts or R&D organization | 1 11001 |
| Oues | | Total Lecture hours: | 30 hours |
| Mod | le of Eval | uation: CAT / Assignment / Quiz / FAT / Project / Seminar | 50 110013 |
| | Book(s) | | |
| 1. | () | hatz, A., Korth, H. F., and Sudarshan, S. Database System Concep 2019. | ts, McGraw-Hill, 7 th |
| 2. | 2012. | P. Data warehousing fundamentals for IT professionals. John Wiley | |
| 3. | | A., & Smith, S. J. Data warehousing, data mining, and OLAP. McGraw- | |
| 4. | | R., &Navathe, S. B. Fundamentals of database systems, 4th Editi | on, Addison Wesley |
| | | g Edition, 2017. | |
| | rence Bo | | |
| 1. | 0 | ar, A. K., and Bhattacharyya, P. Database Management Systems. McGra | |
| 2. | Raghu R | amakrishnan, Database Management Systems, Mcgraw-Hill,4th edition, | 2015 |
| List | of Challe | nging Experiments (Indicative) | |
| 1 | Data Def using SQ | inition Language, Data Manipulation Language and Data Control Lang L | uage commands |
| 2 | Create w | ith and without Constraint name | |
| 3 | | l Algebra – Select, Project, Union, Intersection, Set difference, Join, C | artesian Product |
| 4 | Normaliz | zation | |
| 5 | PL/SQL | | |
| 6 | SQL inje | ction | |
| 7 | Object or | iented and object relational databases | |
| | | Total Laboratory Hours: | 30 hours |
| | | ssment: Assessments/ Mid Term Lab/ FAT / Project | |
| | | d by Board of Studies 16-09-2020 | |
| Арри | roved by A | Academic CouncilNo. 59Date24-09-2020 | |





| Course Code | | Course Title | L | Т | P | J | C |
|---|---|--|-------------|-----------------------------|---------|--|---|
| CBS1008 | | Operations Research | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | | NIL | | Syllab | us Ve | ersior | 1 |
| | | | | | v. 1.0 | | |
| Course Objec | | | | | | | |
| The course is a | | | | | | | |
| | - | tes the application of Operations Research for solv | ing Engine | eering | proble | ems. | |
| | | ning, purpose, and tools of Operations Research. | | | | | |
| • | • | problem, identify, formulate and solve problems | s in any ei | nginee | ring f | ield u | ising |
| - | - | principles, considering current and future trends. | | | | | |
| | | ected to know and understand common and impor | | | | | |
| | | p problem modeling and solving skills and learn h | ow to mak | ke intel | ligent | decis | sions |
| | | iew of optimization. | | | | | |
| 6. The studen | nts will use | e optimization techniques to enhance systems and | l to manag | ge ente | rprise | resou | irces |
| using curre | ent tools, f | rameworks and reusable resources. | | | | | |
| | | | | | | | |
| Expected Co | | | | | | | |
| At the end of t | the course, | the student will be able to | | | | | |
| 1. Apply ope | rations res | earch techniques like L.P.P, scheduling and seque | encing in i | industr | ial op | timiza | atior |
| problems. | | | | | | | |
| | | | | | | | |
| 2. Solve alloc | cation prob | elems using various OR methods. | | | | | |
| | 1 | olems using various OR methods. models like Inventory, Replacement, Queuing, D | ecision et | c., and | l apply | y then | n fo |
| | arious OR | C | ecision et | c., and | l apply | y then | n fo |
| 3. Analyze v optimizati | arious OR on. | C | ecision et | c., and | l apply | y then | n fo |
| Analyze v optimizati Understand | arious OR on. d the conce | models like Inventory, Replacement, Queuing, D | | | | | |
| Analyze v optimizati Understand | arious OR on. d the conce vledge on e | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operation | | | | | |
| Analyze v optimizati Understand Gain know application | arious OR on. d the conce vledge on e ns in indus | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. | | | | e rang | ge of |
| Analyze v optimizati Understand Gain know application Module:1 | arious OR on. d the conce vledge on e ns in indus Linear | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. | ons Resea | arch in | a wid | e ranş | ge of |
| Analyze v optimizati Understand Gain know application Module:1 | arious OR on. d the conce vledge on o ns in indus Linear and scop | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. • Programming Problems • of Operations Research and Introduction to | ons Resea | arch in | a wid | e rang 7 h | ge of our: P) |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of | arious OR on. d the conce vledge on o ns in indus Linear and scop LP Proble | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. • Programming Problems be of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra | ons Resea | arch in Progra | a wid | e rang 7 h ng (L ving L | ge of ours P) PP |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth | arious OR on. d the conce vledge on o ns in indus <u>Linear</u> and scop LP Proble | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. • Programming Problems be of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra boundedness - Multiple Optimum Solutions - Dege | ons Resea | arch in Progra | a wid | e rang 7 h ng (L ving L | ge of ours P) |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth | arious OR on. d the conce vledge on o ns in indus <u>Linear</u> and scop LP Proble | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. • Programming Problems be of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra | ons Resea | arch in Progra | a wid | e rang 7 h ng (L ving L | ge of ours P) |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth Artificial Varia | arious OR on. d the conce vledge on o ns in indus Linear and scop LP Proble nod – Unbo ables : Big- | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operatis stries. • Programming Problems • of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra boundedness - Multiple Optimum Solutions - Dege M Method - Sensitivity Analysis. | ons Resea | arch in Progra | a wid | e rang 7 h ng (L ving L proble | ge of ours P) PP ms |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth Artificial Varia Module:2 | arious OR on. d the conce vledge on o ns in indus Linear and scop LP Proble od – Unbo ables : Big- | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operati stries. • Programming Problems be of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra bundedness - Multiple Optimum Solutions - Dege M Method - Sensitivity Analysis. | ons Resea | Progra ethod o nd Cyc | a wid | e rang 7 h ng (L ving L Proble 5 h | ours ours P) - PP - pms - |
| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth Artificial Varia Module:2 Formulation of | arious OR on. d the conce vledge on o ns in indus Linear and scop LP Proble od – Unbo ables : Big- | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operatis stries. • Programming Problems • of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra boundedness - Multiple Optimum Solutions - Dege M Method - Sensitivity Analysis. | ons Resea | Progra ethod o nd Cyc | a wid | e rang 7 h ng (L ving L Proble 5 h | ge of our P) PP oms |
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| Analyze v optimizati Understand Gain know application Module:1 An overview Illustration of Simplex Meth Artificial Varia Module:2 Formulation of Problems. Module:3 Formulation, O Module:4 Single and Mu | arious OR on. d the conce vledge on o ns in indus Linear and scop LP Proble nod – Unbe ables : Big- of Transpo Specia of Transpo Intege Cutting Pla | models like Inventory, Replacement, Queuing, D epts of integer linear programming. current topics and advanced techniques of Operatis stries. • Programming Problems be of Operations Research and Introduction to ems - Formulation exercises on LP Problems - Gra bundedness - Multiple Optimum Solutions - Dege M Method - Sensitivity Analysis. • Types of Linear Programming Problems rtation Problems - Sensitivity Analysis in Transp • Programming Problems ne Method - Branch and Bound Method – Applica • Programming Problems I Programming Problems. | ons Resea | Progra ethod o nd Cyc | a wid | e rang 7 h ng (L ving I Proble 5 h ssigni 4 h | ge or our P) PP ms our our |
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VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Mod | lule:6 | Game Th | ieory | | | | | 5 hours |
|------|-------------|--------------|------------------|----------------|-------------|-------------|------------------------|------------|
| | | | | | | | o sum games - Pure | strategy - |
| Dom | inance theo | ory - Mixed | strategies - Alg | ebraic and gr | raphical | methods. | | |
| | | | | | | | | |
| | lule:7 | | porary issues | | | | | 2 hours |
| Indu | stry Exper | Lecture | | | | | | |
| | | | | T | ntel L pr | ture hour | | 30 hours |
| | | | | | | ture nour | 5 | 50 11001 5 |
| Text | Book(s) | | | | | | | |
| 1. | Kanti Sw | arup, Gupta | P.K., and Man | mohan, (2008 | 8), Opera | ations Reso | earch, S. Chand & sons | • |
| Refe | rence Boo | | | | // 1 | | | |
| 1. | Hamdy T | aha, (1999), | Operations Rea | search, PHI. | | | | |
| 2. | | | Operations Reso | | manth R | amnath & | Co. | |
| 3. | | | 1), Operations I | | | | | |
| 4. | | | 06), Operation | | | | a Pvt Ltd. | |
| | | | | ` | | | | |
| Mod | e of Evalu | ation : Digi | tal Assignments | s (Solutions l | by using | soft skills |), Continuous Assessme | ent Tests, |
| Quiz | , Final Ass | essment Tes | t. | | | | | |
| List | of Challer | iging Expe | riments (Indic | ative) | | | | |
| 1. | Introduct | ion to the s | oftware (R/LI | NGO/CPLEZ | X/any su | uitable sof | tware packages) and | 2 hours |
| | general S | yntaxes | | | | | | |
| 2. | Plotting a | nd visualizi | ng curves and s | urfaces – Syr | mbolic c | omputation | ns | 2 hours |
| 3. | Evaluatin | g LPP using | Simplex Metho | od | | | | 2 hours |
| 4. | Evaluatin | g LPP using | Big M Method | and Sensitiv | ity Anal | ysis | | 2 hours |
| 5. | Evaluatin | g Transport: | tion Problems | and Sensitivi | ity Analy | ysis in Tra | nsportation Problems | 2 hours |
| 6. | Evaluatin | g Assignme | nt Problems | | | | | 2 hours |
| 7. | Evaluatin | g Integer Pr | ogramming Pro | oblems | | | | 2 hours |
| 8. | Evaluatin | g problems | about transition | probabilities | s and ste | ady-state | probabilities | 2 hours |
| 9. | | | about Game the | | | • | | 2 hours |
| 10. | | | n techniques to | | roblems | | | 2 hours |
| | 11 0 | | | 1 | | Tota | al Laboratory Hours | 20 hours |
| | | | | | | | ~ | |
| | | | ekly Assessme | , | | ent Test | | |
| | | l by Board | | 16-09-20 | 020 | | | |
| App | roved by A | Academic C | ouncil | No. 59 | | Date | 24-09-2020 | |





| Course Code | Course Title L | Τ | Р | J | С |
|---|--|-----------------------------------|------------|---|--|
| CBS1009 | Computational Statistics 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL Syl | llabu | | | 1 |
| | | | v. 1. | 0 | |
| Course Objectives | | | T | 11 | 1 |
| | oduce and understand modern computational methods used in stati | | | | |
| | mulation, estimation and visualization of statistical data. Unde | rstan | d th | le re | oleo |
| * | a tool of discovery in data analysis. | | | | |
| | e students to understand and use the applications of statistics in the re | | - | | |
| | course is to give graduate students a solid foundation of computation | | | | |
| - | other courses and their research. This course introduces some comp | | | | |
| | emphasis on the usage of statistical software packages, statistical sin | nulati | on, r | ume | rica |
| methods, and re- | lated topics. | | | | |
| | | | | | |
| Expected Course | | | | | |
| | e course the student should be able to: | | | | |
| • | erpret statistical data using multivariate normal distributions. | | | | |
| | aches to point estimation of parameters. | | | | |
| | concept of multivariate regression, by using multivariate analysi | is and | d int | erpro | eting |
| experimental da | | | | | |
| | concept of statistical analysis. | | | | |
| 6. Learn about the | data aggregation, group operations and time series. | | | | |
| Module:1 N | | | | | |
| | Jultivariate Normal Distribution | | | 5 h | our |
| | Iultivariate Normal Distribution | orem | ressi | | our |
| Multivariate Norma | al Distribution Functions - Conditional Distribution and its relation to | o reg | ressi | | |
| Multivariate Norma | al Distribution Functions - Conditional Distribution and its relation to | o reg | ressi | | |
| Multivariate Norma - Estimation of para | al Distribution Functions - Conditional Distribution and its relation to meters. | o reg | ressi | on m | ode |
| Multivariate Norma - Estimation of para Module:2 N | al Distribution Functions - Conditional Distribution and its relation to meters. Jultiple Linear Regression Model | | | on m 5 h | our |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple re | al Distribution Functions - Conditional Distribution and its relation to imeters. Iultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie | | | on m 5 h | our |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple re | al Distribution Functions - Conditional Distribution and its relation to meters. Jultiple Linear Regression Model | | | on m 5 h | our |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple re and autocorrelation | al Distribution Functions - Conditional Distribution and its relation to imeters. Iultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie | | | on m 5 h 10rm | ode |
| Multivariate Norma - Estimation of para Module:2 N Standard multiple re and autocorrelation Module:3 N | al Distribution Functions - Conditional Distribution and its relation to imeters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. | ers - r | 10n-1 | on m 5 h horm 4 h | our our our |
| Multivariate Norma - Estimation of para Module:2 N Standard multiple re and autocorrelation Module:3 N | Al Distribution Functions - Conditional Distribution and its relation to meters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression | ers - r | 10n-1 | on m 5 h horm 4 h | our nalit |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple reand autocorrelation Module:3 M Assumptions of Multiple readed | Al Distribution Functions - Conditional Distribution and its relation to meters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression | ers - r | 10n-1 | on m 5 h horm 4 h | our our our |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple re and autocorrelation Module:3 M Assumptions of Mu and covariance. | Al Distribution Functions - Conditional Distribution and its relation to meters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression | ers - r | 10n-1 | on m 5 h horm 4 h vari | our alit our ance |
| Multivariate Norma - Estimation of para Module:2 N Standard multiple read and autocorrelation Module:3 N Assumptions of Multiple read and covariance. Module:4 D | al Distribution Functions - Conditional Distribution and its relation to ameters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression Itivariate Regression Models - Parameter estimation - Multivariate A | ers - r nalys | is of | on m 5 h norm 4 h vari 4 h | our our aalit ance our |
| Multivariate Norma - Estimation of para Module:2 M Standard multiple reand autocorrelation Module:3 M Assumptions of Mu and covariance. Module:4 D Statistical background | Al Distribution Functions - Conditional Distribution and its relation to meters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression Itivariate Regression Models - Parameter estimation - Multivariate A Discriminant Analysis and Principal Component Analysis | ers - r nalys | is of | on m 5 h norm 4 h vari 4 h | our our aalit ance |
| Multivariate Norma - Estimation of para Module:2 N Standard multiple read and autocorrelation Module:3 N Assumptions of Multiple read and covariance. Module:4 D Statistical background their properties. | Al Distribution Functions - Conditional Distribution and its relation to meters. fultiple Linear Regression Model egression models with emphasis on detection of collinearity – outlie - Validation of model assumptions. fultivariate Regression Itivariate Regression Models - Parameter estimation - Multivariate A Discriminant Analysis and Principal Component Analysis | ers - r nalys | non-1 | on m 5 h norm 4 h vari 4 h | our aalit aance our aance |
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CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems Introduction - Types of clustering - Correlations and distances - clustering by partitioning methods hierarchical clustering - overlapping clustering - K-Means Clustering-Profiling and Interpreting Clusters. Module:6 Data Aggregation, Group Operations and Time series 5 hours GoupBy Mechanics - Data Aggregation - Group wise Operations and Transformations - Pivot Tables and Cross Tabulations - Time Series Basics - Data Ranges - Frequencies and Shifting. Module:7 **Contemporary Issues** 2 hours Industry Expert Lecture **Total Lecture hours:** 30 hours **Text Book(s)** Applied Multivariate Statistical Analysis, (2007), Richard A. Johnson, Dean W. Wichern, Pearson 1. Prentice Hall. An Introduction to Multivariate Statistical Analysis, (2003), T.W. Anderson, John Wiley, N.Y. 2. Mark Lutz, "Programming Python", O'Reilly Media, 4th edition, 2010. 3. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Apress, Second Edition, 4. 2005. **Reference Books** Regression Diagnostics, Identifying Influential Data and Sources of Collinearety, (1980), D.A. 1. Belsey, E. Kuh and R.E. Welsch Applied Linear Regression Models, (1989), J. Neter, W. Wasserman and M.H. Kutner, Homewood, 2. Illinois. 3. The Foundations of Factor Analysis, (1972), A.S. Mulaik, McGraw Hill, N.Y. 4. Introduction to Linear Regression Analysis, (2012), D.C. Montgomery and E.A. Peck, John Wiley, N.Y. Cluster analysis for Applications, (1973), M.R. Anderberg, Academic Press, N.Y. 5. Multivariate Statistical Analysis, (1990), D.F. Morrison, McGraw Hill, N.Y. 6. Python for Data Analysis, (2013), Wes Mc Kinney, O'Reilly Media, 2012. 7. Mode of Evaluation : Digital Assignments, Continuous Assessments, Final Assessment Test List of Challenging Experiments (Indicative) Introduction to Python – Keywords, identifiers, I/O statements. 1. 2 hours Sequence and File operations, Functions, loops, Modules, errors and exceptions. 2 hours 2. Data Manipulation- Basic Functionalities, Merging, Concatenation of data objects, 3. 2 hours Exploring a Dataset and Analyzing a dataset. Data visualization – Matplotlib package, Plotting Graphs, Controlling Graph, Adding 4 2 hours Text, More Graph Types, Getting and setting values, Patches. 5 Python Concepts, Data Structures - Interpreter, Program Execution, Statements, 2 hours Expressions, Flow Controls, Functions.

 Expressions, Flow Controls, Functions.

 6.
 Numeric Types, Sequences and Class Definition, Constructors, Text & Binary Files –
 2 hours

 Reading and Writing
 2

 7
 Data Wrangling: Combining and Merging Datasets, Reshaping and Pivoting, Data
 2 hours





| | Total Laboratory Hours | 20 hours |
|----|---|----------|
| | Analysis. | |
| 10 | Model Sampling from multivariate normal distribution; MANOVA; Discriminant | 2 hours |
| 9 | Factor Analysis and Cluster Analysis. | 2 hours |
| | Analysis. | |
| 8 | Multivariate Analysis: Graphical representation of multivariate data; Principal Component | 2 hours |
| | Transformation, String Manipulation, Regular Expressions | |

| Mode of Evaluation : Weekly Assessment | s, Final Assessment | t Test | |
|--|---------------------|--------|------------|
| Recommended by Board of Studies | 16-09-2020 | | |
| Approved by Academic Council | No. 59 | Date | 24-09-2020 |



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CURRICULUM (2022 - 2023)

| Course Cod | e | Course Title L | I | P | J | U |
|--|---|--|---|---|---|---|
| CBS2002 | | Formal Language and Automata Theory3 | 0 | 0 | 0 | 3 |
| Pre-requisit | e NIL | Syl | labus | | ion | |
| | | | V | . 1.0 | | |
| Course Objectives | | | | | | |
| - | - | l methods and languages | | | | |
| 2. Distinguish dif | erent comput | ing models and classify their respective types | | | | |
| 3. Show a compet | ent understar | ding of the basic concepts of complexity theory | | | | |
| Expected Course | Outcome: | | | | | |
| . | he knowledg | e of mathematical models of computation and describe ho | ow the | eyrela | ite to |) |
| 2. Derive an app | ropriate mode | el of computation for a given language and vice versa. | | | | |
| 3. Infer the equi | valence of lan | guages described using different automata or grammars. | | | | |
| 4. Distinguish th | e computabil | ty power of automata and their limitations | | | | |
| Madulaa1 | Intro du otio | | | | 5 h | |
| Module:1 | Introductio | | | | 5 h | Jul |
| Alphabet, languag | es and gramm | ars, productions and derivation, Chomsky hierarchy of lan | iguage | es. | | |
| Module:2 | | | | | | |
| Iviouuic. | Regular lar | guages and finite automata | | | 8 h |)UI |
| Regular expression | ons and langu | guages and finite automata ages, deterministic finite automata (DFA) and equival finite automata (NFA) and equivalence with DFA, regu | | | regu | ıla |
| Regular expression expressions, none equivalence with | ns and langueterministic | ages, deterministic finite automata (DFA) and equival | lar gr | amm | regu ars a | ilai anc |
| Regular expression expressions, none equivalence with | ns and langu eterministic inite automa Myhill-Neroo | ages, deterministic finite automata (DFA) and equival finite automata (NFA) and equivalence with DFA, regu ta, properties of regular languages, Kleene's theorem, pu | lar gr | amm | regu ars a | ilan anc foi |
| Regular expression expressions, none equivalence with regular languages, Module:3 | ns and langueterministic inite automa Myhill-Neroe Context-fre | ages, deterministic finite automata (DFA) and equival finite automata (NFA) and equivalence with DFA, regu ta, properties of regular languages, Kleene's theorem, pu le theorem and its uses, minimization of finite automata. | lar gr Impin | amm g len | regu ars a nma 7 ho | ilan anc foi |
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| Regular expression expressions, none equivalence with regular languages, Module:3 Context-free gra nondeterministic pumping lemma for Module:4 Context-sensitive Module:5 The basic model decidable (recursit | ons and langueterministic finite automa Myhill-Nerod Context-free mmars (CFC pushdown autor context-free oushdown autor context-free grammars (CS Turing material for Turing material for Turing material for Turing material for Turing material | ages, deterministic finite automata (DFA) and equival finite automata (NFA) and equivalence with DFA, regular, properties of regular languages, Kleene's theorem, puble theorem and its uses, minimization of finite automata. ce languages and pushdown automata G) and languages (CFL), Chomsky and Greibach tomata (PDA) and equivalence with CFG, parse trees, a e languages, deterministic pushdown automata, closure properties and languages linear bounded automata and equivaler chines achines (TM), Turing recognizable (recursively enumer and their closure properties, variants of Turing machines | lar gr impin impin i nor mbigu opertio oce wi ace wi ace wi s, non | amm g len mal uity i es of th CS and deter | regu nars a nma 7 ho fori n CFL 4 ho SG. 7 ho Turii mini | our and for for ms, FG, .s. our ng. stic |
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| 1110 | dule:7 | Basic Introduction to Co | omplexity | | | 6 hours |
|------------------------------|--|---|--|---------------------------|--------------------------------|-----------------|
| Intr | oductory ide | eas on Time complexity of de | eterministic and nor | ndetermini | stic Turing mach | ines, P and |
| NP, | NP- comple | teness, Cook's Theorem, othe | er NP -Complete p | roblems. | | |
| Mo | dule:8 | Contomnorow Igguag | | | | 2 hours |
| | | Contemporary Issues | rganization | | | 2 1100115 |
| Gue | | industry Experts of ReeD of | - | Total Lect | ure hours: | 45 hours |
| Tex | t Book(s) | | | | | |
| 1. | Hopcroft, | John E., Rajeev Motwani, | and Jeffrey D. Ul | lman. Intro | duction to Auto | omata Theory, |
| | Languages | s, and Computation, Pearson H | Education, 3rd Edition | on, 2013. | | |
| 2. | Martin, J. | C. Introduction to Language | s and the Theory of | Computat | ion. New York: I | McGraw-Hill. |
| 1 | | | | | | |
| l | 4 th Edition | a, 2007. | | | | , |
| Refe | 4 th Edition | , | | | | |
| Refe 1. | rence Book | , | H. Elements of the | Theory of | Computation. P | |
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| | rence Book Lewis, H. India Priva | (s) R., and Papadimitriou, C. H | | | | rentice Hall of |
| 1. | rence Book Lewis, H. India Priva Dexter C. | (s) R., and Papadimitriou, C. H ate Limited, 2015. Kozen. Automata and comput | ability. Springer Sc | ience & Bu | siness Media, 20 | rentice Hall of |
| 1. 2. 3. | rence Book Lewis, H. India Priva Dexter C. Sipser, M. | (s) R., and Papadimitriou, C. F ate Limited, 2015. Kozen. Automata and comput Introduction to the Theory of | ability. Springer Sc Computation. Cen | ience & Bu gage learni | usiness Media, 20 ng, 2012. | rentice Hall of |
| 1. 2. 3. Mod | rence Book Lewis, H. India Priva Dexter C. Sipser, M. e of Evalua | (s) R., and Papadimitriou, C. H ate Limited, 2015. Kozen. Automata and comput | ability. Springer Sc Computation. Cen | ience & Bu gage learni | usiness Media, 20 ng, 2012. | rentice Hall of |



VIIT® Vellore Institute of Technology (Deemed to be University under section & of Urge Art 1950)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | Τ | P | J | C |
|--|---|---|---|--|---|---|
| CBS2003 | Design Thinking | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | | Syl | labu | s ver | sio |
| | | | | v. 1. | 0 | |
| Course Objective | | | | | | |
| - | importance of design thinking and its various phases | | | | | |
| | hinking phases to create successful prototypes | | | | | |
| 3. Understand that | at both agile and design thinking process complement each other | • | | | | |
| Expected Course | Outcome: | | | | | |
| A | al completion of the course the student should be able to | | | | | |
| | e importance of design thinking and its different phases | | | | | |
| | h user situations and be able to define clear problem statements | | | | | |
| | ent ideation methods and come with different feasible and viable | ideas | for s | olvin | o the | , |
| problem stateme | | lucus | 101 5 | 01 1 11 | | |
| * | pes for clear understanding of the problem statement. | | | | | |
| 1 2 | ed prototypes and be able to iterate if the design does not meet the | 0.0110 | tomo | r roc | nira | nor |
| | | ccus | tome | rieq | unel | nef |
| o. Complement a | gile process with design thinking for efficient delivery process. | | | | | |
| Module:1 Int | roduction to Design Thinking | | | | 3 h | 0111 |
| | | | | | _ J II | vui |
| Importance of Des | ign Thinking – Phases in design thinking process – Five stage r | nodel | -Nc | n_li | | tvo |
| - | ign Thinking – Phases in design thinking process – Five stage r | node | - No | on-lii | | ty c |
| - | ign Thinking – Phases in design thinking process – Five stage r el – Applications of design thinking in various domains. | node | - No | on-lii | | ty c |
| the five-stage mode | el – Applications of design thinking in various domains. | node | - No | on-lii | neari | |
| the five-stage mode Module:2 En | el – Applications of design thinking in various domains. | | | | neari 4 h | our |
| the five-stage mode Module:2 En Empathy – Empat | el – Applications of design thinking in various domains. hpathize Phase hize with the users - Steps in empathize phase – Developing em | path | y tow | vards | neari 4 h peoj | our ple |
| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn | el – Applications of design thinking in various domains. Apathize Phase hize with the users - Steps in empathize phase – Developing em- her's mindset – Ask What? And Why? – Immersion Activity – Ste | path | y tow | vards | neari 4 h peoj | our ple |
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| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn - Body Storming – Module:3 De Define the proble perspectives on Pe | el – Applications of design thinking in various domains. Apathize Phase hize with the users - Steps in empathize phase – Developing em- liner's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per | path ps in sonas | y tow imme s – F agrar | vards ersion Four ns – | 4 h peop n act | our ple ivity our eren |
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| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn - Body Storming – Module:3 De Define the proble perspectives on Pe mapping – Point o Module:4 Ide What is ideation – brainstorming – M Doodling – Use of | el – Applications of design thinking in various domains. pathize Phase hize with the users - Steps in empathize phase – Developing em- ter's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per- rsonas – Steps to creating personas – Problem statement – Affin f View – "How might we" questions – Why-how laddering – C eate Need for ideation – Uses of ideation – Ideation Methods – Br find maps – Guidelines to create mind maps – Ideation game | ps in ps in sonas ity di ase st | y tow imme s – F agrar audies | Four rsion rour s. | 4 h peoj n act 5 h diffe Emp 6 h Rule ng Ha | our ple ivity our eren ath |
| the five-stage modeModule:2EnEmpathy – EmpathAssuming a beginn- Body Storming –Module:3DeDefine the probleperspectives on Pemapping – Point oModule:4IdeWhat is ideation –brainstorming – MDoodling – Use ofModule:5Pre | el – Applications of design thinking in various domains. pathize Phase hize with the users - Steps in empathize phase – Developing em- ter's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per- rsonas – Steps to creating personas – Problem statement – Affin f View – "How might we" questions – Why-how laddering – C eate Need for ideation – Uses of ideation – Ideation Methods – Br find maps – Guidelines to create mind maps – Ideation game f doodling in expressing creative ideas – Case studies. | ps in ps in sonas ity di ase st ainste s - Si | y tow immo s – F agrar audies | vards ersion Four ns – s. | 4 h peoj n act 5 h diffe Emp 6 h Rule ng H | our ole ivity our eren ath our s fc ats |
| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn - Body Storming – Module:3 De Define the proble perspectives on Pe mapping – Point o Module:4 Ide What is ideation – brainstorming – M Doodling – Use of Module:5 Pre Prototyping – Typ | el – Applications of design thinking in various domains. mpathize Phase hize with the users - Steps in empathize phase – Developing em- ter's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per- rsonas – Steps to creating personas – Problem statement – Affin f View – "How might we" questions – Why-how laddering – C eate Need for ideation – Uses of ideation – Ideation Methods – Br find maps – Guidelines to create mind maps – Ideation game F doodling in expressing creative ideas – Case studies. | pathy ps in sonas ity di ase st ainste s - Si | y tow immo s – F agrar agrar ormir x Th | vards ersion Four ns – s. inkin | $\frac{4 h}{peo}$ n act $\frac{5 h}{diffe}$ Emp $6 h$ Rule ng Ha $\frac{4 h}{s of g}$ | our ole ivity our erer ath our s fc ats our goo |
| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn - Body Storming – Module:3 De Define the proble perspectives on Pe mapping – Point o Module:4 Ide What is ideation – brainstorming – N Doodling – Use of Module:5 Pro- Prototyping – Typ stories – Reachin | el – Applications of design thinking in various domains. mpathize Phase hize with the users - Steps in empathize phase – Developing em- ter's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per- rsonas – Steps to creating personas – Problem statement – Affin f View – "How might we" questions – Why-how laddering – C eate Need for ideation – Uses of ideation – Ideation Methods – Br find maps – Guidelines to create mind maps – Ideation game f doodling in expressing creative ideas – Case studies. | pathy ps in sonas ity di ase st ainste s - Si | y tow immo s – F agrar agrar ormir x Th | vards ersion Four ns – s. inkin | $\frac{4 h}{peo}$ n act $\frac{5 h}{diffe}$ Emp $6 h$ Rule ng Ha $\frac{4 h}{s of g}$ | oun ole ivit: oun erer oun s fc ats oun goo |
| the five-stage mode Module:2 En Empathy – Empath Assuming a beginn - Body Storming – Module:3 De Define the proble perspectives on Pe mapping – Point o Module:4 Ide What is ideation – brainstorming – N Doodling – Use of Module:5 Pro- Prototyping – Typ stories – Reachin | el – Applications of design thinking in various domains. apathize Phase hize with the users - Steps in empathize phase – Developing en- ter's mindset – Ask What? And Why? – Immersion Activity – Ste Case studies. fine Phase em and interpret the result – Analysis and synthesis – Per- rsonas – Steps to creating personas – Problem statement – Affin f View – "How might we" questions – Why-how laddering – C eate Need for ideation – Uses of ideation – Ideation Methods – Br find maps – Guidelines to create mind maps – Ideation game f doodling in expressing creative ideas – Case studies. ototype bes of prototyping – Guidelines for prototyping – Story telling – ig users through stories – Importance of prototyping in de | pathy ps in sonas ity di ase st ainste s - Si | y tow immo s – F agrar agrar ormir x Th | vards ersion Four ns – s. inkin | $\frac{4 h}{peo}$ n act $\frac{5 h}{diffe}$ Emp $6 h$ Rule ng Ha $\frac{4 h}{s of g}$ | oun ole ivit: oun erer oun s fc ats oun goo |





| Need to test -User feedback - Conduct | ting a user test | - Guidelines f | for planning a test - | - How to test - |
|---|------------------|-----------------|-----------------------|-----------------------------|
| Desirable, feasible and viable solutions - | Iterate phase. | | | |
| Module:7 Role of Design Thinkin | ıg | | | 3 hours |
| Software and good design - Design think | ting and coding | g-Agile Metho | dology – Difference | es between agile |
| and design thinking - Complementing agi | le with design | thinking | | |
| | | | | |
| Module:8 Contemporary Issues | | | | 1 hour |
| Guest lecture by Industry Experts or R& | D organization | | | |
| | | Total L | ecture hours: | 30 hours |
| Text Book(s) | | | | |
| 1. Tim Brown, Change by Design: H | Iow Design Th | inking Transfor | ms Organizations an | d Inspires, 1 st |
| Edition, HarperCollins, 2009. | | | | |
| 2. Eli Woolery, Design Thinking Ha | ndbook, Invisio | on, 2019. | | |
| Reference Books | | | | |
| 1. Nir Eyal , Hooked: How to build | U, | | | |
| 2. Rod Judkins, The Art of Creative | 0, 1 | | | |
| Mode of Evaluation: CAT / Assignm | nent / Quiz / H | TAT / Project / | / Seminar | |
| | | | | |
| List of Challenging Experiments (Ind | licative) | | | |
| 1 Immersion Activity | | | | |
| 2 Problem Definition | | | | |
| 3 Different Points of View | | | | |
| 4 Brainstorming session | | | | |
| 5 Drawing Mind Maps | | | | |
| 6 Ideation Games | | | | |
| 7 Creating Prototype | | | | |
| 8 Planning and working on video st | • | | | |
| 9 Completing the prototype as per s | schedule | | | |
| 10 Testing the prototype | | | · • | 201 |
| Mode of Aggeggments Assessment (1) | | | atory Hours: | 30 hours |
| Mode of Assessment: Assessments/ | 29-01-2021 | v | | |
| Recommended by Board of Studies Approved by Academic Council | No. 61 | Date | 18-02-2021 | |
| Approved by Academic Coulicit | 110.01 | Date | 10-02-2021 | |





| Course code | Course Title L | Т | Р | J | С |
|---|---|-------------------------------|---|---|---|
| CBS3001 | Computer Networks 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | Syl | | s versio | n |
| | | | v. 1. | 0 | |
| Course Objectives: | | | | | |
| | anding of the fundamental concepts of computer networking | g, pro | otocol | s, | |
| architectures, and | | | | | |
| | design, implement and analyze performance perspective of ISC |)- OS | I layei | red | |
| Architecture | | | | | |
| 3. Deal with the maj | or issues of the layers of the model. | | | | |
| Expected Course Ou | itcome: | | | | |
| - | rent building blocks of Communication network and its archite | ecture | 2. | | |
| - | types of switching networks and analyse the performance of n | | | | |
| | us error detection and correction mechanisms, flow control | | | sms ar | ıd |
| various routing p | | | | | |
| 4. Design subletting | and analyse the performance of network layer, Construct and | ł exa | mine | various | |
| routing protocols | | | | | |
| | nctionality of various layer and its associated protocols | | | | |
| 5. Understand the fu | | | | | |
| | | | | | |
| Module:1IIntroduction:ComPreliminaries of layer | Introduction to Computer Networks apputer networks and distributed systems, Classifications of ered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Tran | Repre | esenta | netwo | |
| Module:1IIntroduction: ComPreliminaries of layeand its flow, Various | puter networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Tran | Repre | esenta | netwo tion of IediA | orks, data |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2N | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Tran Network Topology and Bandwidth | Repro | esenta sion N | r netwo tion of AediA 3 h | orks data |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2NLAN:Wired LAN, | Apputer networks and distributed systems, Classifications of ered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Tran Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utili | Repression Ansmis Zatio | esenta sion N | r netwo tion of AediA 3 h | orks, data |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2NLAN:Wired LAN, | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Tran Network Topology and Bandwidth | Repression Ansmis Zatio | esenta sion N | r netwo tion of AediA 3 h | orks, data |
| Module:1IIntroduction: ComPreliminaries of layeand its flow, VariousModule:2NLAN: Wired LAN, WFrequency division, T | Apputer networks and distributed systems, Classifications of ered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Tran Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utili | Repression Ansmis Zatio | esenta sion N | r netwo tion of AediA 3 h Itiplex | orks, data |
| Module:1IIntroduction:ComPreliminaries of layerand its flow,VariousModule:2NLAN:Wired LAN,Frequencydivision,Module:3I | apputer networks and distributed systems, Classifications of ered network structures. Data communication Components: 1 connection topology, Protocols and Standards, OSI model, Transverse Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum | Repro | esenta sion N n: Mu | netwo tion of AediA 3 h Iltiplex 5 h | orks, data ours ing - ours |
| Module:1IIntroduction:ComPreliminaries of layerand its flow,VariousModule:2MLAN:Wired LAN,Frequency division,TModule:3IFundamentals of Err | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Transverse Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer | Repronsmis | n: Mu | r netwo tion of AediA 3 h Itiplex 5 h | orks data ours ing - ours Flow |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2NLAN:Wired LAN,Frequency division,TModule:3IFundamentals of ErrControl and Error com | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Transverse Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Time division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming | Repronsmis | n: Mu | netwo tion of AediA 3 h Iltiplex 5 h CRC; H | ours ours ing - ours flow ding |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2NLAN:Wired LAN,Frequency division,TModule:3IFundamentals of ErrControl and Error com | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: 1 connection topology, Protocols and Standards, OSI model, Transition Compology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Time division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming ontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOF | Repronsmis | n: Mu | netwo tion of AediA 3 h Iltiplex 5 h CRC; H | ours ours ing - ours flow ding |
| Module:1IIntroduction:ComPreliminaries of layeand its flow,VariousModule:2MLAN:Wired LAN,Frequency division,TModule:3IFundamentals of ErrorControl and ErrorWindow,Piggyback | aputer networks and distributed systems, Classifications of ered network structures. Data communication Components: 1 connection topology, Protocols and Standards, OSI model, Transition Compology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Time division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming ontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOF | Repronsmis | n: Mu | netwo tion of AediA 3 h Iltiplex 5 h CRC; H | ours ours ing - ours flow |
| Module:1 I Introduction: Com Preliminaries of layer and its flow, Various and its flow, Various Module:2 N Module:2 N N Frequency division, T T Module:3 I Fundamentals of Error com Control and Error com Window, Piggyback CSMA/CD, CDMA Module:4 N | puter networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Transet Network Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOF /CA | Repronsmis | n: Mu | r netwo tion of AediA 3 h Itiplex 5 h CRC; I RQ, Sli 1 ALO | ours ours ing - flow ding HA, |
| Module:1 I Introduction: Com Preliminaries of layer and its flow, Various and its flow, Various Various Module:2 N LAN: Wired LAN, W Frequency division, T T Module:3 I Fundamentals of Error co Window, Piggyback CSMA/CD, CDMA Module:4 Module:4 N | puter networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Transet Network Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Time division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOI /CA Network Layer addressing – IPV4, IPV6; Address mapping – ARP, | Repronsmis | n: Mu | r netwo tion of AediA 3 h Itiplex 5 h CRC; I RQ, Sli 1 ALO | ours ours ing - flow ding HA, |
| Module:1 I Introduction: Com Preliminaries of layer and its flow, Various and its flow, Various Various Module:2 N LAN: Wired LAN, W Frequency division, T T Module:3 I Fundamentals of Error co Window, Piggyback CSMA/CD, CDMA Module:4 Module:4 N | puter networks and distributed systems, Classifications of ered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Transet Network Topology and Bandwidth Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOF /CA | Repronsmis | n: Mu | r netwo tion of AediA 3 h Itiplex 5 h CRC; I RQ, Sli 1 ALO | ours ours ing - flow ding HA, |
| Module:1 I Introduction: Com Preliminaries of laye and its flow, Various Module:2 N LAN: Wired LAN, W Frequency division, T T Module:3 I Fundamentals of Err Control and Error com Window, Piggyback CSMA/CD, CDMA Module:4 N Switching, Logical DHCP–Delivery, Fom | puter networks and distributed systems, Classifications of pered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Trans Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOI /CA Network Layer addressing – IPV4, IPV6; Address mapping – ARP, rwarding and Unicast Routing protocols. | Repronsmis | n: Mu | r netwo tion of AediA 3 h iltiplex 5 h CRC; H RQ, Sli d ALO 5 h OOTP | ours ours ing - flow ding HA, |
| Module:1 I Introduction: Com Preliminaries of layer and its flow, Various and its flow, Various Module:2 Module:2 M LAN: Wired LAN, W Frequency division, T Module:3 I Fundamentals of Error C Window, Piggyback CSMA/CD, CDMA Module:4 M Switching, Logical DHCP–Delivery, Fo Module:5 T | puter networks and distributed systems, Classifications of pered network structures. Data communication Components: I connection topology, Protocols and Standards, OSI model, Trans Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective ring, Random Access, Multiple access protocols - Pure ALOI /CA Network Layer addressing – IPV4, IPV6; Address mapping – ARP, rwarding and Unicast Routing protocols. | Repronsmis | n: Mu nce, (at AF Slotted P, B | r netwo tion of AediA 3 h iltiplex 5 h CRC; I RQ, Sli 1 ALO 5 h OOTP 6 h | ours ours ing - ours flow ding HA, and ours |
| Module:1 I Introduction: Com Preliminaries of laye and its flow, Various Module:2 N LAN: Wired LAN, W Frequency division, T T Module:3 I Fundamentals of Err Control and Error com Window, Piggyback CSMA/CD, CDMA Module:4 N Switching, Logical DHCP–Delivery, Fo Module:5 T Process to Process of T | puter networks and distributed systems, Classifications of pered network structures. Data communication Components: connection topology, Protocols and Standards, OSI model, Trans Network Topology and Bandwidth Wireless LAN, Virtual LAN. Techniques for Bandwidth utiliz Fime division and Wave division, Concepts on spread spectrum Data Link Layer and Medium Access SubLayer ror Detection and Error Correction, Block coding, Hamming pontrol protocols - Stop and Wait, Go-back–N ARQ, Selective cing, Random Access, Multiple access protocols - Pure ALOI /CA Network Layer addressing – IPV4, IPV6; Address mapping – ARP, rwarding and Unicast Routing protocols. | Repronsmis | n: Mu n: Mu nce, (cat AF Slotted P, B | r netwo tion of AediA 3 h iltiplex 5 h CRC; H Q, Sli d ALO 5 h OOTP 6 h | ours ing - ours flow ding HA, and ours and |



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CURRICULUM (2022 - 2023)

| Mo | dule:6 | Application Layer | | | | | 3 hours |
|------|------------------|-----------------------------|--------------------|------------------|---------------------|---------|----------|
| DN | S, DDNS, TE | LNET, EMAIL, FTP, W | WW, HTTP, SNN | /IP, Blueto | oth, Firewalls. | | |
| | | | | | | | |
| | dule:7 | Network Security | | | | | 2 hours |
| Elec | etronic mail, c | lirectory services and netw | vork management, | Basic con | cepts of Cryptogra | iphy. | |
| | | | | | | | |
| | dule:8 | Contemporary issues | | | | | 2 hours |
| Gue | est lecture by l | ndustry Experts or R&D | organization | | | | |
| | | | | Total Leo | cture hours: | | 30 hours |
| Text | Book(s) | | | | | | |
| 1. | | , Computer Networks, Pe | | | | | |
| 2. | | llings. Data and compute | r communications | . Pearson E | Education India, 20 | 013. | |
| Refe | rence Book(s | | | | | | |
| 1. | | , Kaufman, C., and Spec | | Network s | ecurity: private co | ommun | ication |
| | - | world. Pearson Education | | | | | |
| 2. | | . R., Fenner, B., and Rudo | off, A. M. (2018). | UNIX Net | work Programmin | ıg Volu | me |
| | 1. SMIT-SN | 1U. | | | | | |
| Mod | e of Evaluat | ion: CAT / Assignmen | t / Quiz / FAT / | Project / S | Seminar | | |
| | | | | | | | |
| | | ng Experiments (Indica | | | | | |
| 1. | | on of all networking hardw | | | | | |
| 2. | Network Sy | stem Administration: Un | derstanding switcl | hes and rou | ters | | |
| 3. | Network co | nfiguration commands us | ing Linux | | | | |
| 4. | Error detect | tion and correction mecha | anisms | | | | |
| 5. | Flow contro | ol mechanisms | | | | | |
| 6. | Simulation | of unicast routing protoco | ols | | | | |
| 7. | Observing I | Packets across the networ | k and Performanc | e Analysis | of Routing protoc | cols | |
| 8. | Socket prog | ramming (TCP and UDP) | – Multi client ch | atting | | | |
| 9. | Develop a I | ONS client server to resol | ve the given host | name or IP | address | | |
| 10. | Implementa | tion of Layers for securit | y protocols - SSL | /TLS | | | |
| | | | | To | otal Laboratory H | Iours | 30 hours |
| Mod | e of Assessm | ent: Assessments/ Mid | Term Lab/ FAT | / Project | | | |
| | | | | | | | |
| | mmended by | y Board of Studies | 16-09-2020 | | | | |



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CURRICULUM (2022 - 2023)

| Course code | Course Title | L | Т | Р | J | C |
|------------------------|---|---------|------------|----------|---------|-----|
| CBS3002 | Information Security | 2 | 0 | 2 | 0 | 3 |
| Pre- requisite | NIL | Syll | labu | sversi | | |
| | | | | v. 1.0 | | |
| Course Objectives: | | | | | | |
| • • | actice fundamental techniques in developing secure application | | | | | |
| 2. To understand t | he policy, procedures and guidelines to protect the computing | ng res | sourc | es | | |
| Expected Course Ou | itcome: | | | | | |
| - | ecurity parameters and access control methods. | | | | | |
| | he fundamental policies and design principle of computing r | esoui | rces | | | |
| | stem design, logic based system | | | | | |
| | curity architecture of database, operating system and associate | ed vul | nera | bilities | 5 | |
| | | | | | | |
| Module:1 | | 4 | 4 hou | urs | | |
| Overview of Securi | ty Parameters: Confidentiality, integrity and availability; S | ecuri | ty vi | olatio | n and | |
| threats; Security pol | icy and procedure; Assumptions and Trust; Security Assurar | nce, I | mple | ement | ation | and |
| Operational Issues; S | ecurity Life Cycle. | | | | | |
| | | | | | | |
| Module:2 | | | 3 hou | urs | | |
| Access Control Mod | lels: Discretionary, mandatory, role-based and task-based m | odels | s, un | ified r | nodels | 3, |
| access control algebra | ra, temporal and spatio-temporal models. | | | | | |
| | | | | | | |
| Module:3 | | | 5 hou | | | |
| | onfidentiality policies, integrity policies, hybrid policies, non | i-inter | rfere | nceand | l polic | су |
| composition, internat | tional standards. | | | | | |
| | 1 | 1 | | | | |
| Module:4 | | | 5 hou | | | |
| | Design principles, representing identity, control of acces | | | | | |
| confinement problem | h. Assurance: Building systems with assurance, formal method | ods, e | valua | ating s | ystem | IS. |
| | Ι | 1 | _ . | | | |
| Module:5 | | | 6 hou | | | |
| | : Malicious logic, vulnerability analysis, auditing, intrusion | | | | | |
| | k security, operating system security, user security, program s | securi | ty.Sp | pecial | Topic | s: |
| Data privacy, introdu | action to digital forensics, enterprise security specification. | | | | | |
| Module:6 | | | 3 hou | urc | | |
| | ecurity: Security Architecture, Analysis of Security in Linux/ | | | | | |
| operating systems s | centry. Security Architecture, Analysis of Security III Elliux/ | vv 1110 | 10 W 5 | • | | |
| Module:7 | | | 2 hou | urs | | |
| | ecurity Architecture, Enterprise security, Database auditing. | - | | 413 | | |
| Database Security. S | county memoriale, interprise security, Database auditing. | | | | | |





| M | odule:8 | Contemporary issues | | | 2 hours |
|-----|------------------|--------------------------------------|-----------------|--------------|--------------------------|
| | | stry Experts or R&D organization | 1 | | |
| Gue | | Stry Experts of ReeD organization | | ecture hour | s: 30 hours |
| Те | ext Book(s) | | 1000111 | | |
| 1. | | ecurity engineering. John Wiley & | Sons. 2008. | | |
| 2. | | nputer Security: Art and Science. | | ation. Bosto | n. US. 2003. |
| 3. | T : | rmation security: principles and pr | | | |
| Re | eference Book(s) | | | | , |
| 1. | () | Pfleeger, S. L., and Margulies, J. | Security in Co | omputing,Pro | oQuest Safari Tech Books |
| | Online, 2017. | | - | | |
| 2. | Wheeler, D. A. | Secure programming HOWTO, 2 | 017. | | |
| 3. | Zalewski, M. G | oogle browser security handbook, | 2009. | | |
| 4. | Gertz, M., & Ja | jodia, S. (Eds.). Handbook of data | abase security: | applications | s andtrends. Springer |
| | Science & Busir | ness Media, 2007. | | | |
| M | ode of Evaluati | on: CAT / Assignment / Quiz / | / FAT / Proj | ect / Semin | ar |
| | | | | | |
| Li | | g Experiments (Indicative) | | | |
| 1. | - | curity in Unix/Linux. | | | |
| 2. | | n of users, password policies, privi | | | |
| 3. | Security assess | sment of information security syste | ems using auto | mated tools | |
| 4. | • | dentification and Prioritization | | | |
| 5. | Web Applicati | on Security Configuration | | | |
| | | | Total Labor | | s 30 hours |
| Μ | ode of Assessme | ent: Assessments / Mid Term I | Lab / FAT / P | Project | |
| Re | commended by | Board of Studies | 09-09-2020 | | |
| Ap | oproved by Acad | lemicCouncil | No.59 | Date | 24-09-2020 |





| Course Code | Course Title | L | Т | P | J | C |
|---|---|--|--|---|--|--|
| CBS3003 | Design and Analysis of Algorithms | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | | Sylla | | vers | sior |
| | | | V | . 1.0 | | |
| Course Objective | | | | | | |
| • | asymptotic performance of algorithms. | | | | | |
| | tant algorithmic design paradigms and methods of analysis. | | | | | |
| 3. Synthesize e | fficient algorithms in common engineering design situations. | | | | | |
| Expected Course | Outcome: | | | | | |
| | | | | | | |
| • | | | | | | |
| - | | | | | | |
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| | | | | | | |
| Module:1 Int | roduction to algorithmic analysis | | | | 8 ha | our |
| Average and Wors Analysis of Recur | t-Case behavior; Performance Measurements of Algorithm, Tims sive Algorithms through Recurrence Relations: Substitution M | e and | Space | e Tra | de-C | Offs |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu | t-Case behavior; Performance Measurements of Algorithm, Timesive Algorithms through Recurrence Relations: Substitution Measurements of Algorithmic Strategies | e and Ietho | Space d, Re | e Tra cursi | de-(on 7 7 ho | Dffs Free |
| Average and Wors Analysis of Recur Method and Master Module:2 Fur Brute-Force, Heu | t-Case behavior; Performance Measurements of Algorithm, Timesive Algorithms through Recurrence Relations: Substitution Ners' Theorem. | e and Ietho ; Illu | Space d, Re | e Tra cursi | de-(on 7 7 ho | Dffs Free |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. ndamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl | e and Ietho ; Illu | Space d, Re | e Tra cursi ons c | de-(on 7 7 ho | Dffs Tree Dur nes |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob Module:3 Gr | ics of Algorithm. Analysis of Algorithm: Asymptotic analysis of Complexity Bounds I Worst-Case behavior; Performance Measurements of Algorithm, Time and Space Trace Recursive Algorithms through Recurrence Relations: Substitution Method, Recursion Masters' Theorem. Fundamental Algorithmic Strategies e, Heuristics, Branch and Bound and Backtracking methodologies; Illustrations of or Problem-Solving, Bin Packing, Knapsack, Travelling Salesman Problem. | de-(on 7 7 hc of th 8 hc | Offs Free Dur ness | | | |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob Module:3 Gr Dynamic Program | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. ndamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl | e and Ietho ; Illu em. | Space d, Red stratio | e Tra cursi ons o | de-Con T 7 hc of th 8 hc Long | Dffs Free Dur nese Dur ges |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prot Module:3 Gr Dynamic Program Common Subsequ | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Problection Reedy and Dynamic Programming ningElements of Dy Programming, Rod Cutting, Matrix chain | e and Ietho ; Illu em. | Space d, Red stratio | e Tra cursi ons o | de-Con T 7 hc of th 8 hc Long | Dffs Free Dur nese |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob Module:3 Gr Dynamic Program Common Subsequ Knapsack proble, H | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl eedy and Dynamic Programming ningElements of Dy Programming, Rod Cutting, Matrix chain lence; Greedy Algorithms- Activity Selection Problem, Eleme Huffman Coding; Fibonacci Heaps | e and Ietho ; Illu em. | Space d, Red stratio | e Tra cursi ons o ion, edy s | de-C on 7 7 hc of th 8 hc Lon | Dffs Free Dur ness Dur ges egy |
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| Average and WorsAnalysis of RecurMethod and MasteModule:2FuBrute-Force, Heutechniques for ProbModule:3GrDynamic ProgramsCommon SubsequKnapsack proble, HModule:4Gr | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl eedy and Dynamic Programming ningElements of Dy Programming, Rod Cutting, Matrix chain tence; Greedy Algorithms- Activity Selection Problem, Eleme Huffman Coding; Fibonacci Heaps | e and Aetho ; Illu em. mult ents o | Space d, Red stration iplicat of gree | e Tra cursi ons o ion, edy s | de-C on 7 7 hc of th 8 hc Lon ₃ trate | Dffs Tree Dur ness Dur ges egy |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob Module:3 Gr Dynamic Program Common Subsequ Knapsack proble, H Module:4 Gr Traversal algorithr Transitive closure, | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Problem eedy and Dynamic Programming ningElements of Dy Programming, Rod Cutting, Matrix chain nence; Greedy Algorithms- Activity Selection Problem, Eleme Huffman Coding; Fibonacci Heaps aph and Tree Algorithms ns: Depth First Search (DFS) and Breadth First Search (BFS); S | e and Aetho ; Illu em. mult ents o | Space d, Red stration iplicat of gree | e Tra cursi ons o ion, edy s | de-C on 7 7 hc of th 8 hc Lon ₃ trate | Diffs Free Dur nese ges egy |
| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu techniques for Prob Module:3 Gr Dynamic Program Common Subsequ Knapsack proble, I Module:4 Gr Traversal algorithm Transitive closure, Module:5 Traversal | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution M rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl eedy and Dynamic Programming ningElements of Dy Programming, Rod Cutting, Matrix chain lence; Greedy Algorithms- Activity Selection Problem, Eleme Huffman Coding; Fibonacci Heaps aph and Tree Algorithms ns: Depth First Search (DFS) and Breadth First Search (BFS); S Minimum Spanning Tree, Topological sorting, Network Flow Algorithms Algorithm and Search (BFS); S | e and Aetho ; Illu em. mult ents c horte | Space d, Red stration iplicat of gree st path im. | e Tra cursi ons o ion, edy s | de-C on 7 7 hc of th 8 hc Long trate 5 hc orith | Diffs Free Dur ness ges egy Dur nms |
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| Average and Wors Analysis of Recur Method and Maste Module:2 Fu Brute-Force, Heu: techniques for Prob Module:3 Gr Dynamic Programi Common Subsequ Knapsack proble, H Module:4 Gr Traversal algorithm Transitive closure, Module:5 Tra Computability of A Standard NP-comp Module:6 Ap | t-Case behavior; Performance Measurements of Algorithm, Tim sive Algorithms through Recurrence Relations: Substitution N rs' Theorem. Indamental Algorithmic Strategies ristics, Branch and Bound and Backtracking methodologies blem-Solving, Bin Packing, Knapsack, Travelling Salesman Probl eedy and Dynamic Programming mingElements of Dy Programming, Rod Cutting, Matrix chain bence; Greedy Algorithms- Activity Selection Problem, Elemed Huffman Coding; Fibonacci Heaps aph and Tree Algorithms ns: Depth First Search (DFS) and Breadth First Search (BFS); S Minimum Spanning Tree, Topological sorting, Network Flow Al actable and Intractable Problems Mgorithms, Computability classes – P, NP, NP-complete and NE | e and Aetho ; Illu em. mult ents o horte gorith | Space d, Red stration iplicat of gree st path m. 1. Coc | e Tra cursi ons o ion, edy s n algo k's t | $\frac{de-C}{on 7}$ $7 hc$ $\overline{7 hc}$ $\overline{7 hc}$ $\overline{7 hc}$ $\overline{7 hc}$ $\overline{5 hc}$ $\overline{5 hc}$ $\overline{5 hc}$ $\overline{5 hc}$ | Diffs Free Dur ness Dur ges egy Dur ms Dur rem |





| Module:7 | Quantum Algorithms | 2 hours |
|---------------|--|------------------|
| Introduction | to Quantum Algorithms | |
| | | |
| Module:8 | Contemporary issues | 2 hours |
| Guest lecture | e by Industry Experts or R&D organization | |
| | Total Lecture hours: | 45 hours |
| Text Book(| | |
| 1. Horo | witz, E., Sahni, S., & Rajasekaran, S. Fundamental of computer algorit | hms, Hyderabad, |
| Univ | ersities Press; Second edition, 2008. | |
| 2. Kleir | berg J, Tardos E. Algorithm design. Pearson Education India; 2006 | |
| Reference H | Sooks | |
| | h Donald E, "Art of Computer Programming: Fundamental Algorithm | ms Volume 1 - |
| | amental Algorithms", Third Edition, Pearson Publishers, 2011. | |
| | Arin, "Open Data Structures: An Introduction (Open Paths to Enriched Lea | rning)" 31st ed |
| | on, UBC Press, 2013.1974. | ining), 51st cd. |
| | valuation: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| Mode of Ev | auation: CA1/Assignment/Quiz/FA1/Project/Semmar | |
| List of Cha | lenging Experiments (Indicative) | |
| | ementation of various data structures (recap) | |
| 1 | puting the time complexity of the given algorithms | |
| | e force strategy | |
| | dy strategy -Activity selection, knapscak | |
| | mic programming- MCM, LCS and 0/1 knapsack | |
| 6 Bran | ch and Bound strategy | |
| | tracking -8 Queens problem | |
| | h search algorithms | |
| | mum Spanning Tree | |
| | test path algorithm | |
| | vork flow – Min cut | |
| 12 Appr | oximation algorithms- TSP and vertex cover | 201 |
| | Total Laboratory Hours: | 30 hours |
| | sessment: Assessments/ Mid Term Lab/ FAT / Project | |
| | ded by Board of Studies29-01-2021v Academic CouncilNo. 61Data18.02.2021 | |
| Approved b | y Academic Council No. 61 Date 18-02-2021 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | Course Title | L | T | P | J | C |
|---|--|--|---|--|--|---|
| CBS3004 | Artificial Intelligence | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | | | labus | | ion |
| Course Objectiv | | | | v. 1.0 |) | |
| Course Objectiv | ificial intelligence principles, techniques and its history. | | | | | |
| - | | | | | la 1 a ma | |
| | applicability, strengths, and weaknesses of the basic knowledge replearning methods in solving engineering problems. | fese | itatioi | i, pro | biem | |
| | | 1 | 1.1 | | | |
| 5. To develop 1 | ntelligent systems by assembling solutions to concrete computationa | u pro | oblems | \$ | | |
| Expected Cour | se Autcome: | | | | | |
| <u> </u> | ficial Intelligence (AI) methods and describe their foundations. | | | | | |
| | principles of AI in solutions that require problem solving, inference, p | oerce | ntion | know | ledge | |
| representation | | 50100 | puon, | KIIO W | louge | |
| 1 | knowledge of reasoning and knowledge representation for solving | real | world | Inrohl | ems | |
| | illustrate how search algorithms and planning play vital role in probl | | | - | • | |
| = | ent scope and limitations of AI and societal implications. | | 011112 | . | | |
| | implement the construction of basic AI models and expert systems | | | | | |
| 0. Indstrate and | implement the construction of basic 74 models and expert systems | • | | | | |
| Module:1 | Introduction, Overview of Artificial intelligence | | | | 4 H | ักไ |
| | I, AI technique, Tic - Tac - Toe problem. Intelligent Agents, Agents | & e | nviror | ment | | |
| | , in teeningue, ine interite problem, interingent rigents, rigents | | | | | |
| | | | | ment | , | 11 0 |
| | , structure of agents, goal-based agents, utility-based agents, learning | | | | , | *1 \ |
| | , structure of agents, goal-based agents, utility-based agents, learning | | | | | |
| of environment Module:2 | , structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search | g age | ents. | | 3 H | 01 |
| of environment Module:2 | structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characteristic | g age | ents. | | 3 H | [01 |
| of environment Module:2 Defining the pr of search progr | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris rams. | g age | ents. | | 3 H le des | lou |
| of environment Module:2 Defining the pr of search progr Module:3 | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris rams. Search techniques | g age | issues | s in th | 3 H le dea 5 H | loi sig |
| of environment Module:2 Defining the program of search program Module:3 Problem solvin | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris roms. Search techniques ng agents, searching for solutions; uniform search strategies: breactering | g age stics, | issues | in th | 3 H le des 5 H depth | lon Sig |
| of environment Module:2 Defining the program of search program Module:3 Problem solvin search, depth | A, structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris roms. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies: | g age stics, lth fir | nts. issues rst sea ies. H | s in th arch, o leuris | 3 H le des 5 H depth tic so | |
| of environment Module:2 Defining the program of search program Module:3 Problem solving search, depth backson and a strategies Greeners Strategies Greeners | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris roblem as state space search, production system, problem characteris rams. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies and best-first search, A* search, AO* search, memory bounded heuroper search search and best-first search, A* search, AO* search, memory bounded heuroper search search and best-first search, A* search, AO* search, memory bounded heuroper search search and best-first search, A* search, AO* search, memory bounded heuroper search search search and search and search search and search search and | g age stics, lth fi rateg | nts. issues rst sea ies. H | in the state of th | 3 H le des 5 H depth tic so cal so | |
| of environment Module:2 Defining the program of search program Module:3 Problem solvin search, depth b strategies Gree | A, structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characteris roms. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies: | g age stics, lth fi rateg | nts. issues rst sea ies. H | in the state of th | 3 H le des 5 H depth tic so cal so | |
| of environment Module:2 Defining the proof of search proof Module:3 Problem solvin search, depth b strategies Gree algorithms & o | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characteris orange Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies; breacting the search, A [*] search, AO [*] search, memory bounded heuptimization problems: Hill climbing search, simulated annealing search | g age stics, lth fi rateg | nts. issues rst sea ies. H | in the state of th | 3 H ie des 5 H depth tic so cal so searc | lou sig |
| of environment Module:2 Defining the pro- of search program Module:3 Problem solving search, depth backstrategies Greeners algorithms & o Module:4 | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characteris rams. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strated best-first search, A* search, AO* search, memory bounded heuptimization problems: Hill climbing search, simulated annealing search Constraint satisfaction problems | g age stics, lth fi rateg ristic rch, l | nts. issues rst sea ies. H e searc ocal b | s in the arch, of leuris ch: loo eam s | 3 H ae des 5 H depth tic se cal se searc 4 H | ion sig |
| of environment Module:2 Defining the program of search program Module:3 Problem solving search, depth by strategies Greener algorithms & our Module:4 Local search for | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characterise rams. Search techniques ng agents, searching for solutions; uniform search strategies: breact imited search, bidirectional search, comparing uniform search strategies: breact dy best-first search, A* search, AO* search, memory bounded heu ptimization problems: Hill climbing search, simulated annealing search or constraint satisfaction problems. Adversarial search, Games, optime | g age stics, lth fi rateg ristic rch, l | issues rst sea ies. H c searc ocal b ecisior | s in the arch, of leuris ch: loo eam s | 3 H ie des 5 H depth tic se cal se searc 4 H strate | lou sig |
| of environment Module:2 Defining the program of search program Module:3 Problem solving search, depth by strategies Greener algorithms & our Module:4 Local search for | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characteris rams. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strated best-first search, A* search, AO* search, memory bounded heuptimization problems: Hill climbing search, simulated annealing search Constraint satisfaction problems | g age stics, lth fi rateg ristic rch, l | issues rst sea ies. H c searc ocal b ecisior | s in the arch, of leuris ch: loo eam s | 3 H ie des 5 H depth tic se cal se searc 4 H strate | lou sig |
| of environment Module:2 Defining the program of search program Module:3 Problem solvin search, depth lastrategies Greet algorithms & our Module:4 Local search for in games, the rest | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search roblem as state space search, production system, problem characterise rams. Search techniques ng agents, searching for solutions; uniform search strategies: breactimited search, bidirectional search, comparing uniform search strategies: breacting to solutions; uniform search, memory bounded heuptimization problems: Hill climbing search, simulated annealing search Constraint satisfaction problems r constraint satisfaction problems. Adversarial search, Games, optiminimax search procedure, alpha-beta pruning, additional refinement | g age stics, lth fi rateg ristic rch, l | issues rst sea ies. H c searc ocal b ecisior | s in the arch, of leuris ch: loo eam s | 3 H ie des 5 H depth tic se cal se searc searc 4 H strate ening | ion sig |
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| of environment Module:2 Defining the proof of search progra Module:3 Problem solvin search, depth l strategies Gree algorithms & o Module:4 Local search for in games, the r Module:5 Knowledge re | A structure of agents, goal-based agents, utility-based agents, learning Problem Solving, Problems, Problem Space & search oblem as state space search, production system, problem characteris rams. Search techniques ng agents, searching for solutions; uniform search strategies: breact imited search, bidirectional search, comparing uniform search strategies: breact dy best-first search, A* search, AO* search, memory bounded heu ptimization problems: Hill climbing search, simulated annealing search or constraint satisfaction problems or constraint satisfaction problems. Adversarial search, Games, optiminimax search procedure, alpha-beta pruning, additional refinement Knowledge & reasoning presentation issues, representation & mapping, approaches to kn | g age stics, lth fi rateg ristic rch, l nal de s, ite owle | rst sea issues rst sea ies. H ecision rative | s in the arch, o leuris ch: loo eam s deepo | 3 H le des 5 H depth tic se cal se searc 4 H strate ening 5 I entat | ion ig ig ion h. ion ion |
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VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Module:6 | Probabilistic Reasonin | g | | | 4 Hours |
|---------------------|--------------------------------|---------------------|-------------------|----------------------------|----------------|
| Representing | knowledge in an uncertain | domain, the | semantics of Bay | vesian networks, Dempste | er- Shafer |
| theory, Plann | ing Overview, components | of a planni | ng system, Goal | stack planning, Hierarch | nical planning |
| other plannin | | | | | 1 0 |
| 1 | | | | | |
| Module:7 | Expert Systems | | | | 3 Hour |
| | and using domain knowledg | e. expert sys | stem shells, and | knowledge acquisition. | 0 11041 |
| | | <u>, p </u> | | | |
| Module:8 | Contemporary issues | | | | 2 Hour |
| Guest lecture | by Industry Experts or R& | D organizat | ion | | |
| | | U | | tal Lecture Hours | 30 Hour |
| Fext Book(s) | | | | | |
| 1. Russell | , S. and Norvig, P. Artificial | Intelligence | - A Modern Ap | proach, 3rd edition, Prent | tice Hall., |
| 2015. | | | | | |
| 2. Poole, | D. and Mackworth, A. Artif | icial Intellige | ence: Foundatior | s of Computational Agen | nts, |
| | dge University Press, 2010 | | | | |
| Reference Bo | | | | | |
| | Knight, K and Shankar, B. | | - | | |
| | G.F Artificial Intelligence | -Structures a | nd Strategies for | Complex Problem Solvin | ng, 6th |
| | Pearson, 2008. | | | | |
| Mode of Eva | uation: CAT / Assignme | ent / Quiz / | FAT / Project | / Seminar | |
| | | | | | |
| Lab Experime | | | | | |
| | Missionaries and cannibals | problems | | | |
| | ug Problem ns Problem | | | | |
| | ing Salesman Problem | | | | |
| | Wampus Problem using Lo | aia | | | |
| ر د | ys and Bananas Problem usi | | | | |
| | in Classification Problem | ing Logic | | | |
| | on Tree Problem | | | | |
| | ping a sentiment analysis sy | stems | | | |
| | pment of Medical Expert sy | | ecommendation | system | |
| | phient of theorem Expert sy | | | Laboratory Hours: | 30 Hour |
| Mode of Acc | essment: Assessments/] | Mid Torm I | | v | |
| | led by Board of Studies | 29-01-202 | | ycu | |
| | y Academic Council | 29-01-202 No. 61 | Date | 18-02-2021 | |
| Approved D | | 110.01 | Date | 10-02-2021 | |





B. Tech Computer Science and Engineering and Business Systems

| Course Code | Course Title | L | Τ | Р | J | С |
|---|--|-------|--------|----------|-------------|---------------------|
| CBS3011 | Usability Design of Software Applications | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | | Sylla | bus | vers | ion |
| | | | | v.1. | 0 | |
| Course Objective | s: | | | | | |
| | rning system through which management students can enhance | e th | eir ii | nnov | atio | n an |
| creative thinking | skills | | | | | |
| - | nselves with the special challenges of starting new ventures | | | | | |
| 3. To use IPR as a | n effective tool to protect their innovations and intangible assets fi | rom | expl | oitati | on | |
| | | | | | | |
| Expected Course | | | | <u> </u> | | |
| | e students to the fundamentals of User Centred Design and | Use | r Exj | perie | ence | thei |
| | tribution to businesses | | | | | |
| | m to the facets of User Experience (UX) Design, particularly as | s ap | plied | l to t | he d | igita |
| artefacts | | | | - | | |
| | Fuser research, solution conceptualization and validation as inter | wov | ven a | ctivi | ties i | in th |
| design and develo | ± • | | | | | |
| | lity to constructively engage with the Design professionals they v | wou | ld wo | ork v | vith | in th |
| future | | | | | | |
| • | ntify the methods to offer a better UI experience for the applicatio | | | | | |
| 6. Gain expertise i | n redesigning an existing Application or website for better user exp | perie | ence | | | |
| | | | | | | |
| | ntroduction to User Centred Design | | | | 3 ł | 1001 |
| Basics of User Cer | itered Design | | | | | |
| | | | | | 41 | |
| | spects of User Centred Design | daai | ~ ~ ~ | | | 10UI |
| | tion Assignment – Evaluating the product from user centered of | Jesi | gn as | speci | s su | cn a |
| functionality, ease | of use, ergonomics, and aesthetics. | | | | | |
| Module:3 H | euristic Evaluation | | | | 61 | 1011 |
| | iples, Examples Heuristic Evaluation: Group Assignment initiati | ion | Weł | site | | |
| 10 Houristic I fille | ipies, Enumpies rieuristic Erutaution. Group rissignment initiat | ion, | | | unu | 1 191 |
| Evaluation for key | | nme | ndati | CHIN - | | |
| Evaluation for key | tasks of the app or website for heuristic principles, severity, recon | nme | ndati | ons. | | |
| - | tasks of the app or website for heuristic principles, severity, recon | nme | ndati | 0118. | 41 | 10111 |
| Module:4 P | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle | | | | | 1011 esig |
| Module:4 P Redesign project | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design | | | | | |
| Module:4 P Redesign project | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design | | | | | |
| Module:4 P Redesign project Prototype) - Usabi | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design | | | | t (D | esig |
| Module:4PRedesign projectPrototype) - UsabiModule:5 | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design lity Testing | - Iı | nple | men | t (D 5 ł | esig |
| Module:4PRedesign projectPrototype) - UsabiModule:5Understanding use | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design lity Testing X Research | - Iı | nple | men | t (D 5 ł | esig |
| Module:4PRedesign projectPrototype) - UsabiModule:5Understanding use | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design lity Testing X Research ers, their goals, context of use, and environment of use. Research | - Iı | nple | men | t (D 5 ł | esig |
| Module:4PRedesign projectPrototype) - UsabiModule:5UUnderstanding useEnquiry, User Inte | tasks of the app or website for heuristic principles, severity, recon roject design lifecycle through the design lifecycle – Discovery - Define – Design lity Testing X Research ers, their goals, context of use, and environment of use. Research | - Iı | nple | men | t (D 5 ł | esi 101 xtu |

Scenarios and Persona Technique –Overview of Design Thinking Technique - Discovery and brainstorming





| Mod | lule:7 | Development and Protot | yping | | | 3 hours |
|------|--------------|---|---------------------|----------------|---------------------|-----------------------------|
| Con | cept Deve | lopment - Task flow detailin | ng for the Project | - Prototypi | ngTechniques - Pap | ber, Electronic, |
| and | Prototypin | g Tools. | | | | |
| | | - | | | | |
| Mod | lule:8 | Contemporary issues | | | | 2 hours |
| Gues | st lecture b | y Industry Experts or R&D | organization | | I | |
| | | | | Total Le | ecture hours: | 30 hours |
| Text | t Book(s) | | | | | |
| 1. | | Preece, Helen Sharp, Yvo | | teraction D | esign: Beyond Hur | nan-Computer |
| | | on", 2015, 4 th Edition, Wiley | publications. | | | |
| | erence Bo | | | | | |
| 1. | | oper and Robert Riemann, | "About Face The | e Essentials | of Interaction Desi | ign", 2014, 4 th |
| | | Wiley Publications. | | | | |
| 2. | | h Goodman, Mike Kuniav | | | | |
| | | ner's Guide to User Research | | | | olications. |
| Moo | le of Eval | luation: CAT / Assignmen | nt / Quiz / FAT / | / Project / S | Seminar | |
| | | | | | | |
| List | of Challe | nging Experiments (Indica | ative) | | | |
| 1. | Identify a | a website or an App to redesi | gn, with justificat | ion | | |
| 2. | Analysis | of the mobile app or the web | site through the c | lesign life cy | ycle | |
| 3. | Identifyi | ng Personas and Scenarios fo | or the App or the | website | | |
| 4. | | development and task flow d | | | | |
| 5. | Prototype | e development with Iteration | s and justificatior | 1 | | |
| 6. | Usability | testing and demonstration | | | | |
| | | | | | al Laboratory Hou | rs: 30 hours |
| Mod | le of Asse | ssment: Assessments/Mid | term lab/Projec | t/FAT | | |
| Reco | ommende | d by Board of Studies | 22-05-2021 | | | |
| Арр | roved by | Academic Council | No. 62 | Date | 15-07-202 | 21 |
| | | | | | | |



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Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title L | | P | J | C |
|---|--|---------------|-----------------|---|-------------------------------------|
| CBS3012 | IT Project Management 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | Syl | labus | | ior |
| | | | v.1.0 |) | |
| Course Objectives: | | | | | |
| • 1 | , manage, execute, and control projects within the stipulated time | a | | | |
| | age cost targets with a focus on Information Technology and Servic | | ctor | | |
| 3. To understand vari | ous agile project management techniques such as Scrum and DevO | ps. | | | |
| | | | | | |
| Expected Course O | | | 4 -1-11 | | 1. |
| | | | | S W1 | n |
| | | - | | 1. | |
| - | ty network to use PERT and to manage project risks such as Resou | rce s | chedu | ling | anc |
| | | | | | |
| | | | | | |
| | | | | | |
| | | iven | meth | ods | ano |
| - | • | | | | |
| 6. To demonstrate th | e working of IT Project Management with various tools and techno | ologi | es. | | |
| cost control. To understand the concept of Agile Project Management and IT Service To understand the various terminologies and best practices followed in state of the concept of Devops and its Working, Automated testin continuous deployment. To demonstrate the working of IT Project Management with various too Module:1 Project Overview and Feasibility Studies roject Identification, Market and Demand Analysis, Project Cost Estimate, | | | | | |
| Module:1 Proj | iect Overview and Feasibility Studies | | | 3 ho | |
| | | | | 5 110 | ur |
| | | prais | al. | 5 110 | ur |
| Project Identification, | Market and Demand Analysis, Project Cost Estimate, Financial Ap | prais | al. | | |
| Project Identification, Module:2 Proj | Market and Demand Analysis, Project Cost Estimate, Financial Ap | - | | 5 ho | ur |
| Project Identification, Module:2 Proj Project Scheduling, I | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced | ence | Relat | 5 ho ionsl | ur nip |
| Project Identification, Module:2 Proj Project Scheduling, I Difference between I | Market and Demand Analysis, Project Cost Estimate, Financial Ap | ence | Relat | 5 ho ionsl | ur nip |
| Project Identification, Module:2 Proj Project Scheduling, I | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced | ence | Relat | 5 ho ionsl | ur nip |
| Project Identification, Module:2 Proj Project Scheduling, I Difference between I activity. | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct | ence | Relat | 5 ho ionsl shinį | ur nip g of |
| Project IdentificationModule:2ProjProject Scheduling, IDifference between Iactivity.Module:3Cos | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling | ence | Relat | 5 ho ionsl | ur nip g 0 |
| Project IdentificationModule:2ProjProject Scheduling, IDifference between Iactivity.Module:3Cos | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct | ence | Relat | 5 ho ionsl shinį | ur nip g o |
| Project IdentificationModule:2ProjectProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost Control | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling | ence | Relat | 5 ho ionsl shing 3 ho | ur nip g o ur |
| Project IdentificationModule:2ProjProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4Proj | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling ject Management Features | ence | Relat | 5 ho ionsl shinį | ur nip g or ur |
| Project IdentificationModule:2ProjProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4Proj | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling | ence | Relat | 5 ho ionsl shing 3 ho | ur nip g of ur |
| Project IdentificationModule:2ProjectProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjRisk Analysis, Project | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling ject Management Features t Control, Project Audit and Project Termination | ence | Relat | 5 ho ionsl shing 3 ho 3 ho | ur nip g or ur |
| Project Identification,Module:2ProjProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjRisk Analysis, ProjectModule:5Agil | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling ject Management Features t Control, Project Audit and Project Termination e Project Management | ence ion t | Relat by Cra | 5 ho ionsl shing 3 ho 3 ho | ur nip g or ur |
| Project IdentificationModule:2ProjectProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjRisk Analysis, ProjectModule:5AgilIntroduction, Agile P | Market and Demand Analysis, Project Cost Estimate, Financial Appleter Scheduling iect Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling iect Management Features t Control, Project Audit and Project Termination e Project Management rinciples, Agile methodologies, Relationship between Agile Scrum, | ence ion t | Relat by Cra | 5 ho ionsl shing 3 ho 3 ho | ur nip g o ur ur |
| Project Identification,Module:2ProjProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjRisk Analysis, ProjectModule:5Agil | Market and Demand Analysis, Project Cost Estimate, Financial Appleter Scheduling iect Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling iect Management Features t Control, Project Audit and Project Termination e Project Management rinciples, Agile methodologies, Relationship between Agile Scrum, | ence ion t | Relat by Cra | 5 ho ionsl shing 3 ho 3 ho | ur nip g o ur ur |
| Project Identification,Module:2ProjProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjRisk Analysis, ProjectModule:5AgilIntroduction, Agile PIT Service Manageme | Market and Demand Analysis, Project Cost Estimate, Financial Appendix Appendix Project Scheduling iect Scheduling introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling iect Management Features t Control, Project Audit and Project Termination e Project Management rinciples, Agile methodologies, Relationship between Agile Scrum, ent (ITIL). | ence ion t | Relat by Cra | 5 ho ionsl shing 3 ho 3 ho 5 ho Ops | ur ur ur |
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| Project Identification,Module:2ProjectProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjectRisk Analysis, ProjectModule:5AgilIntroduction, Agile PIT Service ManagemetModule:6ScrutVarious terminologi | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling ject Management Features t Control, Project Audit and Project Termination e Project Management rinciples, Agile methodologies, Relationship between Agile Scrum, ent (ITIL). | ence ion t | Relat | 5 ho ionsl shing 3 ho 3 ho Ops a 4 ho | ur ur ur ur |
| Project Identification,Module:2ProjectProject Scheduling, IDifference between Iactivity.Module:3CosProject Cost ControlModule:4ProjectRisk Analysis, ProjectModule:5AgilIntroduction, Agile PIT Service ManagemetModule:6ScrutVarious terminologi | Market and Demand Analysis, Project Cost Estimate, Financial Ap ject Scheduling Introduction to PERT and CPM, Critical Path Calculation, Preced PERT and CPM, Float Calculation and its importance, Cost reduct t Control and Scheduling (PERT/Cost), Resource Scheduling & Resource Levelling Ic Management Features It Control, Project Audit and Project Termination I Control, Project Audit and Project Termination I Control, Agile methodologies, Relationship between Agile Scrum, ent (ITIL). Imm I Scrum (Sprint, product backlog, sprint backlo | ence ion t | Relat | 5 ho ionsl shing 3 ho 3 ho Ops a 4 ho | ur ip g of ur ur and |





| Bui | ilds, Automated Testing and Test-Dr | iven Developmer | t, Continu | ous Integration, C | onfiguration |
|-----|---|-----------------------|----------------|-----------------------------------|--------------|
| | nagement, Continuous Deployment, Au | - | | - | - |
| | XP, FDD, DSDM, Crystal. | | | 0 0 | |
| | | | | | |
| Mo | odule:8 Contemporary issues | | | | 2 hours |
| Gu | est lecture by Industry Experts or R&D | organization | | | |
| | | | Total Le | ecture hours | 30 hours |
| Те | xt Book | | | | |
| 1. | Mike Cohn, Succeeding with Agile: S | oftware Developm | ent Using | Scrum, 2015, 1 st Edit | ion Addison- |
| _, | Wesley Professional. | 01000 m 0 2 0 0 010 p | | 2010, 1 2010 | |
| Re | ference Books | | | | |
| 1. | Roman Pichler, Agile Product Manag | gement with Scru | n: Creatin | g Products that Cus | tomers Love, |
| | 2011, First edition, Addison-Wesley. | | · | | , |
| 2. | Ken Schwaber, Agile Project Managem | ent with Scrum, 20 | 14,1st edition | on, Microsoft Press U | JS. |
| Mo | ode of Evaluation: CAT / Assignmen | | | | |
| | | - | | | |
| Lis | t of Challenging Experiments (Indica | ative) | | | |
| 1 | Estimate the IT Project Cost and Contr | rol using open-sou | rce tools | | |
| 2 | Scheduling a Project with PERT and C | PM: | | | |
| | 1. Estimation of the total time req | juired to complete | the project | if no delay | |
| | 2. The individual activities to mee | et the project compl | etion time. | | |
| | Identify the critical bottleneck activities | s where any delays | must be ave | oided to prevent delag | ying project |
| | completion. | | | | |
| 4 | IT project risk analysis using open-sour | rce tools | | | |
| 5 | Design IT Project Audit Template | | | | |
| 6 | Agile Project Management Tools (Open | n source) | | | |
| 7 | Design IT Service Management (ITIL) | , | | | |
| 8 | Scrum: IT Project Management, DevO | 1 | Testing To | ols | |
| | | • | - | al Laboratory Hour | rs 30 hours |
| Mo | de of Assessment: Assessments/Mi | d Term Lab/ FA | | · · · · · | |
| | commended by Board of Studies | 22-05-2021 | | | |
| Ap | proved by Academic Council | No. 62 | Date | 15-07-2021 | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | T | P J | C |
|--|---|-------------------------------|--------------------------|--|---|
| EEE1001 | Basic Electrical and Electronics Engineering | 2 | 0 | 2 0 | 3 |
| Pre-requisite | NIL | Sylla | | versio | n |
| Course Objectives | | | V. | 1.0 | |
| Course Objectives: | various laws and theorems applied to solve electric circuits and | natwo | rlza | | |
| | | | | Flootro | niaa |
| - | dents with an overview of the most important concepts in Elec s the basic need for every engineer | Juncar | anu r | | mes |
| Eligineering which i | s the basic need for every engineer | | | | |
| Expected Course O | utcome: | | | | |
| - | cal circuit problems using various laws and theorems | | | | |
| | circuits and networks, its measurement and safety concerns | | | | |
| | are various types of electrical machines | | | | |
| • • | nent various digital circuits | | | | |
| | cteristics of semiconductor devices and comprehend the varia | ous m | odula | ation | |
| | unication engineering | 0000 | | | |
| - | et experiments to analyze and interpret data | | | | |
| | | | | | |
| Module:1 DC | circuits | | | 5 h | ours |
| Basic circuit elemen | ts and sources, Ohms law, Kirchhoff's laws, series and parallel | l conn | ectio | n of ci | rcuit |
| | | | | | |
| elements, Node volta | ge analysis, Mesh current analysis, Thevenin's and Maximum po | | | theore | |
| | | | | | em. |
| Module:2 AC | circuits | owertra | ansfer | 6 h | m. ours |
| Module:2 AC Alternating voltages | circuits | owertra | ansfer | 6 h wer in | m. ours |
| Module:2 AC Alternating voltages a circuits-Power Factor | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three | owertra | ansfer | 6 h wer in | m. ours |
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| Module:2 AC Alternating voltages a circuits-Power Facto Measurement – Elec | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. | owertra | ansfer | 6 h wer in wer | em. ours AC |
| Module:2ACAlternating voltagesacircuits-PowerFactorMeasurement – ElectModule:3Elect | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. | owertra circuits e Phas | ansfer , Pov se Po | 6 h ver in wer 7 h | ours |
| Module:2ACAlternating voltagesacircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, Work | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. etrical Machines ing Principle and applications of DC Machines, Transformed | ers, S | , Pow , Pow se Po | 6 h wer in wer 7 h phase | ours |
| Module:2ACAlternating voltagesacircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, Work | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. | ers, S | , Pow , Pow se Po | 6 h wer in wer 7 h phase | ours |
| Module:2ACAlternating voltages a circuits-Power Factor Measurement – ElectModule:3ElectConstruction, Work Three-phase Induction | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. etrical Machines ing Principle and applications of DC Machines, Transformed | ers, S | , Pow , Pow se Po | 6 h ver in wer 7 h phase notor. | ours AC |
| Module:2ACAlternating voltagesacircuits-PowerFactorMeasurement – ElectElectModule:3ElectConstruction, WorkThree-phase InductionModule:4Dig | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. ctrical Machines ing Principle and applications of DC Machines, Transformed on motors, Special Machines-Stepper motor, Servo Motor an | ers, Sind BL | ingle | 6 h ver in wer 7 h phase notor. 5 h | ours AC ours and ours |
| Module:2ACAlternating voltagesacircuits-PowerFactorMeasurement – ElectElectModule:3ElectConstruction, WorkThree-phase InductionModule:4Dig | circuits nd currents, AC values, Single Phase RL, RC, RLC Series c or- Three Phase Systems – Star and Delta Connection- Three trical Safety –Fuses and Earthing, Residential wiring. trical Machines ing Principle and applications of DC Machines, Transforme on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- | ers, Sind BL | ingle | 6 h ver in wer 7 h phase notor. 5 h | ours AC ours and ours |
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VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)



| Refe | rence Books: | |
|------|--|------------|
| 1. | Allan R. Hambley, 'Electrical Engineering -Principles & Applications' Pearson Education | ion, First |
| | Impression, 6/e, 2013 | |
| 2. | Simon Haykin, 'Communication Systems', John Wiley & Sons, 5 t h Edition, 2009. | |
| 3. | Charles K Alexander, Mathew N O Sadiku, 'Fundamentals of Electric Circuits', Tata McGrav | w Hill, |
| | 2012. | |
| 4. | Batarseh, 'Power Electronics Circuits', Wiley, 2003 | |
| 5. | H. Hayt, J.E. Kemmerly and S. M. Durbin, 'Engineering Circuit Analysis', 6/e, Tata McC | Graw Hill, |
| | New Delhi, 2011. | |
| 7. | Fitzgerald, Higgabogan, Grabel, 'Basic Electrical Engineering', 5t h edn, McGraw Hill, 2009. | |
| 8. | S.L.Uppal, 'Electrical Wiring Estimating and Costing ', Khanna publishers, NewDelhi, 2008. | |
| | | |
| | e of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| | of Challenging Experiments (Indicative) | |
| 1. | Thevenin's and Maximum Power Transfer Theorems – Impedance matching of source and | 3 hours |
| | load | |
| 2. | Sinusoidal steady state Response of RLC circuits | 3 hours |
| 3. | Three phase power measurement for ac loads | 3 hours |
| 4. | Staircase wiring circuit layout for multi storey building | 3 hours |
| 5. | Fabricate and test a PCB layout for a rectifier circuit | 3 hours |
| 6. | Half and full adder circuits. | 3 hours |
| 7. | Full wave Rectifier circuits used in DC power supplies. Study the characteristics of the semiconductor device used | 3 hours |
| 8. | Regulated power supply using zener diode. Study the characteristics of the Zener diode used | 3 hours |
| 9. | Lamp dimmer circuit (Darlington pair circuit using transistors) used in cars. | 3 hours |
| 7. | Study the characteristics of the transistor used | 5 nouis |
| 10. | Characteristics of MOSFET | 3 hours |
| 10. | Total Laboratory Hours | 30 hours |
| | | JUNUUD |
| Mod | le of assessment: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| | ommended by Board of Studies 29-05-2015 | |
| App | roved by Academic Council No. 37 Date 17-06-2015 | |





| Course Co | ae | | Course Tit | | | L | Т | P | J | С |
|--|--|--|--|---|--|------------------------------|---|---|--|--|
| MAT1004 | 4 | | Discrete Mathe | matics | | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | N | NIL | | | | Syl | | | ersion | 1 |
| ~ ~ ~ ~ ~ | | | | | | | | v. 1. | 0 | |
| Course Object | | | | | | | | | | |
| The aim of this | | | | | | | | | | |
| | | | elations and grou | ps concepts for a | nalyzing | g pro | blen | ns th | at ar | ise 1 |
| engineering | | | | | | | | | | |
| | • | - | ns connected with | combinatorics and | Boolea | n alg | ebra. | | | |
| 3 To solve calc | ulus and ir | ntegral calcu | lus problems. | | | | | | | |
| Expected Cou | na Autoo | m 0 | | | | | | | | |
| | | | hould be able to | | | | | | | |
| | | | unctions and relation | ons | | | | | | |
| 2. Understand t | • 1 | - | | | | | | | | |
| 3. Understand t | - | | • | | | | | | | |
| | _ | | heory and its appli | cations. | | | | | | |
| | - | 01 | . Using these conce | | roblems | | | | | |
| 6 6 | | | 6 | r | | | | | | |
| Module:1 | Set, Fun | ation and D | | | | | | | _ 1 | |
| | | споп апа к | lelation | | | | | | 51 | hou |
| Introduction to | / | | | of sets – Princip | le of ind | clusio | on an | nd ex | | hour on – |
| | set – Sub | oset – Types | of set – Operation | | | | | | clusi | on – |
| Laws of set th | set – Suba neory – Fr | oset – Types | | | | | | | clusi | on – |
| | set – Suba neory – Fr | oset – Types | of set – Operation | | | | | | clusi | on – |
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B. Tech Computer Science and Engineering and Business Systems

tables, validity and satisfiability, tautology; Adequate set of connectives; Equivalence and normal forms; Compactness and resolution; Formal reducibility - natural deduction system and axiom system; Soundness and completeness

Module:7Boolean Algebra5 hoursIntroduction of Boolean algebra, truth table, basic logic gate, basic postulates of Boolean algebra, principle
of duality, canorical form, Karnaugh map.5 hours

Module:8 Contemporary Issues Industry Export Leasture Industry Export Leasture

Industry Expert Lecture

| | | Το | tal Lectu | re hours: | 45 hours |
|------|---|-----------------------|------------|---------------|-----------------------|
| Text | : Book(s) | | | | |
| 1. | I. N. Herstein, "Topics in Algebra", Jo | ohn Wiley and Son | s. | | |
| 2. | M. Morris Mano, "Digital Logic & Co | omputer Design", I | Pearson. | | |
| 3. | C. L. Liu, "Elements of Discrete Math | nematics:, second e | dition, Li | uMcGraw I | Hill, New Delhi. |
| 4. | J. A. Bondy and U. S. R. Murty, "Gra | ph Theory with Ap | plications | s ", Macmil | lan Press, London. |
| 5. | L. Zhongwan, "Mathematical Logic for | or Computer Science | ce ", Wor | ld Scientific | c, Singapore |
| Refe | erence Books | | | | |
| 1. | Gilberft Strang, "Introduction to Line | ar Algebra". | | | |
| 2. | R. A. Brualdi, "Introductory Combina | atorics", , North-He | olland, Ne | ew York. | |
| 3. | N. Deo, "Graph Theory with Applica | ations to Engineering | ng and Co | omputer Sci | ence", Prentice Hall, |
| | Englewood Cliffs. | | | | |
| 4. | E. Mendelsohn, "Introduction to Mat | hematical Logic, (| Second E | dition)", Va | an-Nostrand, London. |
| | | | | | |
| Mod | le of Evaluation: CAT/Quiz/Digita | l assignment, Sen | ninar and | l FAT | |
| Reco | ommended by Board of Studies | 16-02-2019 | | | |
| App | roved by Academic Council | No. 56 | Date | 24-09-20 | 19 |

2 hours





| Course Code | Course Title | L | Т | P | J | C |
|--|--|-------|-------------------|--------|--|----------------------------------|
| MAT2004 | Linear Algebra | 3 | 2 | 0 | 0 | 4 |
| Pre –requisite | Discrete Mathematics | S | yllabı | us Ve | ersior | 1 |
| ~ ~ ~ ~ ~ | | | | v. 1.(|) | |
| Course Objectives: | | | | | | |
| The aim of this course | | | 1. | | | c |
| | solution of system of linear equations, vector space and or | hoge | onality | y con | icepts | s to |
| | s that arise in engineering and physical sciences. | | | | | |
| 1 0 | alyze the problems connected Eigen value, Hermitian an | d Ui | nitary | line | ar | |
| transformations. | | | | | | |
| 3. Is to solve QR an | d LU decomposition and to learn the applications of line | ear a | lgebra | a in (| comp | ute |
| science. | | | | | | |
| | 4 | | | | | |
| Expected Course Ou At the end of the cour | se the student should be able to | | | | | |
| | s types of matrix, determinant and its properties. | | | | | |
| | cepts of system of linear equations and solving by various m | etho | ds | | | |
| | cepts of vector space, subspace and basis. | cuio | us. | | | |
| | | • | | | | |
| | cepts of orthogonality, Hermitian and unitary transformation | | | | | |
| . Learning the applic | ations in Image processing, Machine learning and Cryptograp | ony. | | | | |
| Module:1 Ma | trices and Determinants | | | | 4 h | oui |
| ntroduction to Matric | ees-Types of Matrices-Determinants-Properties-Rank | ofa | Matrix | x. | | |
| | tem of Linear Equations | | | | 4 h | |
| Modulo•? Svs | | | wand | inco | | |
| | uations – Cramer's rule – Matrix inversion method – Consis | stenc | | meo | 115150 | |
| • | uations – Cramer's rule – Matrix inversion method – Consis | stenc | y and | | | |
| Solutions of linear equiperior | | stenc | | | 7 h | |
| Solutions of linear equations of linear equati | Decompositions | | | | 7 h | |
| Solutions of linear equations of linear equati | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem | | | | | |
| Solutions of linear equinethod. Module:3 LU Gaussian elimination - Matrices – LU Decon | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elen nposition. | | | | s – B | loc |
| Solutions of linear equinethod. Module:3 LU Gaussian elimination - Matrices – LU Decon | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces | nenta | iry ma | ıtrice | s – B 9 he | loc |
| Solutions of linear equinethod. Module:3 LU Gaussian elimination - Matrices – LU Decon Module:4 Vec Vector space – Sub sp | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elen nposition. | nenta | iry ma | ıtrice | s – B 9 he | loc |
| Solutions of linear equinethod. Module:3 LU Gaussian elimination - Matrices – LU Decon Module:4 Vec Vector space – Sub sp of sub space – Interpo | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces pace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. | nenta | iry ma | ıtrice | s – B 9 he imen | oui sio |
| Solutions of linear equation nethod. Module:3 LU Gaussian elimination - Matrices – LU Decond Module:4 Vec Vector space – Sub sp of sub space – Interpo Module:5 Ort | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces bace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. | nenta | ry ma - Basis | s – D | s – B 9 he imen 6 he | our sio |
| Solutions of linear equation nethod. Module:3 LU Gaussian elimination - Matrices – LU Decond Module:4 Vec Vector space – Sub sp of sub space – Interpo Module:5 Ort | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces pace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. | nenta | ry ma - Basis | s – D | s – B 9 he imen 6 he | oui sio |
| Solutions of linear equations Nodule:3 LU Gaussian elimination - Matrices – LU Decons Module:4 Vec Vector space – Sub spot of sub space – Interpo Module:5 Ort Orthogonality – Projeransformations. | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces bace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. | nenta | ry ma - Basis | s – D | s – B 9 he imen 6 he | bur sio |
| Solutions of linear equations Nodule:3 LU Gaussian elimination - Matrices – LU Decons Module:4 Vector Vector space – Sub sport of sub space – Interport Module:5 Ort Orthogonality – Project Solutions. Module:6 Her Eigen values – Eigen | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. etor Spaces bace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. thogonality ection – Gram Schmidt orthogonalization – QR decompo | ion – | - Basis n – Is | s – D | s – B 9 ha imen 6 ha try lin 7 ha | Dul Sio |
| Solutions of linear equations Nodule:3 LU Gaussian elimination - Matrices – LU Decons Module:4 Vec Vector space – Sub spot of sub space – Interpo Module:5 Ort Orthogonality – Projeransformations. Module:6 Her | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. ctor Spaces bace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. chogonality ection – Gram Schmidt orthogonalization – QR decompo rmitian and Unitary Linear Transformations | ion – | - Basis n – Is | s – D | s – B 9 ha imen 6 ha try lin 7 ha | Dul Sio |
| Solutions of linear equations Nodule:3 LU Gaussian elimination - Matrices – LU Decond Module:4 Vector Vector space – Sub spot of sub space – Interpo Module:5 Ort Orthogonality – Projeransformations. Module:6 Her Eigen values – Eigen Transformations. | Decompositions - Gauss Jordan method to find the inverse of a matrix – Elem nposition. ctor Spaces bace – Linearly independent – linearly dependent – Dimens lating polynomial vectors – Co –ordinate vectors. chogonality ection – Gram Schmidt orthogonalization – QR decompo rmitian and Unitary Linear Transformations | ion – | - Basis n – Is | s – D | s – B 9 ha imen 6 ha try lin 7 ha | loci our sio our nea |





| Mad | I10 | Contanto a successive de la contra de la con | | | | 2 h |
|-------|---------------|--|-----------------------------------|--------------|------------------|------------------------------|
| | lule:8 | Contemporary Issues | | | | 2 hours |
| Indu | stry Expert | Lecture | T | | | 451 |
| | | | | | ire hours: | 45 hours |
| | | nimum of five problems to | | | | 15 hours |
| Tutor | rial Class. A | nother five problems per tuto | orial class to be giv | en as home | e work. | |
| | | | | | | |
| Text | Book(s) | | | | | |
| 1. | Jin Ho Kw | ak and Snngpyo Hong, Line | ar Algebra, Second | l Edition, S | Springer (2004). | |
| 2. | Bernard K | olman and David R. Hill, Int | troductory Linear A | Algebra – A | An Applied Cour | se, 9 th Edition, |
| | Pearson E | ducation, 2011. | - | - | | |
| Refe | rence Book | S | | | | |
| 1. | Gilbert Stra | ang, Introduction to linear alg | gebra, 4 th Edition, A | Academic | Press. | |
| 2. | Howard Ar | nton and Robert C Busby, Co | ontemporary Linear | Algebra, . | John Wiley (2003 | 3). |
| 3. | R C Gonza | lez and R E Woods, Digital | Image Processing. | | | |
| 4. | https://ma | chinelearningmastery.com/ii | ntroduction –matri | ces –mach | ine –learning/ | |
| | 1 | | | | | |
| Mod | le of Evalua | tion: CAT, Quiz, Digital a | ssignment, Semir | nar and F | AT | |
| Reco | ommended | by Board of Studies | 16-02-2019 | | | |
| App | roved by A | cademic Council | No. 56 | Date | 24-09-2019 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course code | Course Title | L | Т | Р | J | С |
|---|---|-------|--------|--------|-------|------|
| MAT2005 | Data Science and Statistical Modelling | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | MAT 1017 | | Syllat | | | n |
| ~ | | | | v. 1.0 |) | |
| Course Objectives | | | | | | |
| | e of statistics in business | | | | | |
| - | edge on collection, analysis and presentation of data | | | | | |
| • | outions and relationships of real-time data. | | | | | |
| | ation and testing methods to make inference and modeling to | echn | iques | for | decis | 10n |
| making. | | | | | | |
| Expected Course | Outcome: After completing the course, the student should be a | hla t | 0 | | | |
| 1. Present and analy | | bie t | 0 | | | |
| 2. Solve problems o | | | | | | |
| 3. Interpret statistica | | | | | | |
| 4. Design and analy | | | | | | |
| e . | pplications of statistical methods in science and engineering | | | | | |
| | atistical analysis to experimental data | | | | | |
| | | | | | | |
| Module:1 | Linear Statistical Models | | | | 4 ho | ours |
| | ssion & correlation, multiple regression & multiple correlation | | | | | |
| | , | | | | | |
| Module:2 | Estimation | | | | 6 ho | ours |
| Point estimation, cr | iteria for good estimates (un-biasedness, consistency), Methods | of e | stima | tion i | ncluc | ling |
| maximum likelihoo | d estimation. | | | | | |
| | | | | | | |
| Module:3 | Sufficient Statistic | | | | 4 ho | ours |
| Concept & example | es, complete sufficiency, their application in estimation | | | | | |
| Module:4 | Test of hypothesis | | | | 8 ha | ours |
| | lation, Type I and Type II errors, Neyman Pearson lemma, | Pro | cedur | es of | | |
| – | e (one way, two way with as well as without interaction) | | | | | 0, |
| | | | | | | |
| Module:5 | Non-parametric Inference | | | | 6 ho | ours |
| Comparison with pa | arametric inference, Use of order statistics. Sign test, Wilcoxon si | igne | d rank | test, | Man | n- |
| Whitney test, Run te | est, Kolmogorov-Smirnov test. Spearman's and Kendall's test. | | | | | |
| | | | | | • • | |
| Module:6 | Expert Lecture | | | | | ours |
| | Total Lecture hour | rs: | | | 30 ho | ours |
| | | | | | | |
| Text Books | d Chatiatian for Engineers (Ath Edition) ID Million IE E. 1 | | | | | |
| • | nd Statistics for Engineers (4th Edition), I.R. Miller, J.E. Freund and Statistics (Vol. 1, & Vol. 11), A. Coop, M. Cypta and P. Door | | K. Joi | inson | • | |
| 2. Fundamentals | s of Statistics (Vol. I & Vol. II), A. Goon, M. Gupta and B.Dasgu | upta | | | | |
| 3. The Analysis | of Time Series: An Introduction, Chris Chatfield | | | | | |
| | | | | | | |



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CURRICULUM (2022 - 2023)

| 0 | | |
|------|--|---------|
| Refe | erence Books | |
| 1. | Introduction to Linear Regression Analysis, D.C. Montgomery & E.Peck | |
| 2. | Introduction to the Theory of Statistics, A.M. Mood, F.A. Graybill& D.C. Boes. | |
| 3. | Applied Regression Analysis, N. Draper & H. Smith | |
| 4. | Hands-on Programming with R,- Garrett Grolemund | |
| 5 | R for Everyone: Advanced Analytics and Graphics, Jared P. Lander | |
| 6 | Data Source: www.rbi.org.in | |
| | | |
| List | of Experiments | |
| 1. | Introduction to R software Understanding Data types; importing/exporting data. | 1 hours |
| 2. | Computing Summary Statistics /plotting and visualizing data using Tabulation and Graphical Representations. | 2 hours |
| 3. | Applying correlation and simple linear regression model to real dataset; computing and interpreting the coefficient of determination | 1 hours |
| 4. | Applying multiple linear regression model to real dataset; computing and interpreting the multiple coefficient of determination | 2 hours |
| 5. | Testing of hypothesis for One sample mean and proportion from real-time problems. | 1 hours |
| 6. | Testing of hypothesis for Two sample mean and proportion from real-time problems | 2 hours |
| 7. | Performing ANOVA for real dataset for Randomized Block design | 2 hours |
| 8. | Latin square Design | 1 hours |
| 9. | Non parametric Sign test and Wilcoxon signed rank test | 2 hours |
| 10. | Mann-Whitney test | 1 hours |
| N/ | le of Englishing Agging monte Onig Continues Aggente Service 1 DAT | |
| | le of Evaluation: Assignments, Quiz, Continuous Assessments, Seminar and FAT | |
| | ommended by Board of Studies 16-02-2019 newsid her Academic Correction No. 5(| |
| Арр | roved by Academic Council No.56 Date 24-09-2019 | |





| Course Co | ode Course Title | L | Τ | P | J | C |
|------------------|--|---------------|--------|-------------|---------|-------|
| MGT10 | 8 | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | NIL | | Sy | | s ver | sion |
| | • | | | v. 1 | .0 | |
| Course Object | | | | | | |
| | an awareness about the importance and usefulness of the acc | ounting | conc | epts | and | then |
| U U | l implications | | | | | |
| | p an understanding of the financial statements and the underly | ving prir | ciple | es an | d lea | rn to |
| interpret f | nancial statements | | | | | |
| 3. To create a | an awareness about cost accounting, different types of costing an | d cost n | nanag | gemen | nt | |
| E | 0.4 | | | | | |
| Expected Cou | | | | | | |
| 1 | tion of the course, student should be able to budding Technocrat Managers to understand the Financial Acc | ounting | Conc | onte | | |
| | e accounting transactions leading to final statement of accounts | ounning | Conc | epis | | |
| | e Annual Reports | | | | | |
| • | e FFS and CFS | | | | | |
| - | | ~ ~ ~ ~ ~ ~ ~ | - | | - daat | ~ |
| 5. Understand | the Costing concepts and make decisions using Marginal costing | ig conce | pis a | na di | laget | 5 |
| Module:1 | Introduction | | | | 2 h | ours |
| Accounting Co | ncept: Introduction, Techniques and Conventions, Financial St | atements | s- Un | ders | tandi | ng & |
| | ancial Statements | | | | | U |
| | | | | | | |
| Module:2 | Accounting Process | | | | | ours |
| | and Record Maintenance, Fundamental Principles and Double E Book and Subsidiary Books, Rectification of Errors. | intry, Jo | urnal | , Led | lger, ' | Trial |
| Module:3 | Financial Statements | | | | 12 h | ours |
| | ents of Financial Statements- Trading and Profit and Loss Acc | ount B | lanc | e She | | |
| | sing and Interpreting Financial Statements, Accounting Standard | | iiuiie | c bii | | . ma |
| | | | | | | |
| Module:4 | Company Accounts | | | | 3 h | ours |
| | and Statutory Requirements (in the context of Annual Reports) | | | eport | , Not | es to |
| Accounts, Pitfal | ls. Class Discussion: Corporate Accounting Fraud A Case Study | of Satya | m | | | |
| Module:5 | Cash and Fund Flow | | | | 8 h | ours |
| | ow to prepare, Difference between them | | | | 011 | Jui |
| 1111000001011,11 | | | | | | |
| Module:6 | Costing Systems | | | | 6 h | ours |
| | ost, Cost Behavior, Cost Allocation, OH Allocation, Unit Cost | sting, Pr | oces | s Co | sting, | , Job |
| | tion Costing, ABC Analysis. | | | | | |
| Class Discussio | n: Application of costing concepts in the Service Sector | | | | | |
| Module 7 | Decision Making using costing | | | | 8 h | ours |
| | g -Cost Volume Profit Analysis-Budgets | I | | | | |
| | | | | | 451 | our |
| | Total Lecture ho | mre• | | | /15 m | |



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CURRICULUM (2022 - 2023)

| Tex | t Book(s) | | | |
|-----|--|---------------------|---------------|---------------------------------|
| 1. | Robert N Anthony, David Hawkins, I | Kenneth Marchant | t, Accounting | g: Texts and Cases, McGraw-Hill |
| 2. | Case Study Materials: To be distribute | ed for class discus | sion | |
| Ref | erence Books | | | |
| 1. | Advanced Accounting by RL Gupta a | nd Radhaswamy | | |
| 2. | Advanced Accounting by MC Shukla | and Grewal | | |
| | • | | | |
| | de of Evaluation: CAT / Assignmer | nt / Quiz / FAT | | |
| Rec | commended by Board of Studies | 07-06-2019 | | |
| App | proved by Academic Council | No. 55 | Date | 13-06-2019 |





| | e | Course Title L | Т | P | J | С |
|--|--|--|---------------------------------------|--|---|---|
| MGT 1065 | | Fundamentals of Management3 | 0 | 0 | 0 | 3 |
| Pre-requisite | | NIL | Sylla | | | sion |
| | | | | v. 1.0 |) | |
| | | levelop the ability to | • | | | |
| | anagem | nent theories, evolution of management over the years and ba | asics | conc | cept | s of |
| Management. | | | | | | |
| - | | ing about how organizations work | | | | |
| 3. Exipore the intri | cacies o | of different management areas such as finance, marketing, strateg | gy etc | | | |
| Expected Course | o Autor | | | | | |
| - | | asic theoretical concepts of Management and Organisational Beh | oviou | r | | |
| • | | king the concepts with contemporary issues | laviou | 1 | | |
| 0 | | anagement problems, analyse them, and find solutions | | | | |
| | | oss-cultural competencies by working in teams. | | | | |
| | | | | | | |
| J.Develop manage | zitat SKI | lls needed to become an effective manager. | | | | |
| Module:1 | Manag | gement Theories | | | <mark>8 h</mark> a | mr |
| | | ons of Management, Evolution of Management Thought | ts [P | | | |
| | | 1880), Classical management Era (1880-1930), Neo-classical | | | | |
| | | anagement era (1950-on word). Contribution of Management | | | | |
| Fayol, Elton Mayo | | | | | 100 | 101 |
| | | | | | | |
| | | ions of Management | | (| 6 ho | ours |
| | | | | | | |
| Planning, Organiz | ing, Sta | ffing, Directing, Controlling | | | | |
| | | | | | 6 ha | |
| Module:3 | Organ | ization Behavior | ress N | | 6 ho | |
| Module:3 Introduction, Pers | Organ sonality | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str | ress N | | | |
| Module:3 Introduction, Pers | Organ sonality | ization Behavior | ress N | | | |
| Module:3 Introduction, Pers Decision Making, | Organ sonality Probler | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making | ress N | Iana | gem | ent |
| Module:3 Introduction, Pers Decision Making, Module:4 | Organ sonality Probler Organ | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design | | fana; | gem 6 ho | ours |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas | Organ sonality Probler Organ ssical a | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza | tional | Iana; | gem 6 ho ory | ent ours and |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas design, Organiza | Organ sonality Probler Organ ssical a | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design | tional | Iana; | gem 6 ho ory | ent ours and |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas | Organ sonality Probler Organ ssical a | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza | tional | Iana; | gem 6 ho ory | ent ours and |
| Module:3Introduction, PersDecision Making,Module:4Classical, Neoclasdesign, OrganizatStructure) | Organ sonality Probler Organ ssical at tional s | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza | tional | fanag theo ture, | gem 6 ho ory | ours and trix |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas design, Organiza Structure) Module:5 | Organ sonality Probler Organ ssical as tional s | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure) | tional Struc | Ianag theo ture, | gem 6 ho ory Ma | ours and trix |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas design, Organiza Structure) Module:5 | Organ sonality Probler Organ ssical as tional s | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure) ation &Organisational culture | tional Struc | Ianag theo ture, | gem 6 ho ory Ma | ours and trix |
| Module:3Introduction, PersDecision Making,Module:4Classical, Neoclasdesign, OrganizaStructure)Module:5Motivation, Group | Organ sonality Probler Organ ssical as tional s Motiva p Dynar | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure) ation &Organisational culture | tional Struc | fanag theo ture, 0 | gem 6 ho ory Ma | ent ours and trix |
| Module:3Introduction, PersDecision Making,Module:4Classical, Neoclasdesign, OrganizaStructure)Module:5Motivation, GroupModule:6 | Organ sonality Probler Organ ssical at tional s Motiva p Dynai | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Divisional Structure, Divisional Structure, Divisional Structure, Divisional Structure, Nanaging Cult | tional Struct | fanag theo ture, 6 Diver | gem 6 ho Dry Ma 5 ho sity | ent ours and trix |
| Module:3Introduction, PersDecision Making,Module:4Classical, Neoclasdesign, OrganizaStructure)Module:5Motivation, GroupModule:6Ethics and Busin | Organ sonality Probler Organ ssical as tional s Motiva p Dynar Manag ess, Etl | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Structure, Functional Structure, Divisional Structure, Nanaging Cult ntion &Organisational culture nics, Power & Influence, Organizational Culture, Managing Cult gerial Ethics | tional Struct tural I nting, | fanag theo ture, 0 Diver | gem 6 ho ory Ma 5 ho sity 5 ho | ours ours ours ours ours |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclass design, Organizat Structure) Module:5 Motivation, Group Module:6 Ethics and Busin making framewor | Organ sonality Probler Organ ssical at tional s Motiva p Dynar Manag ess, Eth ks, Bus | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Divisional Structure, Nanaging Cult ation &Organisational culture mics, Power & Influence, Organizational Culture, Managing Cult gerial Ethics mics of Marketing & advertising, Ethics of Finance & Accourt | tional Struct tural I nting, | fanag theo ture, 0 Diver | gem 6 ho ory Ma 5 ho sity 5 ho | ent ours and trix ours ours |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas design, Organizat Structure) Module:5 Motivation, Group Module:6 Ethics and Busin making framewor Corporate Citizens | Organ sonality Probler Organ ssical at tional s Motiva p Dynar Manag ess, Etl ks, Bus ship, Co | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Structure, Functional Structure, Divisional Structure, Divisional Structure, Nanaging Cult nics, Power & Influence, Organizational Culture, Managing Cult gerial Ethics nics of Marketing & advertising, Ethics of Finance & Account iness and Social Responsibility, International Standards, Corporte orporate Social Responsibility | tional Struct tural I nting, | fanag theo ture, for Diver | gem 6 ho Dry Ma 5 ho Sity 5 ho Cisio | ent ours and trix ours n – nce, |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclass design, Organizat Structure) Module:5 Motivation, Group Module:6 Ethics and Busin making framewor Corporate Citizens | Organ sonality Probler Organ ssical at tional s Motiva p Dynar Manag ess, Eth ks, Bus ship, Co Leade | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design ind Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Organizational Culture mics, Power & Influence, Organizational Culture, Managing Cult gerial Ethics nics of Marketing & advertising, Ethics of Finance & Account iness and Social Responsibility, International Standards, Corporate Social Responsibility | tional Struct tural I nting, | fanag theo ture, Diver | gem 6 ho ory Ma 5 ho sity 5 ho | ent ours and trix ours n – nce, |
| Module:3 Introduction, Pers Decision Making, Module:4 Classical, Neoclas design, Organiza Structure) Module:5 Motivation, Group Module:6 Ethics and Busin making framewor Corporate Citizens | Organ sonality Probler Organ ssical at tional s Motiva p Dynar Manag ess, Eth ks, Bus ship, Co Leade | ization Behavior , Perception, Learning and Reinforcement, Work Stress and Str ns in Decision Making, Decision Making izational Design nd Contingency approaches to organizational design; Organiza tructure (Simple Structure, Functional Structure, Divisional Structure, Structure, Functional Structure, Divisional Structure, Divisional Structure, Nanaging Cult nics, Power & Influence, Organizational Culture, Managing Cult gerial Ethics nics of Marketing & advertising, Ethics of Finance & Account iness and Social Responsibility, International Standards, Corporte orporate Social Responsibility | tional Struct tural I nting, | fanag theo ture, Diver | gem 6 ho Dry Ma 5 ho Sity 5 ho Cisio | our: and trix |





| | dule:8 | Contemporary issues | | | | 2 hours |
|-----|---------------|---------------------------------|---------------------|------------------------|-----------------|-----------------|
| Con | temporary is: | sues in Management | | | | |
| Lab | Experimen | its: NIL | | | | |
| | | | Te | otal Lectu | re hours: | 30 hours |
| | | | | | | |
| Tex | t Book(s) | | | | | |
| 1. | Richard L. | Daft, Understanding the The | eory and Design of | [°] Organizat | ions | |
| 2. | Stephen P. | Robbins, Timothy A. Judge, | Neharika Vohra, O | Organizatic | onal Behavior | |
| 3. | Harold Ko | ontz, Essentials of Managem | ent | | | |
| Ref | erence Bool | KS | | | | |
| 1. | Cyril J. O | 'Donnell and Harold Koon | tz, Principles of M | Manageme | ent: An Analysi | s of Managerial |
| | Functions | | | | | |
| 2. | Arnold Ba | kker, Positive Interventions in | n Organizations | | | |
| 3. | Journals- A | Academy of Management Jour | rnal, Journal of Ma | nagement, | HBR | |
| | 1 | | | | | |
| Mo | de of Evalu | ation: CAT / Assignment | /Quiz/FAT/La | ab | | |
| Rec | ommended | by Board of Studies | 07-06-2019 | | | |
| App | proved by A | cademic Council | No. 55 | Date | 13-06-2019 | |





| Course Code | Course Title | L | Τ | P | J | C |
|--|---|----------|----------|--------|----------------|------|
| MGT2002 | Marketing Research & Marketing Management | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | NIL | <u> </u> | U U | | vers | ion |
| <u>C</u> Oh! | | | | v. 1.(|) | |
| Course Objectives: | and the need of study of Marketing and Marketing Descende | | | | | |
| - | and the need of study of Marketing and Marketing Research | | | | | |
| | skill into real world problems | | | | | |
| 3. Utilize marketing m | anagement tools for competitive advantage | | | | | |
| Expected Course Ou | tcome: | | | | | |
| 1. Understand basic | marketing concepts | | | | | |
| 2. Comprehend the | dynamics of marketing and analyze how its various compone | ents i | intera | ict w | ith e | ach |
| other in the real v | vorld | | | | | |
| 3. Leverage marketing | ng concepts for effective decision making | | | | | |
| 4. Understand basic | concepts and application of statistical tools in marketing resear | ch | | | | |
| | | | | | | |
| Module:1 Mark | teting Concepts | | | | 8 ho | urs |
| Marketing Concepts an | nd Applications: Introduction to Marketing & Core Concepts, | Mark | ceting | g of S | Servi | ces, |
| Importance of market | ing in service sector. Marketing Planning & Environment: E | lem | ents o | of M | arke | ting |
| Mix, Analyzing need | s & trends in Environment - Macro, Economic, Political | . Te | chnic | al 8 | z So | cial |
| | onsumer: Determinants of consumer behavior, Factors i | | | | | |
| - | entation: Meaning & Concept, Basis of segmentation, selectio | | | - | | |
| - | es, Target Marketing, Product Positioning | 11 01 | segn | ients | , IVI a | INCI |
| Segmentation strategi | es, Target Markening, Troduct Toshtonning | | | | | |
| Module:2 Prod | uct Decisions | | | | 6 ho | urs |
| Product Management | Product Life cycle concept, New Product development & st | rateg | gy, St | ages | in N | Jew |
| - | Product decision and strategies, Branding & packaging | | | U | | |
| | | | | | | |
| | , Place and Promotion Decisions | | | | 6 ho | urs |
| Pricing, Promotion an | nd Distribution Strategy: Policies & Practices – Pricing Me | thod | s & | Price | 9 | |
| determination Policies. | Marketing Communication - The promotion mix, Advertising | & P | ublic | ity, 5 | 5 M's | s of |
| Advertising Manageme | ent. Marketing Channels, Retailing, Marketing Communication, | Adv | ertisi | ng. | | |
| | | | 1 | | | |
| | teting Research | | <u> </u> | | <u>6 ho</u> | |
| U | ntroduction, Type of Market Research, Scope, Objectives & I | | | | | c |
| | , Survey Questionnaire design & drafting, Pricing Resear | ch, | Medi | ia Ro | esear | ch, |
| Qualitative Research. | | | | | | |
| Module:5 Mark | teting Research & Data Analysis | | 1 | | 6 ho | urs |
| | z Data Analysis: Use of various statistical tools – Descriptive | & In | feren | ce S | | |
| - | Festing, Multivariate Analysis - Discriminant Analysis, Cluster | | | | | |
| and Positioning, Facto | | | | ~~5 | | 8 |
| | | | | | | |
| Module:6 Intern | net Marketing | | | | 6 ho | lire |
| International In | | | | | J 110 | u1 3 |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | | ting: Introduction to Internet | - | Mapping fundan | nental concepts of N | Aarketing (7Ps, |
|------|--------------|--------------------------------|----------------|--------------------|-----------------------|------------------|
| ST | P); Strategy | and Planning for Internet Ma | arketing. | | | |
| Mo | odule:7 | B2B Marketing | | | | 5 hours |
| Bu | siness to B | usiness Marketing: Funda | mental of bu | siness markets | . Organizational b | uying process. |
| Bu | siness buyer | needs. Market and sales po | tential. Produ | act in business r | narkets. Price in bu | siness markets |
| Pla | ce in busin | ess markets. Promotion in l | ousiness marl | kets. Relationsh | ip, networks and c | ustomer |
| rela | ationship ma | nagement. Business to Busir | ness marketing | g strategy. | | |
| | | | | | | |
| Mo | odule:8 | Contemporary issues | | | | 2 hour |
| Cor | ntemporary | topics in marketing | | | L | |
| | | | | Tot | al Lecture hours: | 45 hours |
| | xt Book(s) | | | | | |
| 1. | e | Management (2019), Philip | | | | |
| 2. | • | Management (2019), Deepal | | | | |
| 3. | Marketing | Management: A relationship | o approach (20 | 019), Hollensen, | S, Pearson Education | on. |
| 4. | Marketing | research: An applied appro- | ach (2019), M | Ialhotra, N. K., | Nunan, D., & Birks | , D. F. ,Pearson |
| | Education | Limited. | | | | |
| Ref | ference Bo | oks | | | | |
| 1. | Marketing | research: Text and cases (20 | 20), Nargund | kar, R, McGraw | -Hill Education. | |
| 2. | Marketing | management: A cultural per | spective (2020 |)), Visconti, L. N | M., Peñaloza, L., & T | Foulouse, N. |
| | (Eds.) Rou | tledge. | | | | |
| | I | | | | | |
| | | uation: CAT / Assignme | | | | |
| | | d by Board of Studies | 29-01-2021 | | | |
| Ap | proved by . | Academic Council | No. 61 | Date | 18-02-202 | 21 |



Villore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

| | de | | L T | Р | J | C |
|---|---|--|---|--|--|---|
| MGT200. | 3 | Financial Management 3 | | 0 | 0 | 3 |
| Pre-requisite | | NIL | Syl | abus | | ion |
| | | | | v. 1.0 | | |
| Course Object | | | | | | |
| | | umental concepts of financial management | | | | • . |
| | | cepts such as time value of money, cost of capital, risk and re | turn, w | orkin | g cap | ita |
| 0 | · • | budgeting etc. | | | | |
| 3. Leverage the | concept | for deciding financial angle of IT projects | | | | |
| Expected Cour | rso Aut | come. | | | | |
| Students will be | | | | | | |
| | | ng Technocrat Managers to understand the Financial Manager | ment co | ncep | ts and | d te |
| | | pts of "time value of money" in the decision-making process. | | | | |
| | - | es and know the concept of Risk and return | - | | | |
| | | erage", "cost of capital" and the projects using the Capital bud | lgeting | conce | pts | |
| | | pital components, their implications and Working Capital requ | | | r | |
| | | the Components of Working Capital. | | | | |
| | | | | | | |
| Module:1 | Introd | uction | | | 2 ho | ur |
| Introduction: I | Introduc | tion to Financial Management - Goals of the firm - Financial I | Enviror | ment | s. Ti i | me |
| Value of Money | v: Simp | le and Compound Interest Rates, Amortization, Computing mo | .1 | | | |
| | | ie and Compound interest Rates, Amortization, Computing int | ore than | once | a ye | ar, |
| | | ie and Compound interest Kates, Amortization, Computing inc | ore than | once | a ye | ar, |
| Annuity Factor. | | ie and Compound Interest Rates, Amortization, Computing inc | ore than | once | a ye | ar, |
| | • | tion of Securities / Risk & return | bre than | | a ye 10 ho | |
| Annuity Factor. Module:2 Valuation of Se | Valuat ecurities | | |] | 10 ho | ur |
| Annuity Factor. Module:2 | Valuat ecurities | tion of Securities / Risk & return | |] | 10 ho | ur |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT | Valuat ecurities FM. | tion of Securities / Risk & return | k Valua | tion, | 10 ho Conc | ur ep |
| Annuity Factor. Module:2 Valuation of Se of Yield and YT Risk & Return | · Valuat ecurities ΓΜ. n: Defin | tion of Securities / Risk & return Bond Valuation, Preferred Stock Valuation , Common Stock | k Valua asure R | tion, isk, A | 10 ho Conc | ur ep |
| Annuity Factor. Module:2 Valuation of Se of Yield and YT Risk & Return | · Valuat ecurities ΓΜ. n: Defin | tion of Securities / Risk & return B: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea | k Valua asure R | tion, isk, A | 10 ho Conc | ur ep |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) | ecurities ΓΜ. h: Defin Risk and | tion of Securities / Risk & return Bond Valuation, Preferred Stock Valuation, Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital | k Valua asure R | tion, isk, A | 10 ho Conc Attitu g Mo | ur ep de |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 | ecurities ΓΜ. a: Defin Risk and Levera | tion of Securities / Risk & return s: Bond Valuation, Preferred Stock Valuation, Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital age / Cost of Capital | k Valua asure R Asset I | tion, isk, A | 10 ho Conc Attitu g Mo 6 ho | ur ep de |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F | · ecurities ΓΜ. h: Defin Risk and Levera | tion of Securities / Risk & return S: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L | k Valua asure R Asset I | tion, isk, A ricing | 10 ho Conc Attitu g Mo 6 ho ffere | de de de de |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve | Valuat ecurities FM. 1: Defin Risk and Levera inancial | tion of Securities / Risk & return S: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L idyCost of Capital: Concept , Computation of Specific Cost of | k Valua asure R Asset I everage | tion, isk, A ricing | 10 ho Conc Attitu g Mo 6 ho ffere | de de de ur |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve | Valuat ecurities FM. 1: Defin Risk and Levera inancial | tion of Securities / Risk & return S: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L | k Valua asure R Asset I everage | tion, isk, A ricing | 10 ho Conc Attitu g Mo 6 ho ffere | ur: ept de: de: de: de: |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De | Valuat ecurities FM. 1: Defin Risk and Levera inancial erage stu bt, Weig | tion of Securities / Risk & return s: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L adyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital | k Valua asure R Asset I everage | tion, isk, A ricing | l0 ho Conc Attitu g Mo 6 ho ffere Equi | dep dep de de de de ty |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 | Valuat ecurities TM. a: Defin Risk and Levera inancia erage stu bt, Weig Capita | tion of Securities / Risk & return Boom Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Mage / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L idyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho | de: de: de: de: de: de: de: de: de: de: |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu | Valuat ecurities FM. i: Defin Risk and Levera inancial erage stu bt, Weig Capita | tion of Securities / Risk & return s: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L adyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investment | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos | de de de de de de de de de de de de de d |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu Estimating Proje | Valuat ecurities TM. a: Defin Risk and Levera inancial erage stu bt, Weig Capita idgeting ect, Afte | tion of Securities / Risk & return Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Mage / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L idyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investmer er Tax Incremental Operating Cash Flows, Capital Budgeting | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos | de de de de de de de de de de de de de d |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu Estimating Proje | Valuat ecurities TM. a: Defin Risk and Levera inancial erage stu bt, Weig Capita idgeting ect, Afte | tion of Securities / Risk & return s: Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital age / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L adyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investment | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos | des des des de ur nce ty |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu Estimating Proje | Valuat ecurities TM. i: Defin Risk and Levera inancial erage stu bt, Weig Capita idgeting ect, Afte Selection | tion of Securities / Risk & return Bond Valuation, Preferred Stock Valuation , Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Mage / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L idyCost of Capital: Concept , Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investmer er Tax Incremental Operating Cash Flows, Capital Budgeting | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos | ur epi des de de ur als jec |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu Estimating Proj Evaluation and S | Valuat ecurities TM. i: Defin Risk and Levera inancial erage stu bt, Weig Capita idgeting ect, Afte Selection | tion of Securities / Risk & return Boom Stock Valuation, Preferred Stock Valuation, Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Dege / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L dyCost of Capital: Concept, Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investment er Tax Incremental Operating Cash Flows, Capital Budgeting n - Alternative Methods | k Valua asure R Asset I everage of Capit tal. | tion, isk, A ricing , Indi al for | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos , Proj | ur des des de ur nce ty ur als |
| Annuity Factor. Module:2 Valuation of Sec of Yield and YT Risk & Return Toward Risk, R (CAPM) Module:3 Operating & F Analysis in leve Preference – De Module:4 The Capital Bu Estimating Proj- Evaluation and S Module:5 | Valuat ecurities TM. i: Defin Risk and Levera inancial erage stu bt, Weig Capita idgeting ect, Afte Selection | tion of Securities / Risk & return Boom Stock Valuation, Preferred Stock Valuation, Common Stock ing Risk and Return, Using Probability Distributions to Mea Return in a Portfolio Context, Diversification, The Capital Dege / Cost of Capital I Leverage: Operating Leverage, Financial Leverage, Total L dyCost of Capital: Concept, Computation of Specific Cost of ghted Average Cost of Capital – Factors affecting Cost of Capital I budgeting Concept & Process - An Overview, Generating Investment er Tax Incremental Operating Cash Flows, Capital Budgeting n - Alternative Methods | k Valua asure R Asset I everage of Capit tal. nt Proje g Techn | tion, isk, A ricing , Indi al for ect Pr iques | 10 ho Conc Attitu g Mo 6 ho ffere Equi 4 ho opos , Proj 3 ho | ur ep de de de de de ty ur als jec |





| Module | e:6 Cash Management: | | | | 9 hours |
|----------|---------------------------------|--------------------|--|--------------------|-------------------|
| Motive | es for Holding cash, Speeding | Up Cash Recei | pts, Slowing | Down Cash Pay | youts, Electronic |
| Comme | erce, Outsourcing, Cash Balance | s to maintain, Fac | toring | | |
| Module | :7 Accounts Receivable 1 | Management: | | | 11 hours |
| Credit & | Collection Policies, Analyzing | the Credit Applic | ant, Credit Re | ferences, Selectin | g optimum Credit |
| period. | | | | | |
| 1 | | | | | |
| | | | Total | Lecture hours: | 45 hours |
| Text Bo | ook(s) | | | | |
| 1. Cha | andra, Prasanna - Financial | Management - | Theory & | Practice, Prent | ice Hall/Pearson |
| Edu | acation.(2019) | | | | |
| Eut | | Wilson Dublishing | House (2016) |) | |
| | . Pandey, Financial Management | . vikas Pudiisning | 110036 (2010 | | |
| | . Pandey, Financial Management | , vikas Publisning | , 110use (2010 | / | |
| 2. I.M | | <u> </u> | `````````````````````````````````````` | , | |
| 2. I.M | f Evaluation: CAT / Assignment | <u> </u> | `````````````````````````````````````` | , | |





| Course Code | Course Title | L | Т | P | J | С |
|------------------|--|--------|--------|--------|-------------|--------|
| MGT3016 | Services Science and Service Operations Management | 2 | 0 | 2 | 0 | 3 |
| Pre-requisite | NIL | | Sylla | bus | vers | ion |
| | | | V | r. 1.0 | | |
| Course Object | | | | | | |
| | examines the management of services focusing on both the strategic an | d op | eratio | onal | aspe | cts |
| 0 0 | new services | | | | | |
| 2. Helps in asse | ssing and improving service quality, improving the efficiency and eff | ectiv | reness | s of a | servi | ce |
| processes | | | | | | |
| 3. Helps in und | erstanding the integration of new technologies into service operations. | | | | | |
| E-masted Com | na Ontoomo | | | | | |
| Expected Cou | nd concepts about Services and distinguish it from Goods | | | | | |
| | characteristics and nature of Services | | | | | |
| | I ways to design Services and evaluate them using Service qualities | | | | | |
| - | | aa ha | | | | |
| | o understand various methods to be used to operate and manage Servi | ce Di | ISIIIC | sses | | |
| | nd how innovation can be approached from Services point of view | | ~~~~~ | anati | | |
| 6. To be famili | ar with the tools and techniques used for designing and managing the | servi | ce op | erati | ons. | |
| Module:1 | Introduction to services | | | | 4 ho | ur |
| Introduction to | the course, introduction to service operations, role of service in e | con | omy | and | socie | ety. |
| | Indian service sector, differences between services and operation | | - | | | - |
| | various frameworks to design service operation system, kind o | | | - | | - |
| importance of e | | | | | | |
| | | | | | | |
| Module:2 | Service Design | | | | 5 ho | urs |
| Service-Domina | ant Logic, Goods-Dominant logic to Service-Dominant logic, Value (| Co-ci | reatio | n, C | usto | mer |
| Journey and Se | rvice Design, Design Thinking methods to aid Service Design, Dev | elop | ment | of S | trate | gic |
| Service Vision | (SSV), Data Envelopment Analysis, NSD cycle, Service Blueprinting | g, Ele | ement | ts of | serv | ice |
| delivery system | | | | | | |
| | | | | | | |
| Module:3 | Quality and Yield Management | 01 | | | <u>4 ho</u> | |
| | ity locations (Huff's retail model), role of service-scape in layout desig | n, SI | | ĮUΑ | L, w | alk |
| through audit, c | limensions of service quality & other quality tools | | | | | |
| Module:4 | Service Guarantee & Service Recovery | | | | 4 ho | ur |
| | ee, benefits, types, design of service of guarantees, service failure, serv | ice r | ecove | | | |
| customer respon | | | | 57 | | 0,, |
| 1 | | | | | | |
| Module:5 | Forecasting Managing Consoity and facilities | | | | 4 ho | 11.144 |
| | Forecasting, Managing Capacity and facilities mand for Services, review of different types of forecasting methods, m | nana | oina | | | |
| - | gies for matching capacity and demand, psychology of waiting, applic | | | - | - | |
| | ng waiting line in services, managing facilitating Goods, review of inve | | | | | |
| inventory in ser | | CIIIOI | y me | uuts, | , 1010 | / UI |
| myentory in ser | VICES | | | | | |



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CURRICULUM (2022 - 2023)

| Module:6 | Service Supply, Queuing Models | | | 4 hours |
|--------------|--|-------------------|-----------------------|----------------|
| Managing s | ervice supply relationship: Understanding | the supply cha | ain/hub of service, | Strategies for |
| | ppliers of service, Vehicle Routing Proble involve transportation of people and vehicle | | | |
| services tha | involve transportation of people and vehicle | e, rechniques to | or optimizing venic | le routes |
| Module:7 | Service Innovation | | | 3 hours |
| Services Pro | luctivity, Need for Services Innovation, Case | e studies, | | |
| | | | | |
| Module:8 | Contemporary Issues | | | 2 hours |
| Guest lectu | re by Industry Experts or R&D organization | | | |
| | | Total le | ecture hours | 30 hours |
| | | | | |
| Text Book | 0 Ettering of Commission Management | | 1 | |
| | nons & Fitzsimmons, Service Management dedition, McGraw Hill publications. | t: Operations, S | strategy, informatio | n Technology, |
| Reference 1 | | | | |
| | A., Zeithaml, V. A., Bitner, M. J., &Gremle | er. D. D. Service | es marketing: Integr | ating customer |
| | ross the firm. 2012. McGraw Hill publication | | | |
| | Ben, and Lovlie, Lavrans, Service Design f | | Practical Guide to | Optimizing the |
| | er Experience, 2016, Pan Macmillan India. | | | |
| | | | | |
| | aluation: CAT / Assignment / Quiz / FA | AT / Project / S | Seminar | |
| List of Exp | | | | |
| - | n new super market in a cosmopolitan city (I | • • | | |
| levels, e | xperimental design, presentation of alternativ | ves to responden | ts and estimation of | f choice |
| model) | | | | |
| 2. Choose | any service organization and present it from | the perspective | of nature of service, | classification |
| of servi | e, blueprint or service design analysis, and se | rvice quality. | | |
| 3. Prepare | a service blueprint for a fast food outlet. | | | |
| 4. Using d | ta, software, user and mashup as services pro- | epare a next ger | service oriented are | chitecture. |
| | a review article after analysing 5 relevant par | | | |
| and fee | back on the same. | - | | - |
| 6. Analyse | a fortune 500 company in digital media and | point out how t | hese technologies co | ould be |
| - | ly used in a startup in digital space. | 1 | 0 | |
| | the booking policy of an international flight | operator, assum | ning that the average | e number of no |
| - | 10%, explain why the best overbooking nece | - | | |
| | a comparative chart analysing any four food | | | sed on |
| - | y, responsiveness, assurance, and empathy. | activery agener | to and rank them ba | |
| | | | Total Hou | irs 30Hours |
| Mode of Fi | aluation: Assessments/Midterm Lab/ FA | АТ | | IIS JULIUUIS |
| | auanon, Assessments/ Muterin Lau/ TE | | | |
| | led by Board of Studies 22-05-2021 | | | |



B. Tech Computer Science and Engineering and Business Systems

PROGRAMME ELECTIVE (AY 2022 - 2023)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)



| Sl.No. | Course Code | Course Title | Page No. |
|--------|-------------|---|----------|
| 1. | CBS1011 | Programming in Python | 65 |
| 2. | CSE1007 | JAVA Programming | 67 |
| 3. | CBS3005 | Cloud, Microservices and Applications | 70 |
| 4. | CBS3006 | Machine Learning | 72 |
| 5. | CBS3007 | Data Mining and Analytics | 74 |
| 6. | CBS3008 | Introduction to Internet of Things | 77 |
| 7. | CBS3009 | Advanced Social, Text and Media Analytics | 79 |
| 8. | CBS3010 | Mobile Computing | 81 |
| 9. | CBS3013 | Conversational Systems | 83 |
| 10. | CBS3014 | Modern Web Applications | 85 |
| 11. | CBS3015 | Information Systems Audit and Control | 87 |
| 12. | CBS3016 | Cognitive Science and Analytics | 89 |
| 13. | CBS4001 | Robotics and Embedded Systems | 92 |
| 14. | CBS4002 | Cryptology and Analysis | 94 |
| 15. | CBS4003 | Quantum Computation and Quantum | 96 |
| | | Information | |
| 16. | CBS4004 | Image Processing and Pattern Recognition | 98 |
| 17. | CBS4005 | Enterprise Systems | 100 |



| Course code | | L | Τ | Р | J | С |
|--|--|-----------------------|--------------------------------|---------------------------------------|---|--------------------|
| CBS1011 | Programming in Python | 2 | 0 | 2 | 0 | 3 |
| Pre-requisit | e NIL | Sy | yllab | us v | | |
| | | | | | v. | 1.0 |
| Course Object | | | | | | |
| - | vide exposure to basic problem-solving techniques with computers | | | | | |
| | elop the logical thinking abilities and to propose novel solutions for | rea | l wo | rld | | |
| - | ms through programming language constructs. | | | | | |
| 3. To dee | pen the empirical knowledge on applying programming on business | s do | mair | ıs. | | |
| Exposted Con | nco Outoomou | | | | | |
| Expected Cou 1. Interpre | t the basic representation of the data structures and sequential program | rom | mina | ۲ | | |
| - | dge of, and ability to use control framework terminologies. | am | 1111112 | 5 | | |
| | to work out using the core data structures as lists, dictionaries, tuples | | d so | ta | | |
| • | • | | | | n | 60 |
| | appropriate programming paradigms, interrupt and handle data usin through reusable modules. | ig n | lles | o pi | opo | se |
| | possible error-handling constructs for unanticipated states/inputs | | | | | |
| - | ent exemplary applications on the real-world problems. | | | | | |
| I I | | | | | | |
| | | | | | | |
| Module:1 In | troduction to Python Programming | | | 4 | 4 ho | ur |
| | | vtho | n – | | | |
| Introduction to | troduction to Python Programming | | | Va | riab | les |
| Introduction to Keywords, Cor | troduction to Python Programming Python, Demo of Interactive and script mode, Tokens in Py | | | Va | riab | les |
| Introduction to Keywords, Cor Input and Print | troduction to Python Programming 9 Python, Demo of Interactive and script mode, Tokens in Py 9 nments, Literals, Data types, Indentation, Operators and its preced 9 functions. Sequential approach | | | Va xpre | riab essic | les ons |
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VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | odule:6 | File Handling | | | | 3 hours |
|--|--|--|---|---|--|----------------|
| File | es: Open, | Read, Write, Append and | Close. Tell and | seek metho | ods | |
| | | | | | | |
| Mo | odule:7 | Handling Exceptions | | | | 3 hours |
| Err | ors and I | Exceptions: Syntax Errors | , Exceptions, Har | ndling Exce | eptions, Raising Excep | otions, |
| Exc | ception C | Chaining, User-defined Exe | ceptions, Definin | g Clean-Uj | p actions. | |
| Mo | odule:8 | Contemporary issues: | | | | 2 hours |
| Gu | est lectur | e by Industry experts or F | R&D organization | 1 | | |
| | | | | Tota | l Lecture hours: | 30 hour |
| Te | xt Book | (s) | | | | |
| 1. | Eric N | Iatthes, Python Crash Co | urse: A Hands-O | n, Project- | Based Introduction to | |
| | Progra | amming, 2nd Edition, No | starch Press, 201 | 9. | | |
| Re | ference | Books | | | | |
| | | | | | | |
| 1. | Martic | C Brown, Python: The Co | omplete Referenc | e, 4th Editi | ion, McGraw Hill Pub | lishers, |
| 1. | Martic 2018. | C Brown, Python: The Co | omplete Referenc | e, 4th Editi | ion, McGraw Hill Pub | lishers, |
| 1. 2. | 2018. | C Brown, Python: The Cost Solution Solution | | | | |
| 2. | 2018. Charles Solving | s Dierbach, Introduction g Focus,2 nd Edition, Wiley | to Computer Sci India Edition, 20 | ience using)17. | g Python: A Computat | |
| 2. | 2018. Charles Solving | s Dierbach, Introduction | to Computer Sci India Edition, 20 | ience using)17. | g Python: A Computat | |
| 2. | 2018. Charles Solving | s Dierbach, Introduction g Focus,2 nd Edition, Wiley | to Computer Sci India Edition, 20 | ience using)17. | g Python: A Computat | |
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| 2. M o | 2018. Charles Solving ode of E | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig Illenging Experiments (I tial programs with python | to Computer Sci India Edition, 20 ment / Quiz / Indicative) | ience using)17. FAT / Pro | g Python: A Computat D ject / Seminar | |
| 2. Mo | 2018. Charles Solving ode of E st of Cha Sequen Selection | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig illenging Experiments (I tial programs with python onal and Looping construct | to Computer Sci India Edition, 20 ment / Quiz / Indicative) | ience using)17. FAT / Pro | g Python: A Computat D ject / Seminar | |
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| 2. Mo Lis 1. 2. 3. 4. | 2018. Charles Solving ode of E st of Cha Sequen Selection List,Tu String I | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig illenging Experiments (I tial programs with python onal and Looping construc- ples, Dictionary and Sets Manipulation and Regular | to Computer Sci India Edition, 20 ment / Quiz / Indicative) tokens, operator cts Expression | ience using)17. FAT / Pro | g Python: A Computat D ject / Seminar | |
| 2. M (Lis 1. 2. 3. 4. 5. | 2018. Charles Solving ode of E st of Cha Sequen Selection List,Tu String I Function Files | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig illenging Experiments (I tial programs with python onal and Looping construc- ples, Dictionary and Sets Manipulation and Regular | to Computer Sci India Edition, 20 ment / Quiz / Indicative) tokens, operator cts Expression | ience using)17. FAT / Pro | g Python: A Computat D ject / Seminar | |
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| 2. M (Lis 1. 2. 3. 4. 5. 6. 7. | 2018. Charles Solving ode of E st of Cha Sequen Selection List,Tu String I Function Files Exception | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig illenging Experiments (1 tial programs with python onal and Looping construc- ples, Dictionary and Sets Manipulation and Regular ons, Recursion and Lamda | to Computer Sci India Edition, 20 ment / Quiz / Indicative) tokens, operator ts Expression functions | Total Lab | g Python: A Computat oject / Seminar essions | tional Problem |
| 2. M Lis 1. 2. 3. 4. 5. 6. 7. M R M | 2018. Charles Solving ode of E st of Cha Sequen Selection List,Tu String I Function Files Exception | s Dierbach, Introduction g Focus,2 nd Edition, Wiley valuation: CAT / Assig illenging Experiments (I tial programs with python onal and Looping construc- ples, Dictionary and Sets Manipulation and Regular ons, Recursion and Lamda | to Computer Sci India Edition, 20 ment / Quiz / Indicative) tokens, operator ts Expression functions | Total Lab | g Python: A Computat oject / Seminar essions | |



VIT[®] Vellore Institute of Technology

CURRICULUM (2022 - 2023) B. Tech Computer Science and Engineering and Business Systems

CSE1007 JAVA PROGRAMMING P J L Т С 3 0 2 0 4 **Pre-requisite** NIL Syllabus version v1.0 **Course Objectives:** To impart the core language features of Java and its Application Programming Interfaces(API) 1. To demonstrate the use of threads, exceptions, files and collection frameworks in Java. 2. To familiarize students with GUI based application development and database 3. connectivity. **Expected Course Outcome:** Comprehend Java Virtual Machine architecture and Java Programming Fundamentals. 1. 2. Design applications involving Object Oriented Programming concepts such as inheritance, association, aggregation, composition, polymorphism, abstract classes and interfaces. 3. Design and build multi-threaded Java Applications. 4. Build software using concepts such as files, collection frameworks and containers. 5. Design and implement Java Applications for real world problems involving DatabaseConnectivity 6. Design Graphical User Interface using JavaFX. 7. Design, Develop and Deploy dynamic web applications using Servlets and Java ServerPages. Java Fundamentals Module:1 4 hours Java Basics: Java Design goal - Features of Java Language - JVM - Bytecode - Java source filestructurebasic programming constructs- Arrays- one dimensional and multi-dimensional enhanced for loop String package 5 hours Module:2 | Object Oriented Programming Class Fundamentals - Object reference array of objects constructors methods over- loading this reference static block - nested class inner class garbage collection finalize() Wrapper classes Inheritance types - use of super - Polymorphism abstract class interfaces packages and sub packages. Module:3 **Robustness and Concurrency** 6 hours Exception Handling - Exceptions Errors - Types of Exception - Control Flow in Exceptions - Use of try, catch, finally, throw, throws in Exception Handling - user defined exceptions -Multithreading Thread creation sharing the workload among threads synchronization inter thread communication deadlock. Module:4 Files, Streams and Object serialization 7 hours Data structures: Java I/O streams Working with files Serialization and deserialization of objects Lambda expressions, Collection framework List, Map, Set, Generics Annotations Module:5 **GUI Programming and Database** 7 hours **Connectivity**





B. Tech Computer Science and Engineering and Business Systems

GUI programming using JavaFX, exploring events, controls and JavaFX menus Accessing databases using JDBC connectivity.

Module:6 Servlets

Introduction to servlet - Servlet life cycle - Developing and Deploying Servlets - Exploring Deployment Descriptor (web.xml) - Handling Request and Response - Session Tracking Management.

Module:7 Java Server Pages

JSP Tags and Expressions - JSP Expression Language (EL) - Using Custom Tag - JSP with Java Bean.

Module:8 | Contemporary Issues

Guest lecture by Industry Experts or R&D organization

Total Lecture hours: 45 hours

7 hours

7 hours

2 hours

Text Book(s)

- 1. Herbert Schildt, The Complete Reference -Java, Tata McGraw-Hill Education, Tenth Edition, 2017.
- 2. Paul J. Deitel, Harvey Deitel, Java SE8 for Programmers (Deitel Developer Series) 3rd Edition, 2014
- 3. Y. Daniel Liang, Introduction to Java programming-comprehensive version-Tenth Edition, Pearson ltd 2015

Reference Books

- 1. Paul Deitel Harvey Deitel, Java, How to Program, Prentice Hall; 9th edition, 2011.
- 2. Cay Horstmann BIG JAVA, 4th edition, John Wiley Sons,2009
- 3. Nicholas S. Williams, Professional Java for Web Applications, Wrox Press, 2014.

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

List of Challenging Experiments (Indicative)

1. Write a program to demonstrate the use of multidimensional arrays and looping constructs.

- 2. Write a program to demonstrate the application of String handling functions.
- 3. Write a program to demonstrate the use of Inheritance.
- 4. Write a program to demonstrate the application of user-defined packages and sub-packages.
- 5. Write a program to demonstrate the use of Java Exception handling methods.
- 6. Write a program to demonstrate the use of threads in Java.
- 7. Demonstrate with a program the use of File handling methods in Java.
- 8. Demonstrate the use of Java collection frameworks in reducing application development time.
- 9. Build a GUI application using JavaFX
- 10. Write a program to register students data using JDBC with MySQL Database.
- 11. Write a program that uses Servlets to perform basic banking tasks.
- 12. Write a web application using JSP and demonstrate the use of http request and response methods.





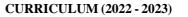
| 13. | Write a JSP program for an order r | nanagement syste | m. | | |
|------|--|-------------------------------|----------------|--------------------|-----------|
| 14. | Write a JSP program that using JD | BC and MySQL d | latabase to st | ore the user data. | |
| 15. | JSP with Java Bean | | | | |
| | | | Total La | boratory Hours | 30 hours |
| | | | I otul Eu | solutory mours | 50 110015 |
| Mode | e of Assessment: Assessments/ N | fid Term Lab/ F | | | 50 110013 |
| | e of Assessment: Assessments/ N mmended by Board of Studies | 1id Term Lab/ F 10-08-2018 | | | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | Course Title | L | Т | P | J | С |
|--|---|-------|-------|-------|---|--------------------------------------|
| CBS3005 | Cloud Microservices and Applications | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | | Syl | labu | | rsior |
| | | | | v. 1. | 0 | |
| Course Objectives: | | | | | | |
| | damentals of cloud computing | | | | | |
| 1 0 | orking knowledge of the essentials of Cloud Micro Services | | | | | |
| 3. To implement busir | ness specific cloud applications | | | | | |
| Expected Course Or | itcome: | | | | | |
| 1. Study the basics of | cloud computing, cloud models and its applications. | | | | | |
| 2. Understand cloud se | ervices and architecture. | | | | | |
| 3. Learn how to use C | loud Services and to build applications. | | | | | |
| 4. Realize security nee | ds for cloud service and Analyze different SLAs | | | | | |
| 5. Analyze platform-sp | pecific security features and management of security controls. | | | | | |
| 6. Design, Develop & | Deploy real-world applications in the cloud computing platfor | rms | | | | |
| Module:1 Clou | d Fundamentals | | 1 | | 4 H | |
| | nents - Deployment Models – Application of Cloud Computin | a | | | 4 H | our |
| cioud Service Compo | nents - Deployment Wodels - Application of Cloud Computin | B | | | | |
| Module:2 Appl | ication Architectures | | | | 6 H | our |
| | | | | | | |
| Monolithic and Distri | buted – Micro Service fundamentals – Design Approach – Clo | oud l | Nativ | ve Ap | plic | atio |
| | buted – Micro Service fundamentals – Design Approach – Clo ion Process – API fundamental – API Management | oud I | Nativ | ve Ap | plic | atio |
| Application Integrat | ion Process – API fundamental – API Management | oud] | Nativ | ve Ap | | |
| Application Integrat Module:3 Clou | ion Process – API fundamental – API Management d Services | | | | 8 H | ours |
| Application Integrat Module:3 Clou | ion Process – API fundamental – API Management | | | | 8 H | ours |
| Application Integrat Module:3 Clou Application Services - | ion Process – API fundamental – API Management d Services | | | | 8 H | our: re |
| Application Integrat Module:3 Clou Application Services - | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Servic d Application Development | | | | 8 H Azu | ours re |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases | | | | 8 H Azu 8 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security | | | | 8 H Azu 8 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security | | | | 8 H Azu 8 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management | | | | 8 H Azu 8 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management | | | | 8 H Azu 8 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management | | | | 8 H Azu 8 H 6 H | ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Module:7 Case | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools | | | | 8 H Azu 8 H 6 H | our: our: our: |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Module:7 Case Azure features use cas | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools Studies es - GCP Features Use cases - AWS features use cases | | | | 8 H Azu 8 H 6 H 5 H | ours ours ours ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Module:7 Case Azure features use cas Module:8 Cont | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools Studies es - GCP Features Use cases - AWS features use cases emporary Issues | | | | 8 H Azu 8 H 6 H | ours ours ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Module:7 Case Azure features use cas Module:8 Cont | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools Studies es - GCP Features Use cases - AWS features use cases | | | | 8 H Azu 8 H 6 H 5 H 6 h | ours ours ours ours |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Cloud Security Moni Module:7 Case Azure features use cas Module:8 Cont Guest lecture by Indu Text Book(s) | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools Studies es - GCP Features Use cases - AWS features use cases stry Experts or R&D organization Total Lecture hor | ces - | Win | dows | 8 H Azu 8 H 6 H 5 H 6 h 2 H | our: our: our: our: our: |
| Application Integrat Module:3 Clou Application Services - Module:4 Clou Python-Refresher, Us Module:5 Clou Security Basics and B Module:6 Clou Cloud Security Moni Cloud Security Moni Module:7 Case Azure features use cas Module:8 Cont Guest lecture by Indu Text Book(s) | ion Process – API fundamental – API Management d Services Deployment and Management Services - Amazon Web Service d Application Development e cases d Security enefits – Challenges d Service Monitoring and Management toring Tools Studies es - GCP Features Use cases - AWS features use cases emporary Issues stry Experts or R&D organization | ces - | Win | dows | 8 H Azu 8 H 6 H 5 H 6 h 2 H | our: our: our: our: our: |





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B. Tech Computer Science and Engineering and Business Systems

2. Ronald Krutz and Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley, 2010.

Reference Books

- 1. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, McGraw Hill, 2010.
- 2. Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Helper, Cloud Computing For Dummies, Wiley, 2010.

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

List of Challenging Experiments (Indicative)

- 1. Develop cloud application using Amazon Cloud, Google Cloud.
- 2. Demonstrate cloud application using Windows Azure.
- 3. Implementation of Amazon cloud services.
- 4. Patient Health Monitoring using AWS/Windows Azure.
- 5. Financial Trading Monitoring System using AWS/Windows Azure.
- 6. Cloud Usecase resource monitoring using AWS/Windows Azure.

| |] | Fotal Labo | ratory Hours: | 30 hours |
|------------------------------------|----------------|-------------------|---------------|----------|
| Mode of Assessment: Assessments/Mi | d Term Lab/ FA | T / Projec | t | |
| Recommended by Board of Studies | 29-01-2021 | | | |
| Approved by Academic Council | No. 61 | Date | 18-02-2021 | |



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CURRICULUM (2022 - 2023)

| Course Code | Course Title L | T | P | J | C |
|--------------------------|--|--------|------------|-------|---------|
| CBS3006 | Machine Learning 2 | 0 | 2 | 4 | 4 |
| Pre-requisite | NIL | S | yllat | ous v | ersion |
| Course Objectives: | | | | | v. 1.0 |
| 0 | end the concept of supervised and unsupervised learning technique | ues | | | |
| | sion, classification and clustering techniques and to implement th | | gorit | hms | |
| | formance of various machine learning techniques and to select | | - | | |
| for training machine | 0 1 | F F - | - r | | |
| 6 | | | | | |
| Expected Course O | itcome: | | | | |
| | cepts of various machine learning strategies. | | | | |
| = | hal data and learn ANN learning models. | | | | |
| | plications by selecting suitable learning model. | | | | |
| - | nce of the model by combining results from different approaches | s. | | | |
| - | sify sequencing patterns using HMM. | | | | |
| | and relationship between the data objects. | _ | | | |
| 7. Construct machine | learning model for unseen data and can solve real world applicat | ion. | | | |
| Module:1 Intro | oduction to Machine Learning | | | 2 | hour |
| | nine Learning (ML); Feature engineering; Learning Paradigr | n G | ener | | |
| | ision, PAC learning, Applications of ML. | n, O | | ιπza | |
| | ision, The featuring, Applications of ML. | | | | |
| Module:2 Data | Handling and ANN | | | 4 | hours |
| Feature selection Me | chanisms, Imbalanced data, Outlier detection- Artificial neura | l netv | work | s inc | luding |
| backpropagation- App | lications | | | | - |
| | | | | | |
| | Models and Evaluation | | | | hours |
| - | iable regression; Model evaluation; Least squares regression; Re | - | | | |
| | ssion, Classification – KNN, Naïve Bayes, SVM, Decision Trees | | U | | |
| | oss-validation; Model evaluation (precision, recall, F1-mesure, | | acy, | area | under |
| Jurve), Statistical deci | sion theory including discriminant functions and decision surface | :5 | | | |
| Module:4 Mod | el Assessment and Inference | | | 4 | hours |
| | nd Selection – Ensemble Learning – Boosting, Bagging, M | /lode | Inf | | |
| | Theory, EM Algorithm | | | | |
| | | | | | |
| | | | | | |
| | len Markov Models | | | | hours |
| Hidden Markov Mod | els (HMM) with forward-backward and Vierbi algorithms; Se | - | | assif | ication |
| Hidden Markov Mod | | - | | assif | ication |



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CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Mining Association Rules in Large Databases. Mining Frequent Patterns-- basic concepts - Efficient and scalable frequent item set mining -methods, Apriori algorithm, FP-Growth algorithm

Module:7 Clustering

K Means, Hierarchical Clustering – Single, complete, Average linkage; Ward's algorithm; Minimum spanning tree clustering; BIRCH clustering

Module:8 Contemporary Issues

Guest lecture by Industry Experts or R&D organization

Total Lecture hours:

2 hours 30 hours

5 hours

Text Book(s)

- 1. Ethem Alpaydin, Introduction to Machine Learning, MIT Press, Pearson, Third Edition, 2014.
- 2. Friedman Jerome, Trevor Hastie, and Robert Tibshirani. The Elements of Statistical Learning. Springer-Verlag, 2nd Edition, 2013.

Reference Books

- 1. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012.
- 2. Peter Flach, "Machine Learning: The Art and Science of Algorithms that Make Sense of Data", Cambridge University Press, 2012.

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

List of Challenging Experiments (Indicative)

| LISU | n Chanenging Experiments (mulca | iuve) | | | | | | |
|------|--|-------------------|--------------|-------------------------------|--|--|--|--|
| 1. | Implement Decision Tree learning | | | | | | | |
| 2. | Implement Logistic Regression | | | | | | | |
| 3. | Implement classification using Multi | layer perceptron | | | | | | |
| 4. | Implement classification using SVM | | | | | | | |
| 5. | Implement Adaboost | | | | | | | |
| 6. | Implement Bagging using Random F | Forests | | | | | | |
| 7. | Implement K-means Clustering to F | Find Natural Patt | erns in Data | | | | | |
| 8. | Implement Hierarchical clustering | | | | | | | |
| 9. | Implement K-mode clustering | | | | | | | |
| 10 | Implement Association Rule Mining | using FP Growt | h | | | | | |
| 11. | Classification based on association ru | ules | | | | | | |
| 12. | Implement Gaussian Mixture Model | Using the Exect | ation Maxin | nization | | | | |
| 13 | Evaluating ML algorithm with balan | ced and unbalance | ced datasets | | | | | |
| 14 | Comparison of Machine Learning al | gorithms | | | | | | |
| 15 | Implement k-nearest neighbour algo- | orithm | | | | | | |
| | | | Tot | al Laboratory Hours: 30 hours | | | | |
| Mode | e of Assessment: Assessments/ Mic | d Term Lab/ FA | AT / Projec | et | | | | |
| Reco | mmended by Board of Studies | 29-01-2021 | | | | | | |
| Appr | oved by Academic Council | No. 61 | Date | 18-02-2021 | | | | |



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| Course Code | | Course Title | L | T | P | Ĵ | C |
|-----------------------|--------------|--|----------|----------|-------------|--------------|--|
| CBS3007 | | Data Mining and Analytics | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | | NIL | | Syllab | | | 1 |
| Course Objectiv | VOC. | | | | v. 1.0 | | |
| | | ental processes data warehousing and major issues in da | ata m | ining | | | |
| | | ge on various data mining concepts and techniques the | | • | nnlie | d to | tex |
| mining, web mir | - | se on various data mining concepts and techniques an | ut cu | 11 00 0 | ppin | <i>u</i> 10 | ion' |
| - | - | ge for application of data mining and social impacts of d | lata n | nining | | | |
| 5. To develop the | e kilo wiedz | se for approaction of data mining and social impacts of a | atu II | | • | | |
| Expected Cours | se Outcon | ne: | | | | | |
| 1. Interpret the co | ontribution | n of data mining to the decision-support systems. | | | | | |
| 2. Prepare the | data need | ed for data mining using preprocessing techniques | and | apply | y the | vari | ou |
| visualization tec | hniques. | | | | | | |
| 3. Discover intere | esting patte | erns from large amounts of data using Association Rule | Mini | ng | | | |
| 4. Extract useful | informatio | n from the labeled data using various classifiers and Pre | edicto | ors | | | |
| 5. Compute forec | casts for a | variety of linear methods and models | | | | | |
| 6. Demonstrate o | capacity to | perform a self-directed piece of practical work that re | quire | es the | appli | catio | n o |
| data mining tech | nniques. | | | | | | |
| | | | | | | | |
| Module:1 | | luction to Data Mining | | | | 3 ho | |
| - | | Related technologies - Machine Learning, DBMS, OL | | | | - | s of |
| the Data Mining | Process, D | Data Mining Techniques, Knowledge Representation Me | thods | s, App | olicati | ons | |
| Module:2 | Data | preprocessing | | | | 5 ho | 1111 |
| | | formation, Data reduction, Discretization and generat | ing (| roncei | l ot hie | | |
| 0 | | ning System, Experiments with Weka - filters, discretization | 0 | once | je me | l'aren | nes |
| | 5 Dutu Mili | | 1011 | | | | |
| Module:3 | Data 1 | mining knowledge representation | | | | 4 ho | ur |
| Task relevant da | | ound knowledge, Representing input data and output k | now | ledge, | Visu | | |
| techniques; Attril | bute-orient | ed analysis: Attribute generalization, Attribute relevance | e, Cla | lss cor | npari | son, | |
| Statistical measu | ures | | | | | | |
| | | | | | | | |
| Module:4 | | mining algorithms - Association rules | | | | 4 ho | |
| | ••• | y, Example: mining weather data, Basic idea: item sets, | - | - | | | |
| . | | and scalable frequent item set mining methods: Aprior | ri alg | orithr | n, FF | P-Gro | wtł |
| algorithm, Correl | lation analy | ysis | | | | | |
| Module:5 | Data 1 | mining algorithms – Classification & Prediction | | | 1 | 5 ho | r |
| | | s, inferring rudimentary rules: 1R, algorithm, Decisio | on tre | es c | l overi | | |
| 0 | U | ask, Statistical (Bayesian) classification, Bayesian netwo | | | | 0 | |
| methods (nearest | | | - 110, 1 | instan | <i>0</i> a | .5 ~u | |
| incursus (nourost | | , | | | | | |
| Module:6 F | Forecastin | g models | | <u> </u> | | 11 ho |)]]r |
| | | 6 6 | | | | | · · ·································· |



VIT® Vellore Institute of Technology

CURRICULUM (2022 - 2023) B. Tech Computer Science and Engineering and Business Systems

Descriptive analytics: Data Modeling, Trend Analysis, Simple Linear Regression Analysis Forecasting models: Heuristic methods, predictive modeling and pattern discovery, Logistic Regression: Logit transform, ML estimation, Tests of hypotheses, Wald test, LR test, score test, test for overall regression, multiple logistic regression, forward, backward method, interpretation of parameters, relation with categorical data analysis. Interpreting Regression Models, Implementing Predictive Models. Generalized Linear model: link functions such as Poisson, binomial, inverse binomial, inverse Gaussian, Gamma. Module:7 **Time Series Analysis** 11 hours Time Series Analysis: Auto - Covariance, Auto-correlation and their properties. Exploratory time series analysis, Test for trend and seasonality, Exponential and moving average smoothing, Holt – Winter smoothing, forecasting based on smoothing Linear time series models: Autoregressive, Moving Average, Autoregressive Moving Average and Autoregressive Integrated Moving Average models; Estimation of ARMA models such as Yule-Walker estimation for AR Processes, Maximum likelihood and least squares estimation for ARMA Processes, Forecasting using ARIMA models Prescriptive Analytics: Mathematical optimization, Networks modeling-Multi-objective optimization-Stochastic modeling, Decision and Risk analysis, Decision trees. **Contemporary Issues** Module:8 2 hours Guest lecture by Industry Experts or R&D organization 45 hours **Total Lecture hours:** Text Book(s) Ian H. Witten, Eibe Frank, and Mark A. Hall, Christopher Pal, "Data Mining: Practical Machine 1. Learning Tools and Techniques" Morgan Kaufmann Publishers, 4th Edition, 2017 George E. P. Box, Gwilym M. Jenkins, Gregory C. Reinsel, Greta M. Ljung. "Time Series Analysis, 2. Forecasting and Control", John Wiley, 5th Edition, 2015 **Reference Books** Jiawei Han and Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann 1. Publishers, 3rd Edition 2012. A. Colin Cameron and Pravin K. Trivedi, "Regression Analysis of Count Data", Cambridge 2. University Press, 2nd Edition, 2013 Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar List of Challenging Experiments (Indicative) Create a Weather Table with the help of WEKA tool 1. Apply Pre-Processing techniques to the training data set of Weather Table 2. Normalize Weather Table data using Knowledge Flow 3. Implement A-priori algorithm 4. Implement FP Growth algorithm 5. Implement Decision Tree learning. 6. Implement Logistic Regression. 7. Implement classification using Multilayer perceptron. 8. Implement Bagging using Random Forests 9. 10. Implement Bayesian networks





| 11. | Implement k-nearest neighbors algo | orithm | | | | | | |
|-----|--|------------------|----------------|---------------------|-------------------|--|--|--|
| 12. | 12. Build statistical models using any linear regression technique | | | | | | | |
| 13. | Build statistical models using Nonli | inear regression | technique | | | | | |
| 14. | Build statistical models using Logis | tic regression | | | | | | |
| 15. | Perform forecast analysis using AR | IMA model | | | | | | |
| | | | Tot | al Laboratory Hours | 5 30 hours | | | |
| Mod | le of Assessment: Assessments/ M | /lid Term Lab/ | / FAT / Projec | t | | | | |
| | Recommended by Board of Studies 29-01-2021 | | | | | | | |
| App | roved by Academic Council | No. 61 | Date | 18.02.2021 | | | | |



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CURRICULUM (2022 - 2023)

| Course C | | Course Title | L | Τ | Р | J | С |
|---|--|---|-------|--|---------------------------------|--|--|
| CBS30 | | Introduction to Internet of Things | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | | NIL | | Sy | llabu | | rsion |
| | 4. | | | | v.1. | 0 | |
| Course Objec | | minsiples and appoints of Internet of Things use access and | Last | | | | |
| | | principles and concepts of Internet-of-Things use cases, app | ncat | ions | , arch | intect | ure |
| and techno | U | | 1 | 1. | <i>.</i> . | <i>.</i> | |
| 2. To get an o | overview of | of an end to end IoT system encompassing the edge, cloud ar | na ar | opiic | ation | tiers | |
| Expected Cou | irse Out | come: | | | | | |
| A | | nciples and concepts of Internet-of-Things use cases, applica | ation | s. | | | |
| | - | ncepts of Architecture of IoT. | | | | | |
| | | Industrial systems. | | | | | |
| | | king and communication for IoT. | | | | | |
| | | ta processing and storage. | | | | | |
| - | | plications in various domains using prototype models. | | | | | |
| | | | | | | | |
| Module:1 | | luction to IoT and Use cases | | | | | ours |
| | | ncepts of IoT, Consumer IoT vs Industrial Internet, Fundan | nent | al bi | uildir | ıg bl | ocks, |
| Use Cases of I | oT in var | ious industry domains. | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | tecture | | | | | |
| IoT reference | architectu | ares, Industrial Internet Reference Architecture, Edge Com | puti | ng, I | IoT C | | |
| IoT reference | architectu | | puti | ng, I | IoT C | | |
| IoT reference Data Ingestion | architectu and Data | ares, Industrial Internet Reference Architecture, Edge Com Processing Pipelines, Data Stream Processing. | iputi | ng, I | IoT C | Gatev | ways, |
| IoT reference Data Ingestion Module:3 | architectu and Data | ures, Industrial Internet Reference Architecture, Edge Com Processing Pipelines, Data Stream Processing. rs | | | IoT C | Gatev | ways, |
| IoT reference Data Ingestion Module:3 | architectu and Data | ares, Industrial Internet Reference Architecture, Edge Com Processing Pipelines, Data Stream Processing. | | | IoT C | Gatev | ways, |
| IoT reference Data Ingestion Module:3 Introduction to | architectu and Data Senso sensors | ures, Industrial Internet Reference Architecture, Edge Com Processing Pipelines, Data Stream Processing. rs | | | IoT C | Gatev 6 h | ways, |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 | architectu and Data Senso sensors | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa | ards. | | | Gatev 6 h | vays, |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to | architectu and Data Senso sensors Industria | ures, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems l data acquisition systems, industrial control systems and the | ards. | | | Gatev 6 h 6 h | ways, |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 | architectu and Data Senso sensors Industria Netwo | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems 1 data acquisition systems, industrial control systems and the orking and Communication for IoT | ards. | ncti | ons. | Gatev 6 h 6 h | ours |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI | architectu and Data Senso sensors Industria Netwo 7 layer ar | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the prking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to | ards. | ncti | ons. | Gatev 6 h 6 h | ways, |
| Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI | architectu and Data Senso sensors Industria Netwo 7 layer ar | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems 1 data acquisition systems, industrial control systems and the orking and Communication for IoT | ards. | ncti | ons. | Gatev 6 h 6 h | ours |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (2 | architectu and Data Senso sensors Industria Netwo 7 layer an ZigBee, B | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) | ards. | ncti | ons. | G h | ours ours ours rking |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (7 Module:6 | architectu and Data Senso sensors Industria Netwo ZigBee, B | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols | ards. | nctio | ons. ity ne | Gatew 6 h 7 h etwo 8 h | ours nours nours rking |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (2 Module:6 Industrial netw | architectu and Data Senso sensors Industria Industria Netwo 7 layer an ZigBee, B Netwo | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols pocols (Modbus, CANbus), Communicating with cloud applic | ards. | nctional state of the state o | ons. ity ne | G h G h 7 h Etwo 8 h Servic | ours ours rking |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (7 Module:6 Industrial netw REST, TCP/II | architectu and Data Senso sensors Industria Netwo 7 layer an ZigBee, B Netwo vork proto P and UD | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols | ards. | nctional state of the state o | ons. ity ne | Gatev Gh Gh 7 h Etwo 8 h Servio | ours ours rking |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (2 Module:6 Industrial netw | architectu and Data Senso sensors Industria Netwo 7 layer an ZigBee, B Netwo vork proto P and UD | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols pocols (Modbus, CANbus), Communicating with cloud applic | ards. | nctional state of the state o | ons. ity ne | Gatev Gh Gh 7 h Etwo 8 h Servio | ours ours rking |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (7 Module:6 Industrial netw REST, TCP/II Protocol Buff | architectu and Data Senso sensors Industria Industria Netwo 7 layer an ZigBee, B Netwo vork proto P and UD ers). | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems and transducers, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols pocols (Modbus, CANbus), Communicating with cloud applic | ards. | nctional state of the state o | ons. ity ne | Gatew 6 h 6 h 7 h etwo 8 h servio | ours ours rking ours ces, |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (7 Module:6 Industrial netw REST, TCP/II Protocol Buffe Module:7 | architectu and Data Senso sensors Industria Industria Netwo 7 layer an ZigBee, B Netwo vork proto P and UE ers). | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems l data acquisition systems, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols pcols (Modbus, CANbus), Communicating with cloud applic DP/IP sockets, MQTT, WebSockets, protocols. Message en | ards. | xim | ons. ity ne web s | Gatew 6 h 6 h 7 h Servid 8 h Servid N, 7 h | vays, |
| IoT reference Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies (7 Module:6 Industrial netw REST, TCP/II Protocol Buff Module:7 Time Series I | architectu and Data Senso Sensors Industria Industria Netwo 7 layer an ZigBee, B Netwo vork proto P and UD ers). | ares, Industrial Internet Reference Architecture, Edge Com a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing boa trial Systems 1 data acquisition systems, industrial control systems and the orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to Bluetooth, Serial Communication) ork protocols pocols (Modbus, CANbus), Communicating with cloud applic DP/IP sockets, MQTT, WebSockets, protocols. Message en Pata Processing and Storage | ards. | nction xim ns (v ing (es a | ons. ity ne web s JSOI | Gatew 6 h 6 h 7 h Servid 8 h Servid N, 7 h | vays, ours ours rking ces, |
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| | Total Lecture hours | : 45 hours |
|------|--|------------------|
| Text | xt Book(s) | · |
| 1. | Samuel Greengard, The Internet of Things, MIT Press Essential Knowledge Series, | 2015 |
| Refe | ference Books | |
| 1. | Ben Fry, Visualizing Data-Exploring and Explaining Data with the Processing Envir | onment, O'Reilly |
| | Media, 2008. | |
| 2. | Andrew K Dennis , Raspberry Pi Computer Architecture Essentials, Packt Publishing | g, 2016 |
| Mod | ode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| | | |
| | b Experiments | |
| 1. | Setting up the Arduino Development Environment, connecting analog sensors to an Boarding and reading analog sensor data | |
| 2. | Digital Input and Output reading using and Arduino board and Arduino Developm | |
| 3. | Integrate an Arduino Board to a Raspberry Pi computer, send sensor data from Ard | |
| 4. | Setup Python on the R Pi and run sample R Pi programs on the R Pi. Read the data using Python language | from Arduino |
| 5. | Connect a R Pi Camera module to the Raspberry Pi and using Python programming images and video | capture still |
| 6. | Set up TCP/IP socket server on a PC. Send a message from the R Pi to the PC using communication | g socket |
| 7. | Set up a MQTT broker on the PC. Send data from R Pi to PC using MQTT protocol from PC to R Pi using MQTT protocol | . Receive data |
| 8. | Connect LED lights to an Arduino. Connect the Arduino to the R Pi. Send Message via MQTT protocol. On receipt of the message , toggle the LED lights on the Ardu | |
| 9. | Set up an account in a cloud service (such as Google / AWS or Azure). Set up a simple using a language of your choice. Push the image captured from the R Pi camera to the On receiving the image, store the image in a database or file | |
| 10. | | |
| | Total Laboratory H | lours 30 hours |
| | ode of Assessment: Assessments/ Mid Term Lab/ FAT / Project | |
| | commended by Board of Studies 29-01-2021 | |
| App | proved by Academic Council No. 61 Date 18-02-2021 | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | Course Title | L | Т | Р | J | С |
|---|--|---------------------|----------|---------|---|-------------------|
| CBS3009 | Advanced Social, Text and Media Analytics | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | NIL | | | yllabu | s vei | sior |
| | | | | v. 1.0 | | |
| Course Objective | | _ | | | | |
| | e various tools for Text Mining and carry out Pattern Discover | • | | | | - |
| - | use of social network analysis to understand the growing con | nectiv | vity and | d com | plexi | ty i |
| | us on different scales | | | _ | | |
| | ial media analytics to identify important social actors, subgro | oups a | nd net | work | prope | ertie |
| in social media site | ż\$. | | | | | |
| Expected Course | A Outcome: | | | | | |
| | ntribution of text mining to generate new knowledge from nat | ural la | anoilao | e text | | |
| - | formation from the textual data using various classifiers and | | | ,e text | | |
| | ious components of a web that can be used for mining proces | | 1015 | | | |
| - | nedia data using appropriate web mining techniques | 6 | | | | |
| - | sting patterns from Social Media Networks using linear metho | de ano | 1 mode | ale | | |
| | ons to the emerging problems of social media analytics w | | | | lucie | an |
| opinion mining | sits to the emerging problems of social media analytics w | iui se | munne | in and | 1 y 51 5 | an |
| | | | | | | |
| Module:1 I | ntroduction to Text Mining | | | | 5 h | our |
| | xt Mining - Text Representation- Core text mining operations | s - Tex | kt mini | ing ap | | |
| | | | | 0 1 | | |
| Module:2 | Text Mining Essentials | | | | 6 h | our |
| Text mining Prepr | ocessing techniques - Text Clustering, Text Classification, To | pic M | odellir | ng, Pro | babi | listic |
| models for inform | ation extraction | | | | | |
| | | | | | | |
| | Veb Mining | | | | | our |
| Web Analytics - V | Web analytics tools, Clickstream analysis, A/B testing, onlir | ne surv | veys; V | Web s | earch | n and |
| • | | | | | | |
| - | | | | | | |
| retrieval | Veb Analytics Essentials | | | | 6 h | our |
| retrieval Module:4 | Veb Analytics Essentials mization, Web crawling and Indexing, Ranking algorithms, W | veb tra | ffic m | odels | 6 h | our |
| retrieval Module:4 | mization, Web crawling and Indexing, Ranking algorithms, W | ⁷ eb tra | ffic m | odels | | |
| retrieval Module:4 Search engine opti Module:5 | mization, Web crawling and Indexing, Ranking algorithms, W Social Media Networks | | | | 6 h | our |
| retrieval Module:4 Search engine opti Module:5 Social network a | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web crawling and Metworks and Metrices. Basic methods. Graphs and Matrices. Basic methods. | | | | 6 h | our |
| retrieval Module:4 Search engine opti Module:5 Social network a networks. Informa | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web crawling Networks and web data and methods. Graphs and Matrices. Basic methods tion visualization. | | | | <mark>6 h</mark> duals | our and |
| retrieval Module:4 Search engine opti Module:5 Social network a networks. Informa Module:6 | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web contained and methods. Graphs and Matrices. Basic method visualization. | easure | es for i | indivi | 6 h duals 7 h | our and our |
| retrieval Module:4 Search engine opti Module:5 Social network a networks. Informa Module:6 Making connection | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web contained and methods. Graphs and Matrices. Basic method visualization. Social Media Analytics bons: Link analysis. Random graphs and network evolution. | easure | es for i | indivi | 6 h duals 7 h | our and our |
| retrieval Module:4 Search engine opti Module:5 Social network a networks. Informa Module:6 Making connection | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web contained and methods. Graphs and Matrices. Basic method visualization. | easure | es for i | indivi | 6 h duals 7 h | our |
| retrieval Module:4 Search engine opti Module:5 Social network a networks. Informa Module:6 Making connection and identity; Social | mization, Web crawling and Indexing, Ranking algorithms, Web crawling and Indexing, Ranking algorithms, Web contained and methods. Graphs and Matrices. Basic method visualization. Social Media Analytics bons: Link analysis. Random graphs and network evolution. | easure | es for i | indivi | 6 h duals 7 h ffilia | our and our |





| Mo | dule:8 | Contemporary Issues | | | | 2 hour |
|----|-------------|------------------------------|-----------------------|--------------|-------------------|----------------|
| | | y Industry Experts or R&D or | | | | |
| | • | | 0 | Total | Lecture hours: | 45 hours |
| Te | xt Book(s) | | | | · | |
| 1. | Bing Liu, | Web Data Mining-Explorin | g Hyperlinks, Con | tents, and | Usage Data, Spr | inger, Second |
| | Edition, 20 | | | | | |
| 2. | | rani, Mohammad Ali Abba | asi and Huan Liu, | , Social M | Iedia Mining-An | Introduction, |
| | Cambridge | University Press, 2014. | | | | |
| Re | ference Boo | | | | | |
| 1. | 0 | entiment Analysis: Mining O | pinions, Sentiments | , and Emot | ions, Cambridge U | Jniversity |
| | Press, Seco | nd Edition, 2020. | | | | |
| 2. | | lman and James Sanger, The | U | | anced Approaches | s in Analyzing |
| | Unstructure | ed Data, Cambridge Universit | y Press, First Editio | on, 2009. | | |
| Mo | ode of Eval | uation: CAT / Assignment | t / Quiz / FAT / Pr | roject / Sei | minar | |
| Re | commended | l by Board of Studies | 29-01-2021 | | | |
| Ap | proved by A | cademic Council | No. 61 | Date | 18-02-2021 | |





| Course Cod | | Course Title | L | Τ | P | J | С |
|--|---|--|--|--|---|---|--|
| CBS3010 | | Mobile Computing | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | | NIL | | Syl | labus | | ion |
| | | | | | v. | 1.0 | |
| Course Object | | | | . 1 | 1 | 1 | . 11*. |
| | out var | ous wireless & cellular communication networks and vari | ous | telep | hone | and s | atellite |
| networks. | | | | | | | cc |
| | nowled | ge on various Adhoc and sensor networks routing pro | otoco | ol an | d ene | rgy e | efficient |
| protocol. | | | | | | | |
| | | vorking with Cognitive radio networks and recent telecom | | 1catio | on net | work | 8 |
| | | elopment of various network protocol using simulation to | ols. | | | | |
| Expected Cour | | | | | | | |
| After successful | lly con | pleting the course, the student should be able to | | | | | |
| 1. Understand | the | working principles of mobile networks and Con | ntras | st d | iffere | nt ty | pes of |
| telecommun | nicatio | n networks. | | | | | |
| • | | handoff management and wireless fundamentals. | | | | | |
| 3. Study on M | MANE | T and Sensor networks including architecture, routing | g ar | nd po | ower | optin | nizatior |
| technique. | | | | | | | |
| 4. Study on cog | gnitive | ratio networks and its applications. | | | | | |
| 5. Assess the re | ecent t | elecommunication networks, resource management | | | | | |
| | | • | | | | | |
| | | nent of various wireless network protocols using simulation | on to | ols | | | |
| 6. Design & de | evelopi | | on to | ools | | | 71 |
| 6. Design & de Module:1 I | evelopi Introd | uction | | | abita | | |
| 6. Design & de Module:1 I Overview of w | evelopi Introd | uction and mobile infrastructure; Preliminary concepts on ce | ellul | ar ar | | ture; | Design |
| 6. Design & de Module:1 I Overview of w objectives and p | evelopi Introd vireless perfor | uction and mobile infrastructure; Preliminary concepts on commance issues; Radio resource management and interface | ellul ; Pro | ar ar opag | ation | ture; and p | Design ath loss |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe | evelopi Introd vireless perfor el inter | uction and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig | ellul ; Pro | ar ar opag | ation | ture; and p | Design ath loss |
| 6. Design & de Module:1 I Overview of w objectives and p | evelopi Introd vireless perfor el inter | uction and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig | ellul ; Pro | ar ar opag | ation | ture; and p | Design ath loss |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- | Introd Introd vireless perfor el inter - 1G to | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig 5G. | ellul ; Pro | ar ar opag | ation | ture; and p es; O | Design ath loss verview |
| Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I | evelopp Introd vireless perfor el inter - 1G to Locati | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig 5 5G. | ellul ; Pro gnme | ar ar opag ent st | ation rategi | eture; and p es; O | ath loss verview 8 hours |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to | Introd vireless perfor el inter - 1G to Locati | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assign 5G. on and handoff management on management (HLR and VLR); Mobility models cha | ellul ; Pro gnme racte | ar ar opag ent st | ation rategi ng ind | eture; and p es; O | Design ath loss verview 8 hours al node |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Ran | Introd vireless perfor el inter - 1G to Locati ndom | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility | ellul ; Pro gnme racto | ar ar opag ent st erizin | ation rategin ng ind chara | eture; and p es; O lividu | Desigr ath loss verview 8 hours al node zing the |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Ran movement of g | Introd vireless perfor - 1G to Locati ndom groups | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode | ellul ; Pro gnme racto 7 mo 1, Co | ar ar opag ent st erizin odels | ation rateging ng ind chara unity | eture; and p es; O lividu cteriz base | Design ath loss verview 8 hour al node zing the d group |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Ran movement of g mobility model) | Introd vireless perfor el inter - 1G to Locati ndom groups); Stati | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode c (Always vs. Never update, Reporting Cells, Location A | ractor / mo | ar ar opag ent st erizin odels omm) and | ation rategion ng ind chara unity l Dyn | eture; and p es; O lividu cteriz base amic | Design ath loss verview 8 hour al node zing the d group location |
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| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Ran mobility model) management scl Sequential pagin | Introd vireless performel inter - 1G to Locati o locati ndom groups); Stati hemes ing); L | uction a and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode c (Always vs. Never update, Reporting Cells, Location A (Time, Movement, Distance, Profile Based); Terminal Pa ocation management and Mobile IP; Overview of handof | ; Pro gnme racto / mo l, Co reas aging | ar ar opag ent st erizin odels omm) and g (Sin ocess | ation rateging ng ind chara unity l Dyn nultan s; Fac | eture; and p es; O lividu acteriz base amic neous tors a | Design ath loss verview 8 hours al node zing the d group location paging ffecting |
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| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Rar movement of g mobility model) management sch Sequential pagin handoffs and pe horizontal, vertie | Introd vireless perfor el inter - 1G to Locati ndom groups); Stati hemes ing); L erform ical). | uction a and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode c (Always vs. Never update, Reporting Cells, Location A (Time, Movement, Distance, Profile Based); Terminal Pa ocation management and Mobile IP; Overview of handof | ; Pro gnme racto / mo l, Co reas aging | ar ar opag ent st erizin odels omm) and g (Sin ocess | ation rateging ng ind chara unity l Dyn nultan s; Fac | eture; and p es; O lividu acteriz base amic neous tors <i>a</i> fs (so | Design ath loss verview 8 hour al node zing the d group location paging ffecting |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Rar movement of g mobility model) management scl Sequential pagin handoffs and pe horizontal, vertice Module:3 V | evelopi Introd vireless perfor el inter - 1G to Locati o locati ndom groups); Stati hemes ing); L erform ical). | uction s and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode c (Always vs. Never update, Reporting Cells, Location A (Time, Movement, Distance, Profile Based); Terminal Pa ocation management and Mobile IP; Overview of handof ance evaluation metrics; Handoff strategies; Different ty | i pro- constant of the second | ar ar opag ent st erizin odels omm) and g (Sin ocess of ha | ation rateging ng ind chara unity l Dyn nultan s; Fac undof | eture; and p es; O lividu acteriz base amic heous tors a fs (so | Design ath loss verview 8 hour al node zing the d group location paging ffecting ft, hard 7 hour |
| 6. Design & de Module:1 I Overview of w objectives and p models; Channe of generations:- Module:2 I Introduction to movement (Rar movement of g mobility model) management scl Sequential pagin handoffs and pe horizontal, vertice Module:3 V | evelopi Introd vireless perfor - 1G to - 1G to | uction a and mobile infrastructure; Preliminary concepts on comance issues; Radio resource management and interface ference and frequency reuse; Cell splitting; Channel assig o 5G. on and handoff management on management (HLR and VLR); Mobility models cha walk, Fluid flow, Markovian, Activity based); Mobility of nodes (Reference point-based group mobility mode c (Always vs. Never update, Reporting Cells, Location A (Time, Movement, Distance, Profile Based); Terminal Pa ocation management and Mobile IP; Overview of handof ance evaluation metrics; Handoff strategies; Different ty ss transmission fundamentals | illul i; Programe gnme gnme racte y mo l, Co reas aging ff pr y hc | ar ar opag ent st erizin odels omm) and g (Sin ocess of ha | ation rateging ng ind chara unity l Dyn unita s; Fac undoff | eture; and p es; O lividu acteriz base amic neous tors <i>a</i> fs (so | Design ath los verview 8 hour al node zing the d group location paging ffecting ft, hard 7 hour ction to |
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| Modu | | Mobile Ad-hoc networks | | | | | 4 hours |
|--------|-----------|-------------------------------|--------------------|----------------|------------|-----------|--|
| Chara | cteristic | s and applications; Coverage | and connectivity | problems; R | louting in | n MANE | Ts. |
| | | | | | | | |
| Modu | | Wireless sensor networks | | | | | 5 hours |
| | 1 | sic architecture, design ob | | | 0 | | 0 |
| | | d connectivity; Sensor plac | | iying and a | Iggregati | on; Ene | ergy consumption; |
| Cluste | ering of | sensors; Energy efficient Ro | uting (LEACH). | | | | |
| N. I | | | | | | | 51 |
| Modu | | Cognitive radio networks | | we at an a atu | | ain a. C | 5 hours |
| | | ynamic spectrum access; | | | | | pectrum snaring; |
| Intero | peraolii | ty and co-existence issues; A | pprications of cog | intive radio | network | | |
| Modu | ıle:7 | D2D communications in | 5G cellular netwo | orks | | | 7 hours |
| | | to D2D communications; H | | | G archit | ecture: I | |
| | | e management, power contro | | | | | |
| in 5G. | | | | ion prooren | , | | •••••••••••••••• |
| | | | | | | | |
| Modu | ıle:8 | Contemporary Issues | | | | | 2 hours |
| Guest | lecture | by Industry Experts or R&I | Oorganization | | | | |
| | | | | Total] | Lecture | hours: | 45 hours |
| Text | Book(s |) | | | | | |
| 1. | Jochen | Schiller, Mobile Communica | tions. Pearson Edu | ucation, 200 | 9. | | |
| 2. | Andrea | Goldsmith, Wireless Comm | unications. Cambri | dge Univers | sity Press | s, 2012. | |
| Refer | ence B | ooks | | | | | |
| 1. | Ivan Ste | ojmenovic, Handbook of Wir | eless Networking | and Mobile | Comput | ing, Wile | ey, 2002. |
| 2. | Ezio Bi | iglieri, Andrea J. Goldsmith | . Larry J. Greenst | ein. Narava | n Manda | avam an | d H. Vincent Poor. |
| | | les of Cognitive Radio. Camb | - | - | | J | ······································ |
| | 1 | aluation: CAT / Assignme | 0 . | , | Semina | r | |
| | | | | /110jeee/ | Semme | | |
| Listo | f Chall | enging Experiments (Indi | ootivo) | | | | |
| Design | n and D | evelopment of different wire | eless network prot | ocols using | network | simulato | ors such as NS-3 / |
| | ET++. | evelopment of unferent with | cless network prot | Jeons using | network | Sintanate | |
| | MAC P | rotocol | | | | | |
| | | g Protocol | | | | | |
| | | ort Protocol | | | | | |
| | 1 | stion Control Protocol | | | | | |
| 5 | Applica | tion Protocol | | | | | |
| 6 | Security | y Protocol | | | | | |
| | | | | Total | hours | | 30 Hours |
| Mode | e of Ass | essment: Assessments/ M | | AT / Proje | ct | | |
| | | ed by Board of Studies | 29-01-2021 | • | | | |
| Appr | oved by | y Academic Council | No. 61 | Date | 18-02- | 2021 | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | | L | Τ | P | J | С |
|--|---|--|--|--|--|---|
| CBS3013 | | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | | Syl | | | rsion |
| Course Objectives: | | | | v.1. | 0 | |
| 0 | acquire knowledge on chatbots and its terminologies | | | | | |
| | e learning concepts and different algorithms to build custom mod | dal | | | | |
| | versational experiences and provide better customer experiences | | | | | |
| 5. Understand on con- | versational experiences and provide better customer experiences |) | | | | |
| Expected Course O | itcome: | | | | | |
| 1. Understand the fun | damentals of conversational systems and foundational blocks of | f pro | grar | nmir | ng. | |
| 2. Apply the natural la | nguage processing techniques in building conversational systems | s. | | | | |
| 3. Design and build cl | natbots and conversational intelligent systems. | | | | | |
| 4. Analyse the signi | ficance of machine learning methods and artificial intelligen | nce i | in c | onve | ersati | ional |
| technologies. | | | | | | |
| 5. Perform the analyti | cs on conversational systems using performance metrics. | | | | | |
| | | T | | | | |
| | lamentals of Conversational Systems | | | | | ours |
| Introduction: Overvi | ew, Case studies, Explanation about different modes of enga | agen | nent | for | a hu | ıman |
| Intelligence and Ma Introduction to Top (Facebook, WhatsAp | mpact of AI. Underlying technologies: Natural Language F chine Learning, NLG, Speech-To-Text, Text-To-Speech, C players in Market – Google, MS, Amazon & Market trends. I p) and Smart speakers – Alexa, Google Home and other new o | Proc Comj Mes | pute ssag | ng, r Vi ing l | ision Platf | etc orms |
| Intelligence and Ma Introduction to Top (Facebook, WhatsAp Legal Considerations | chine Learning, NLG, Speech-To-Text, Text-To-Speech, C players in Market – Google, MS, Amazon & Market trends. I p) and Smart speakers – Alexa, Google Home and other new o in AI Overview. | Proc Comj Mes | pute ssag | ng, r Vi ing l | ision Platf hica | etc orms 1 and |
| Intelligence and Ma Introduction to Top (Facebook, WhatsAp Legal Considerations Module:2 Four | chine Learning, NLG, Speech-To-Text, Text-To-Speech, C players in Market – Google, MS, Amazon & Market trends. 1 p) and Smart speakers – Alexa, Google Home and other new of in AI Overview. | Proc Comj Mes char | pute ssag nnel | ng, r Vi ing l | ision Platf hica | orms orms 1 and |
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| Intelligence and Ma Introduction to Top (Facebook, WhatsAp Legal Considerations Module:2 Four Basic Python program | chine Learning, NLG, Speech-To-Text, Text-To-Speech, C players in Market – Google, MS, Amazon &Market trends. 1 p) and Smart speakers – Alexa, Google Home and other new of in AI Overview. Indational Blocks for Programming ming concepts, Node Basics, Coding Best Practices, Evaluation | Proc Comj Mes char | pute ssag nnel | ng, r Vi ing l | ision Platf hica 2 h | i etc. forms 1 and |
| Intelligence and Ma Introduction to Top (Facebook, WhatsAp Legal Considerations Module:2 Four Basic Python program Module:3 Natu | chine Learning, NLG, Speech-To-Text, Text-To-Speech, C players in Market – Google, MS, Amazon &Market trends. 1 p) and Smart speakers – Alexa, Google Home and other new of in AI Overview. | Proc Comj Mes char | pute ssag nnel | ng, r Vi ing l s. Et | ision Platf hica 2 h | orms orms 1 and ours |
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| PC | I.Building a | Voice/Chat Bot, Case Stud | ly | | | |
|-----------|-----------------|---|---------------------|----------------|-------------------------------|---------------------------|
| Mo | odule:5 | Role of ML/AI in Conv | ersational Tech | nologies | | 6 hours |
| Un | derstanding | g on how Conversational S | Systems uses ML | technologie | s in ASR, NLP, | Advanced Dialog |
| ma | nagement, | Language Translation, En | notion/Sentiment | Analysis, Ir | nformation extra | action, etc. to |
| effe | ectively con | nverse. Case Study. | | | | |
| N/- | | Contract Contract | | | | 4 1 |
| | odule:6 | Contact Centres O Contact centres – Impac | t & Terminologi | as Casa stur | ties & Trends | 4 hours |
| | | nt in contact centre | t & Terminologi | es, Case siuc | lies & Hends, | scope of a virtual |
| ng | CIII/ / 15515ta | | | | | |
| Mo | odule:7 | Overview on Conversat | ional Analytics | | | 3 hours |
| Co | nversation | Analytics: The need of it, | • | Conversation | al Metrics, Sum | mary, Robots and |
| Ser | nsory Appli | ications overview, XR Tech | hnologies in Cor | | | |
| tecl | hnologies a | nd market innovations overv | view. | | | |
| Mo | odule:8 | Contemporary Issues | | | | 2 hours |
| | | | Denseniaction | | | 2 11001 5 |
| Gu | est lecture t | by Industry Experts or R&I | Dorganization | Total L | ecture hours: | 45 hours |
| To | xt Book(s) | | | I Utai L | ceture nours. | 45 110015 |
| 1. | | IcTear, Conversational AI: | Dialogue Systems | Conversatio | nal Agents and a | hathots 2020 1st |
| 1. | | forgan and Claypool. | Dialogue Systems | , Conversatio | mai Agents and c | <i>Indioots</i> , 2020, 1 |
| 2. | | ando D Haro, Zoraida Calle | eias Satosh Naka | mura Conve | rsational Dialog | me Systems for the |
| | | ade, 2021,1 st Edition, Spring | | inuiu, conve | | , ac by stering for the |
| Re | ference Bo | | , | | | |
| 1. | | rthanam, Chatbots and Conv | versational UI De | velopment, 2 | 017, 1 st Edition, | Packt Publishers. |
| 2. | | ez-marin and Ismael Pascua | | = | | |
| | | n, 2011, 1 st Edition, IGI Glo | | e | | 0 0 |
| Mo | ode of Eva | luation:CAT / Assignme | ent / Quiz / FAT | / Project / S | Seminar | |
| | | | | | | |
| | | nging Experiments (Indi | | | · • | |
| 1. | - | basics of python programm | ning related to con | iversational A | 41 | |
| 2. | - | ntation of lexical analysis | | | | |
| 3. | 1 | ntation of syntactic analysis | | | | |
| 4. | - | entation of Sentimental Anal | • | | • | |
| 5. | - | entation of natural language | processing using | python librar | ies. | |
| 6. | Ŭ | of chatbot frameworks | | | | |
| 7. | | entation of voice bots entation of a generic chat be | ot | | | |
| о. 9. | | entation of a bot for a class | | nnlication | | |
| 9. 10. | 1 | entation of a bot for a simple | | 11 | 1 | |
| 10. | Impleme | | - | tal Laborato | | 30 Hours |
| Mo | de of Asse | ssment: Assessments/ M | | | | 50 110015 |
| | | ed by Board of Studies | 22-05-2021 | | | |
| Ap | proved by | Academic Council | No. 62 | Date | 16-07-202 | 21 |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title L | Т | Р | J | C |
|--|--|------------------------------------|--|---|---|
| CBS3014 | Modern Web Applications 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | Sylla | | versio | n |
| | | | v.1. | 0 | |
| Course Objectives | | 40.001 | ~ | | |
| - | nd analyse the basic concepts of web programming and internet pro | locol | s. | | |
| | he client-server model of Internet programming works. | | | | |
| 3. To demonstrates t | he uses of scripting languages and their limitations. | | | | |
| Expected Course (|)utcome. | | | | |
| A | protocols and web architecture. | | | | |
| | CSS effectively to create interactive websites. | | | | |
| | side scripting using JavaScript to design dynamic websites. | | | | |
| - | sed web applications. | | | | |
| = | side scripting using PHP. | | | | |
| 1 | cation with Database connectivity. | | | | |
| | cation with Database connectivity. | | | | |
| Module:1 Introd | uction to Internet & World Wide Web | | | 4 he | our |
| | net & World- Wide Web, Web Browsers, Web Servers, Uniform | Reso | ource | | |
| | ramming Languages. Web Standards, Categories of Web Applicati | | | | |
| | | · · · · · | | | החוו |
| of Web Application | s. Tiered Architecture | | | | sucs |
| of Web Application | s, Tiered Architecture | | | | |
| | | (CSS | | | |
| Module:2 Hyper | text Mark Up Language (HTML) and Cascading Style Sheets | | S) | 6 h | ours |
| Module:2 Hyper Basic HTML page, | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E | lemei | S) nts, C | 6 h Casca | ours ding |
| Module:2 Hyper Basic HTML page, Style Sheets: Inline | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text | lemei | S) nts, C | 6 h Casca | ours ding |
| Module:2 Hyper Basic HTML page, | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text | lemei | S) nts, C | 6 h Casca | ours ding |
| Module:2 Hyper Basic HTML page, Style Sheets: Inline components drop de | Text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text own | lemei | S) nts, C | 6 h Casca rms, (| ours ding CSS |
| Module:2HyperBasic HTML page,Style Sheets: Inlinecomponents drop doModule:3Java S | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text own | lemeı t, CS | S) nts, C S for | 6 ho Cascae rms, 0 | ours ding CSS urs |
| Module:2HyperBasic HTML page,Style Sheets: Inlinecomponents drop doModule:3Java SIntroduction to Java | text Mark Up Language (HTML) and Cascading Style SheetsText Formatting, Table, Headers, Linking, Images, List, Meta EandExternal Style Sheet, Bootstrap - CSS TextowncriptScripts, Objects in Java Script, Dynamic HTML with Java Script, E | lemeı t, CS | S) nts, C S for | 6 ho Cascae rms, 0 | ours ding CSS urs |
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| Module:2HyperBasic HTML page,Style Sheets: Inlinecomponents drop doModule:3Java SIntroduction to JavaJS Button, JS popovModule:4ExtenIntroduction, StructLanguage TransformModule:5BasicIntroduction to PHPModule:6Server | Text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text own cript Scripts, Objects in Java Script, Dynamic HTML with Java Script, E er, Document Object Model (DOM) with JavaScript sible Markup Language (XML) uring Data, Document Type Definition, XML Vocabularies, Ex s (XSL) PHP Programs , Numbers and Strings, Literals and Variables, Operators and Funct | lemen t, CS Bootst ttensi | S) nts, C S for rap - ble S array | 6 ho Cascae rms, 0 8 ho JS A 6 ho Styles 6 ho ys. 7 ho | ours ding CSS urs lert, heet |
| Module:2HyperBasic HTML page,Style Sheets: Inlinecomponents drop doModule:3Java SIntroduction to JavaJS Button, JS popovModule:4ExtenIntroduction, StructLanguage TransformModule:5BasicIntroduction to PHPModule:6Server | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text own cript Scripts, Objects in Java Script, Dynamic HTML with Java Script, E er, Document Object Model (DOM) with JavaScript sible Markup Language (XML) uring Data, Document Type Definition, XML Vocabularies, Ex s (XSL) PHP Programs , Numbers and Strings, Literals and Variables, Operators and Funct -Side Processing cols, Using Values Returned From, Forms Using PHP - User Authe | lemen t, CS Bootst ttensi | S) nts, C S for rap - ble S array | 6 ho Cascae rms, 0 8 ho JS A 6 ho Styles 6 ho ys. 7 ho | ours ding CSS urs lert, heet |
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| Module:2 Hyper Basic HTML page, Style Sheets: Inline components drop do Module:3 Java S Introduction to Java JS Button, JS popov Module:4 Exten Introduction, Struct Language Transform Module:5 Basic Introduction to PHP Module:6 Server Creating Form Contr Session, Authorizat | text Mark Up Language (HTML) and Cascading Style Sheets Text Formatting, Table, Headers, Linking, Images, List, Meta E , Internal and External Style Sheet, Bootstrap - CSS Text own cript Scripts, Objects in Java Script, Dynamic HTML with Java Script, E er, Document Object Model (DOM) with JavaScript sible Markup Language (XML) uring Data, Document Type Definition, XML Vocabularies, Ex s (XSL) PHP Programs , Numbers and Strings, Literals and Variables, Operators and Funct -Side Processing cols, Using Values Returned From, Forms Using PHP - User Authe | lemen t, CS Bootst ttensi | S) nts, C S for rap - ble S array | 6 ho Cascae rms, 0 8 ho JS A 6 ho Styles 6 ho ys. 7 ho | ours ding CSS lert, heet ours ing |





| Conn | nection, Inserting, Viewing, Updating a | nd Deleting Record | s, Manipul | ating joined tables. | |
|-------|---|----------------------|--------------------------|----------------------------------|----------------------------|
| | lule:8 Contemporary issues | | | | 2 hours |
| Guest | t lecture by industry experts | | | F | |
| | | | Total Le | cture hours: | 45 hours |
| | Book | | | | |
| 1. | Paul Deitel, Harvey Deitel, Abbey D | eitel, Internet & W | orld Wide | Web - How to Pro | gram, 2020 6 th |
| | edition, Pearson Education. | | | | |
| Refe | erence Books | | | | |
| 1. | Fritz Schneider, Thomas Powell, Java Hill. | Script – The Comp | lete Refere | nce, 2017, 3 rd Editi | on, McGraw |
| 2. | Steven Holzener, PHP – The Complete | te Reference,2017, | 1 st Edition, | Mc-Graw Hill | |
| Mad | le of Evoluctions CAT / Aggiggman | at / Ousig / EAT / 1 | Duciaat / S | aminan | |
| | le of Evaluation: CAT / Assignmer of Experiments | nt / Quiz / FAT / J | roject / S | eminar | |
| 1. | Design static web pages required for a | an online book store | e web site u | using HTML and C | SS |
| 2. | a. Write JavaScript program to validat | e the fields require | d for Book | Store - registration | page. |
| | b. Create and Validate the Login page | | | | |
| | c. After successful login, update the bo | ook details dynamic | ally. | | |
| 3. | a. Write an XML file which will displa | ay the Book inform | ation which | n includes the follow | wing: |
| | Title of the book, Author Name, ISB | N number, Publish | er name, Eo | dition, Price | C |
| | b. Write a Document Type Definition | (DTD) to validate | the above | XML file. | |
| 4. | a. Write PHP Program to Convert all | the previous forms | (Book Stor | re Registration Pag | e and Login |
| | Page) to PHP forms. | 1 | ` | 6 6 | C |
| | b. Define Cart to select books and num | mber of books, mai | ntain Sess | ion for the page. | |
| | c. Validate the Session data before co | | | 1 0 | |
| 5. | Write a PHP Code to make database of | | | us CRUD operatio | ns |
| l | | 1 | | otal Laboratory H | |
| Mod | e of Assessment: Assessments/Mid | term Exam/FAT | | ····· J | |
| Reco | ommended by Board of Studies | 22-05-2021 | | | |
| App | roved by Academic Council | No. 62 | Date | 15-07-2021 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| CBS301 | de | Course Title L | Т | P | J | C |
|--|---|---|--|---|---|--|
| | 5 | Information Systems Audit and Control 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | | NIL S | yllab | | | n |
| | • | | ١ | 1.1.0 | | |
| Course Object | | | | | | |
| | - | bout IS Auditing procedures | | | | |
| | 1 | isition and development of IS controls | | | | |
| 3.Implementatio | on of Dis | saster Recovery Planning in an organization | | | | |
| E | 0.4 | | | | | |
| Expected Court | | | | | | |
| • • | | es involved in auditing process. | | | | |
| - | | cies, procedures and standards in Information System managemen | It | | | |
| | | recovery plan and Business Continuity Plan | | | | |
| - | | ce and support activities in ISA | | | | |
| 5. Understand t | he IS net | twork Infrastructure and assets protection | | | | |
| Module:1 | Proco | ss of Auditing IS | | | 6 ho | |
| | | it Function – Risk Analysis – Internal Controls – Performing an IS | S Auc | | | |
| - | | volving IS Audit process | 5 Aut | 11t – | Con | 10 |
| Sen-assessment | | worving is Addit process | | | | |
| Module:2 | Gover | mance and Management of IT | | | 7 ho | ur |
| Corporate Gove | | - IS Strategy – IT Investment and allocation processes - Policies | and P | roce | edure | es - |
| - | | | | | | |
| Risk Manageme | m = 10 | Management practices -15 Organizational structure and responsib | bilities | $- \Gamma$ | มนธาก | ess |
| - | | Management practices –IS Organizational structure and responsib uditing Business Continuity | oilities | – C | busin | ess |
| - | | uditing Business Continuity | | — р | Jusin | ess |
| Continuity Plan | ning – A | uditing Business Continuity | | | 7 ho | |
| Continuity Plan Module:3 | ning – A IS Op | erations, Maintenance and Support | | | 7 ho | ur |
| Continuity Plan Module:3 IS Operations- | ning – A IS Op IS Har | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastrue | | | 7 ho | ur |
| Continuity Plan Module:3 | ning – A IS Op IS Har nd Oper | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastrue | | - A | 7 ho | ur ing |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 | ning – A IS Op IS Har nd Oper IS Ac | erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastructure ations | cture | — A | 7 ho Audit 7 ho | ur ing ur |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 | ning – A IS Op IS Har nd Oper IS Acc cation C | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastrue ations quisition, Development and DRP | cture | — A | 7 ho Audit 7 ho | ur inş ur |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applie | ning – A IS Op IS Har nd Oper IS Acc cation C | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastrue ations quisition, Development and DRP | cture | — A | 7 ho Audit 7 ho | ur ing ur |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applie | ning – A IS Op IS Har nd Oper IS Ac cation C ing | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastrue ations quisition, Development and DRP | cture | — A | 7 ho Audit 7 ho | ur: ing ur: |
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| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applia Recovery Plann Module:5 Importance of Auditing Inform Physical Access Module:6 IT processes - S | IS Op IS Hard nd Oper IS Act cation C ing Protect Informa mation S Exposu Systems | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastructure ations quisition, Development and DRP ontrols – Auditing Systems Development Acquisition and Maintee ction of Information Assets tion Security Management - Logical Access – Network Infrastructure Security Management Framework res and Controls | enance tructure | re Sil Cc | 7 ho Audit 7 ho Disas 8 ho ecuri ontro | ur ing ur ste ity 1 - |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applie Recovery Plann Module:5 Importance of Auditing Inform Physical Access Module:6 IT processes - S Maintenance- O | ning – A IS Op IS Hard nd Oper IS Act cation C ing Protect Information S Exposu Systems pen Systems | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastructure ations quisition, Development and DRP ontrols – Auditing Systems Development Acquisition and Maintee ction of Information Assets tion Security Management - Logical Access – Network Infrastructures Security Management Framework res and Controls m Management Software - Label Checking - Library Protection – Memory Pr | enance tructure | - A e -] re S l Cc | 7 ho Audit 7 ho Disas 8 ho ecuri ontro 4 ho Syste | ur ing ste ur ity 1 - |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applia Recovery Plann Module:5 Importance of Auditing Inform Physical Access Module:6 IT processes - S Maintenance- O Module 7 | IS Op IS Hard nd Oper IS Act cation C ing Protect Informa mation S Exposu Systems pen Systems pen Systems | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastructure ations quisition, Development and DRP ontrols – Auditing Systems Development Acquisition and Maintee ction of Information Assets tion Security Management - Logical Access – Network Infrast Security Management Framework - Environmental Exposure res and Controls m Management Software - Label Checking - Library Protection – Memory Prote ems – Database Technology - Auditing DBMS Recovery | enance enance tructure tection | - A ee -] re S I Cc | 7 ho Audit 7 ho Disas 8 ho ecuri ontro 4 ho Syste 4 ho | ur ing ste ur ity l - ur ur |
| Continuity Plan Module:3 IS Operations- Infrastructure a Module:4 Auditing Applie Recovery Plann Module:5 Importance of Auditing Inform Physical Access Module:6 IT processes - S Maintenance- O Module 7 Application Ris | IS Op IS Hard nd Oper IS Act cation C ing Protec Informa mation S Exposu Systems pen Systems pen Systems ks- End | uditing Business Continuity erations, Maintenance and Support dware –IS Architecture and Software – IS Network Infrastructure ations quisition, Development and DRP ontrols – Auditing Systems Development Acquisition and Maintee ction of Information Assets tion Security Management - Logical Access – Network Infrastructures Security Management Framework res and Controls m Management Software - Label Checking - Library Protection – Memory Pr | enance enance tructures and tection | = A $= -1$ $= -1$ $= -1$ $= -1$ $= -1$ $= -5$ $= -5$ $= -5$ | 7 ho Audit 7 ho Disas 8 ho ecuri ontro 4 ho Syste 4 ho | ur in; ur ste ur ity 1 - ur ks |





| Mo | dule 8 | Contemporary Issues | | | | 2 hours |
|-----|-----------------------|--------------------------------|---------------------|-------------------------|------------------------|----------------|
| Gue | est lecture l | by Industry Experts or R&D of | organization | | · | |
| | | | | Total Le | cture hours: | 45 hours |
| Te | xt Book(s) | | | | · | |
| 1. | Sandra S | enft, Frederick Gallegos, Al | eksandra Davis, I | nformatio | n Technology Cont | rol and Audit, |
| | 2013, 4 th | edition, Auerbach Publications | 5. | | | |
| 2. | Angel R. | Otero, Information Technolog | y Control and Auc | lit, 2019, 5 | th edition, CRC Pres | ss. |
| Ref | ference Bo | ooks | | | | |
| 1. | Jack J. Cl | hamplain, Auditing Informatic | n Systems, 2003, 2 | nd edition, | Wiley publishers. | |
| 2. | Ron Web | er, Information System Control | ol and Audit, 2014, | 4 th edition | n, Pearson Publication | on |
| Mo | de of Eva | luation: CAT / Assignmer | nt / Quiz / FAT /] | Project / S | Seminar | |
| Re | commende | ed by Board of Studies | 22-05-2021 | | | |
| Ap | proved by | Academic Council | No. 62 | Date | 15-07-2021 | |





| Course Code | Course Title | L | Т | P | J | С |
|--|--|---|---|--|--|--|
| CBS3016 | Cognitive Science & Analytics | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | | Syll | abus | vers | sion |
| | | | | v. 1 | .0 | |
| Course Objectives | | | | | | |
| To understand t is an interdisci Science, Lingui To develop skill contribute to co To understand approaches, neu Expected Course To understand Learn and undo To demonstrate suitable method | he way in which cognitive science is methodologically distin- plinary field where established fields of research—includ istics, Neuroscience. Is in analyzing, interpreting, and assessing the empirical data ognitive science. central modeling techniques in cognitive science, includin- tral network/deep learning approaches, and dynamical approa | and r and r g trac iches. | Psych esear ditior | olog ch teo nal co | y, Co chniq ompu licatio | ompute ues that tationa |
| 5. Envisage the c | inderstand and apply declarative and logic models oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr | 000000 | ina a | nd a | onlic | ation o |
| Envisage the c To demonstrat different researchemic | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science | ocess | sing a | nd aj | | |
| Envisage the c To demonstrat different resea Module:1 Int | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science | | | | | 7 hour |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Introduction to the Categories and concernance | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman | age: (| defin | ition | Affo | 7 hour rdance |
| Envisage the c To demonstrate different research different rese | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. | age: (| defin | ition | Affo | 7 hour rdance) Direc |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Int Introduction to the Categories and conception, Logic; N Module:2 Context | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. | age: (tics, (| defin and p | ition pragm | Affonatics | 7 hour rdance) Direc 7 hour |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Introduction to the Categories and conception, Logic; M Module:2 Conception A brief history of c Syntax, semantics, concerns in philoso | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. | age: (tics, (brain, mem | defin and p Ling | ition pragm quistic s Me | Affo natics | 7 hour rdance) Direc 7 hour wledge |
| 5. Envisage the c 6. To demonstrate different research different resear | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. ncept Hierarchies cognitive science. Processing of sensory information in the l , (and pragmatics), Ecological Psychology, constructing phy, Discretization and generating concept hierarchies, Data ce learning in robotics, Explicit vs. implicit memory | age: (tics, (brain, mem | defin and p Ling | ition pragm quistic s Me | Affo natics c kno thodo n, Ger | 7 hour rdance) Direc) Direc 7 hou r wledge ologica nerativ |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Introduction to the Categories and conception, Logic; M Module:2 Content of the Categories in the Categories of the Categories and concept on the Categories and | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. ncept Hierarchies cognitive science. Processing of sensory information in the l , (and pragmatics), Ecological Psychology, constructing phy, Discretization and generating concept hierarchies, Data ce learning in robotics, Explicit vs. implicit memory natomy of brain ce and psychology, Brain Imaging, Brain and language, Affe sing (three-boxes) model of memory Structure and constitue | age: o tics, (brain, mem Mini ordance | definition of the least of the | ition pragm guistic s Me ystem urning prain | Affonatics e knot thodo , Gen g in r | 7 hour rdance) Direc 7 hour wledge ologica nerativ 7 hour obotics fMRI, |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Introduction to the Categories and conception, Logic; N Module:2 Contemport of the Contemport of the Contemport of the Contemport of the Categories and concerns in philoso concerns in philoso linguistic, Affordated Module:3 A Artificial intelligent of the Categories of the Categories of the Contemport of the Categories of th | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language princh approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. ncept Hierarchies cognitive science. Processing of sensory information in the learning , (and pragmatics), Ecological Psychology, constructing phy, Discretization and generating concept hierarchies, Data ce learning in robotics, Explicit vs. implicit memory natomy of brain ce and psychology, Brain Imaging, Brain and language, Affe sing (three-boxes) model of memory Structure and constitue isorders, Development Information processing (three-boxe) | age: o tics, (brain, mem Mini ordance | definition of the least of the | ition pragm guistic s Me ystem urning prain | Affo natics c kno thodo n, Gen g in r | 7 hour rdance) Direc 7 hour wledg ologic: nerativ 7 hour obotic: fMRI, y. |
| 5. Envisage the c 6. To demonstrate different researed Module:1 Introduction to the Categories and conception, Logic; M Module:2 Content of the Categories and conception, Logic; M Module:2 Content of the Categories and conception, Logic; M Module:2 Content of the Categories and conception, Logic; M Module:3 A brief history of the Categories in philoso linguistic, Affordate Module:3 A Artificial intelligence Information process MEG, Language diamonder of the Categories and conception and the Categories and | oncept of cognitive learning te the acquired inter-disciplinary knowledge in language pr arch approaches with cognitive science roduction to Cognitive Science study of cognitive sciences. Neural Network Models- langu cepts; Concept learning: Linguistic knowledge: Syntax, seman Machine learning. ncept Hierarchies cognitive science. Processing of sensory information in the l , (and pragmatics), Ecological Psychology, constructing phy, Discretization and generating concept hierarchies, Data ce learning in robotics, Explicit vs. implicit memory natomy of brain ce and psychology, Brain Imaging, Brain and language, Affe sing (three-boxes) model of memory Structure and constitue | age: (tics, (brain, mem Mini ordance ents of es) m | defin (and p Ling nories ng S ce lea f the b odel | ition pragm guistic s Me ystem urning prain of me | Affonatics e kno thodo , Gen g in r | 7 hour rdance) Direc 7 hour wledg ologic: nerativ 7 hour obotic: fMRI, y. |



| Mad | ule:5 | Songowy Information fusion | 5 hours |
|--------------|------------------------|--|------------------------|
| | | Sensory Information fusion nodels Information fusion, the great past tense debate, Human visu | 5 hours |
| | | pect theory; Heuristics and biases Looking at brain signals. | ai attention, bounded |
| Tation | lanty, 1105 | beet theory, fiedfisties and blases booking at brain signals. | |
| Mod | ule:6 | Modelling | 6 hours |
| | | to cognition, The great past tense debate, Computational mode | |
| | | omputers, Cybernetics, Cognitivist and emergent stand points, Con | , |
| | - | oints in social cognition, | 1 |
| | , , , , , | | |
| Mod | ule:7 | Information processing | 5 hours |
| Proce | essing of se | ensory information in the brain. From physics to meaning, Analog vs. | Digital: Code duality. |
| | - | ective, Applications of computational models of attentional Context and | |
| | nas; Social | | J C / |
| | | | |
| Mod | ule:8 | Contemporary issues | 2 hours |
| Guest | t lecture by | Industry Experts or R&D organization | |
| | | Total Lecture hours | 45 hours |
| | Book | | |
| 1. | _ | KumarMallick, Samarjeet Borah," Emerging Trends and Applic | cations in Cognitive |
| | 1 | g", 2019, IGI Global Publishers. | |
| Refe | rence Boo | | |
| 1. | | Bermudez, "Cognitive Science: An Introduction to the Science | of the Mind", 2020 |
| | - | e University Press, New York. | |
| Mod | e of Evalu | ation: CAT / Assignment / Quiz / FAT / Project / Seminar | |
| T • 4 | | | |
| | | ging Experiments (Indicative) | |
| 1. | | and practice: Cognitive Science and its methodology concerns in philo | |
| 2. | Experime Brain Tute | ntal approach to studying the working human brain and body. How to or. How to use the BESA dipole simulator. | use Brain Voyager |
| 3. | | ntal approach to processing sensory information in the brain using pyt | hon. |
| 4. | | and practice: Written materials needed to get a CogNeuro research stu | |
| | | ff the ground: Runsheets, SOPs, questionnaires, informed consent forr | |
| 5. | | on to EEG recordings. Theory, physiology, practical aspects of recordined brain potentials. | ng and analysing |
| 6. | EEG anal | ysis: How to get from the raw recording to specific brain waves. An ex- | ample analysis. |
| 7. | - | temming operation in python using NLTK | |
| 8. | Perform l | emmatization in python using NLTK | |
| 9. | Perform p | parts of speech tagging in python using NLTK | |
| 10. | - | nd running Robot programs – Activity of PICK and Place of an object | |
| 11. | Make sim | ulation model using Rockwell ARENA 11.0 to show the functions / proving work cell. | |
| 12. | | n modelling of four machine system using Rockwell ARENA 11.0. | |
| 13. | Build an A | Artificial Neural Network by implementing the Backpropagation algorithm | thm and test the same |
| | using appr | ropriate data sets. | |





| 14. | Evaluating ML algorithm with bala | anced and unb | alanced | datasets Comparison of Machine Learning |
|------|------------------------------------|------------------|-----------|--|
| | algorithms. | | | |
| 15. | Apply EM algorithm to cluster a se | et of data store | d in a .C | SV file. Use the same data, set for clustering |
| | using k- Means algorithm. Compar | e the results o | f these t | wo algorithms and comment on the quality |
| | of clustering. You can add Java/P | ython ML libi | rary clas | ses/API in the program. |
| | | | | Total Laboratory Hours 30 hours |
| Mod | e of Assessment: Assessment/Mi | dterm Exam | /FAT | · · · |
| Reco | ommended by Board of Studies | 22-05-2021 | | |
| | | | Data | 15 07 0001 |
| App | roved by Academic Council | No. 62 | Date | 15-07-2021 |





| CDC 4001 | Course title | L | Τ | Р | J | С |
|--|---|---------------------------------------|--------------------------------|---------------------------------------|--|--|
| CBS4001 | Robotics and Embedded Systems | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | S | • | | versi | on |
| | | | | v. 1. | 0 | |
| Course Objectives: | | | | | | |
| | cepts of embedded system design, peripherals and its modelin | ng | | | | |
| = | nce of RTOS and illustrate various real world examples | | | | | |
| 3. To introduce basics of | f robot, mathematics and its applications | | | | | |
| Expected Course Out | come: | | | | | |
| - | ge about embedded system design and basics of robot. | | | | | |
| • | nd the internal architecture and interfacing of different p | eripł | neral | dev | ices | wit |
| | d the modelling of hardware software requirements and their | trad | e-off | s | | |
| • | its issues for real time system design | uu | 0 011 | 5. | | |
| | real world case studies | | | | | |
| | component or a product applying all the relevant standa | ards | and | with | real | isti |
| constraints | component of a product apprying an the relevant stand | ai G 5 | una | vv i til | i ieu | |
| Module:1 Intro | duction to Embedded System | | | | 5 h | our |
| | General computing systems, History of Embedded systems, | Dur | nose | ofF | | |
| - | r and Microcontroller, Hardware architecture of the real time | - | - | OI L | | auco |
| J / 1 | , , | 5 | | | | |
| | es and Communication Buses | | | | 6 h | our |
| | | | | | | |
| I/O types, serial and par | allel communication devices, wireless communication devices | | | | | |
| I/O types, serial and par devices, watchdog tim | er, real time clock, serial bus communication protocols, pa | arall | el co | mm | unica | |
| I/O types, serial and par devices, watchdog tim | | arall | el co | mm | unica | |
| I/O types, serial and par devices, watchdog tim network using ISA, PC | er, real time clock, serial bus communication protocols, particular of the series of t | arall | el co | mm | unica ooth. | ation |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US | el co B, B | omm lueto | unica both. 6 h | ntion our |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US ing 1 | el co B, B Lang | uage | unica ooth. 6 h e (UI | ntion our ML) |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta Hardware Software trac | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US ing 1 | el co B, B Lang | uage | unica ooth. 6 h e (UI | ntion our ML) |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US ing 1 | el co B, B Lang | uage | unica ooth. 6 h e (UI | ntion our ML) |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta Hardware Software trac system. Module:4 Real | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US ing l odel | el cc B, B Lang for r | omm lueto uage nulti | unica ooth. 6 h e (UI proce 7 h | our our our |
| I/O types, serial and part devices, watchdog tim network using ISA, PCModule:3Progr Oncepts, Fundamenta Hardware Software track system.Module:4Real Derating system base | er, real time clock, serial bus communication protocols, particular protocols, particular protocols and the protocols of the protocols of the protocols of the protocols of the programming model, make the programming model, make the programming model, make the programming model protocols of the programming model protocols of the | arall , US ing l odel | el cc B, B Lang for r | omm lueto uage nulti | unica ooth. 6 h e (UI proce 7 h | our ML) esso |
| I/O types, serial and part devices, watchdog tim network using ISA, PCModule:3Progr Oncepts, Fundamenta Hardware Software track system.Module:4Real Derating system base | er, real time clock, serial bus communication protocols, particular of the protocols of the | arall , US ing l odel | el cc B, B Lang for r | omm lueto uage nulti | unica ooth. 6 h e (UI proce 7 h | our ML) esso |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta Hardware Software trac system. Module:4 Real Operating system bas communication, task sy | er, real time clock, serial bus communication protocols, particular protocols, particular protocols and the protocols of the protocols of the protocols of the protocols of the programming model, make the programming model, make the programming model, make the programming model protocols of the programming model protocols of the | arall , US ing l odel | el cc B, B Lang for r | omm lueto uage nulti | unica ooth. 6 h e (UI proce 7 h ng, | our ML) esso our task |
| I/O types, serial and part devices, watchdog tim network using ISA, PCModule:3ProgrConcepts, Fundamenta Hardware Software tract system.Module:4Real Derating system bas communication, task syModule:5Example | er, real time clock, serial bus communication protocols, particular protocols, particular protocols and the system network protocols and Modelling and the software co-design, Unified Modelling and the software co-design, Unified Modelling and the software programming model, model programming model, model protocols, particular pr | arall , US ing l odel d n | el co B, B Lang for r | omm lueto uage nulti aski | unica ooth. 6 h e (UI proce 7 h ng, 7 h | our our ML) esso our task |
| I/O types, serial and part devices, watchdog tim network using ISA, PCModule:3ProgrConcepts, Fundamenta Hardware Software tract system.Module:4Real Operating system bas communication, task syModule:5Exam Mobile phones, RFID | er, real time clock, serial bus communication protocols, particular protocols, particular protocols and the protocols of the protocols of the protocols of the protocol protocols of the programming model, model protocols of the protocol p | arall , US ing l odel d n | el co B, B Lang for r | omm lueto uage nulti aski | unica ooth. 6 h e (UI proce 7 h ng, 7 h | our our ML) esso our task |
| I/O types, serial and par devices, watchdog tim network using ISA, PC Module:3 Progr Concepts, Fundamenta Hardware Software trac system. Module:4 Real Operating system bas communication, task sy Module:5 Exam Mobile phones, RFID Popular microcontroller | er, real time clock, serial bus communication protocols, part, PCT-X, and Internet embedded system network protocols cam Modelling I issues in Hardware software co-design, Unified Modelling I issues in Hardware soft | arall , US ing l odel d n | el co B, B Lang for r | omm lueto uage nulti aski | unica ooth. 6h e (UI proce 7h ng, 7h rface | our our our our task |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Mo | odule:7 | Kinematics and Algorit | hms | | | 7 hours |
|------------------|----------------|---|------------------------------|------------------|--------------------|------------------|
| Ki | nematics of | serial robots, Kinematics of | parallel robots, | Motion planni | ing and control, S | Sensing distance |
| and | l direction, I | Line Following Algorithms, I | Feedback System | ns, Other topics | s on advance robo | otic techniques |
| | | | | | | |
| | odule:8 | Contemporary issues | | | | 2 hours |
| Gu | est lecture b | y Industry Experts or R&D | organization | | | |
| | | | | Total Lectur | e hours: | 45 hours |
| Те | xt Book(s) | | | Total Lectur | e nours. | |
| 1. | | V, "Introduction to Embedd | ded Systems", 2 ^r | d Edition, Mc | Graw Hill, 2017 | |
| 2. | | Ghosal, "Robotics: Fundame | | | | Press, 2006. |
| Re | ference Bo | | 1 | _ | | |
| 1. | | as, "Embedded Systems: A | n Integrated Ap | proach",1st eo | lition, Pearson E | Education India, |
| | 2012. | | | | | |
| 2. | 5 | nal, "Embedded Systems- A | rchitecture, Pro | gramming and | l Design", 3rd E | dition, McGraw |
| | | cation, 2017. | | | | |
| M | ode of Eval | luation: CAT / Digital As | signment / Qui | z / FAT / Lal |) | |
| τ. | t of Challes | nging Experiments (Indica | ativa) | | | |
| 1. | | Operations using 8051 | auve) | | | |
| $\frac{1.}{2.}$ | | g ADC and DAC | | | | |
| 2. 3. | • | g LED and PWM | | | | |
| 3. 4. | • | g real time clock and serial po | out | | | |
| 4. 5. | Ū. | g keyboard and LCD | Л | | | |
| 5. 6. | Flashing L | • | | | | |
| | e | | | | | |
| 7. | | g stepper motor and tempera | | | | |
| | • | obotic arm and its configurat obotic end effectors | 10115 | | | |
| | | ODOLIC AND ATTACTORS | | | | |
| 8. 9. | Study of re | | | Total Laborra | own Horma | 20 h |
| 9. | | | | Total Laborat | tory Hours | 30 hours |
| 9. M o | ode of Asses | ssment: Assessments/ Mi d by Board of Studies | | | tory Hours | 30 hours |



| | de | | | T 1 | P | J | C |
|--|--|---|-----------------------|--------|-------|--|---|
| CBS4002 | 2 | Cryptology and Analysis | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | | NIL | Sy | llab | us v | versi | ion |
| | | | | V | 7.1.0 |) | |
| Course Objecti | | | | | | | |
| | | g concepts of cryptography and algorithms | | | | | |
| 2. To defend the | e security | y attacks on information systems using secure algorithms and a | Auth | nentic | catic | on | |
| process | | | | | | | |
| 3. To categorize | and anal | yze the key concepts of cryptanalysis and quantum cryptograp | ohy | | | | |
| Expected Cour | rse Outo | come: | | | | | |
| 1. Infer the need | l of secu | rity to introduced strong cryptosystems. | | | | | |
| 2. Analyze the c | ryptogra | aphic algorithms for information security. | | | | | |
| 3. Identify the a | uthentic | ation schemes for membership authorization. | | | | | |
| 4. Identify the re | equireme | ents for secure communication and challenges related to the se | ecure | e app | licat | tions | 5 |
| • | - | e need of quantum cryptographic solutions. | | | | | |
| 5 | 5 | | | | | | |
| Module:1 | Introd | luction to Cryptography | | | | 6 h | ou |
| Introduction to | | ography: Elementary number theory, Pseudo-random bit gen | enera | tion, | Ele | emei | nta |
| cryptosystems. | vi | | | , | | | |
| ••••• | ervices: | confidentiality, integrity, availability, non-repudiation, privacy | X 7 | | | | |
| | | | v | | | | |
| • | | connectinativy, integrity, availability, non repadiation, privacy | y | | | | |
| | | | y | | | 8 h | ou |
| Module:2 | Basic | Symmetric Key Cryptosystems | - | som | ne pi | 8 h rom | |
| Module:2 Stream Cipher: | Basic Basic I | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples v | - | som | ne pi | | |
| Module:2 Stream Cipher: | Basic Basic I | Symmetric Key Cryptosystems | - | som | ne pi | | |
| Module:2 Stream Cipher: | Basic Basic I Basic I Brain fam | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC | - | som | ne pi | | ine |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 | Basic E Basic I Basic I Brain fam | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples v | - | som | ne pi | rom | ine |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 | Basic E Basic I Basic I Brain fam | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems | - | som | ne pr | rom | ine |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 | Basic I Basic I Basic I Brain fam Advar DES, AF | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems | - | som | ie pi | rom | ine ou |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 | Basic I Basic I Brain farr Advar DES, AF | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC need Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems | - | som | ie pi | rom 5 h | ine ou |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi | Basic I Basic I brain fam Advar DES, AF Public ital signa | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC need Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems htures | - | som | ne pi | rom 5 h 5 h | ine |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 | Basic I Basic I Basic I Grain far Advar DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EX Key Cryptosystems atures Security Applications | with | | | rom 5 h 5 h 6 h | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 | Basic I Basic I Basic I Grain far Advar DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples w hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC need Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems htures | with | | | rom 5 h 5 h 6 h | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comn | Basic I Basic I Basic I Grain far Advar DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF DES, AF | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples whily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EX Key Cryptosystems intures Security Applications nonymous cash, micro-payments), Key management, Zero-know | with | | | 5 h 5 h 6 h | ine iou iou s |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comn Module:6 | Basic Basic Basic arain fam Advar DES, AB Public ital signa Basic nerce (an Advan | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while hily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EX Key Cryptosystems atures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications | with | edge j | prot | rom 5 h 5 h 6 h | ine iou iou s |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comn Module:6 | Basic Basic Basic arain fam Advar DES, AB Public ital signa Basic nerce (an Advan | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples whily, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EX Key Cryptosystems intures Security Applications nonymous cash, micro-payments), Key management, Zero-know | with | edge j | prot | 5 h 5 h 6 h | ine ou ou |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comn Module:6 Cryptology in C | Basic Basic Basic arain fam Advar DES, AE Public ital signal Basic nerce (an Advan Contact T | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems netures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis | with | edge j | prot | 5 h 5 h 6 h 0col | ine iou iou s iou |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 | Basic I Basic I Basic I Grain far Advar DES, AF DES, AF DES, AF DES, AF DES, AF Contact T Contact T Post-Q | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples will hilly, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EXey Cryptosystems intures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography | with with cowle cowle | edge j | prot | rom 5 h 5 h 6 h ocol 5 h 8 h | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 Post-Quantum C | Basic Basic Frain fam Advar DES, AE Public ital signa Basic nerce (an Advan Contact T Post-Q Cryptogra | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems atures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography aphy, Public-Key Post-Quantum Cryptographic Algorithms, S | with with cowle cowle | edge j | prot | rom 5 h 5 h 6 h ocol 5 h 8 h | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 | Basic Basic Frain fam Advar DES, AE Public ital signa Basic nerce (an Advan Contact T Post-Q Cryptogra | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication c Key Cryptosystems atures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography aphy, Public-Key Post-Quantum Cryptographic Algorithms, S | with with cowle cowle | edge j | prot | rom 5 h 5 h 6 h ocol 5 h 8 h | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: I Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 Post-Quantum C Signatures, Thre | Basic Basic Io Frain fam Advar DES, AE Public ital signa Basic 3 nerce (an Advan Contact 7 Post-Q Shold Constant | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples willy, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EXey Cryptosystems attures Security Applications nonymous cash, micro-payments), Key management, Zero-kno meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography aphy, Public-Key Post-Quantum Cryptographic Algorithms, S ryptography | with with cowle cowle | edge j | prot | 5 h 6 h ocol 5 h 8 h -Bas | ine ine iou iou sed |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 Post-Quantum C Signatures, Thre Module:8 | Basic I Basic I Grain fam Advar DES, AF Public ital signa Basic I nerce (an Advan Contact T Post-Q Cryptogra eshold Ch | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples while, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EXey Cryptosystems attures Security Applications nonymous cash, micro-payments), Key management, Zero-know meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography aphy, Public-Key Post-Quantum Cryptographic Algorithms, S ryptography emporary issues | with with cowle cowle | edge j | prot | 5 h 6 h ocol 5 h 8 h -Bas | |
| Module:2 Stream Cipher: ciphers: A5/1, G Module:3 Block Ciphers: 1 Module:4 RSA, ECC; Digi Module:5 Electronic comm Module:6 Cryptology in C Module:7 Post-Quantum C Signatures, Thre Module:8 | Basic I Basic I Grain fam Advar DES, AF Public ital signa Basic I nerce (an Advan Contact T Post-Q Cryptogra eshold Ch | Symmetric Key Cryptosystems deas, Hardware and Software Implementations, Examples willy, RC4, Salsa and ChaCha, HC128, SNOW family, ZUC meed Symmetric Key Cryptosystems ES, Modes of Operation; Hash Functions; Authentication EXey Cryptosystems attures Security Applications nonymous cash, micro-payments), Key management, Zero-kno meed Security Applications Fracing Applications, Issues related to Quantum Cryptanalysis Quantum Cryptography aphy, Public-Key Post-Quantum Cryptographic Algorithms, S ryptography | with with owle | edge j | prot. | 5 h 6 h ocol 5 h 8 h -Bas | ine iou iou is iou is iou is iou is iou |



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| Text Book(s) | | | | | | | |
|---|---|--|--|--|--|--|--|
| 1. | W. Stallings, Cryptography and Network Security: Principles and Practice, 7th Edition, Pearson, 2017. | | | | | | |
| 2. | A. J. Menezes, P. C. van Oorschot, and S. A. Vanstone, Handbook of Applied Cryptography., CRC | | | | | | |
| | Press, 2011 | | | | | | |
| Re | ference Books | | | | | | |
| 1. | C. S. Mukherjee, D. Roy, S. Maitra, Design & Cryptanalysis of ZUC - A Stream Cipher in Mobile | | | | | | |
| | Telephony. Springer, 2020 | | | | | | |
| 2. | D. R. Stinson, Cryptography, Theory and Practice. CRC Press, 2014. | | | | | | |
| Mode of Evaluation: CAT / Assignment / Quiz / FAT | | | | | | | |
| Re | commended by Board of Studies 29-01-2021 | | | | | | |
| Ap | proved by Academic Council No. 61 Date 18-02-2021 | | | | | | |





| Course Code | Course Title | L | Τ | Р | J | С |
|------------------------------------|---|--------|-------|-------|------------|-------|
| CBS4003 | Quantum Computation & Quantum Information | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | NIL | S | yllal | ous v | | on |
| Correct Objections | | | | v. 1. | 0 | |
| Course Objectives | e fundamental concepts on quantum computing | | | | | |
| | | | | | | |
| | lo computation using quantum algorithms e information in various modern-day applications | | | | | |
| 5. To process secure | e mormation in various modern-day applications | | | | | |
| Expected Course | Outcome: | | | | | |
| | asic concepts on quantum computing | | | | | |
| | nt quantum algorithms for performing computations on quantum | m cor | mput | ers | | |
| 3. Generate perfectl | y unpredictable random numbers to ensure the strongest level of | of enc | rypti | on | | |
| 4. Ensure secure con | mmunication using quantum key distribution method | | | | | |
| 5. Evaluate and stan | dardize quantum-resistant public-key cryptographic algorithms | | | | | |
| | n computations to solve simple problems | | | | | |
| | | | | | | |
| | ntroduction to Quantum Information | ~ | | | | ours |
| = | Measurements, Quantum Entanglement: Quantum Teleportation | on, Si | uper | -dens | se co | ding, |
| CHSH Game, Quan | tum gates and circuits. | | | | | |
| Module:2 O | uantum Algorithms Basic | | | | 8 h | ours |
| | non, Grover, Shor, Implication of Grover's and Simon's algor | rithm | s tov | vards | | |
| symmetric key cryp | | | | | | |
| | - | | | | | |
| | uantum Algorithms Advanced | | | | | ours |
| - | r's algorithm towards factorization and Discrete Logarithm ba | ised c | lassi | cal p | ubli | c key |
| cryptosystems | | | | | | |
| Module:4 O | uantum True Random Number Generators (QTRNG): | | | | 7 h | ours |
| | ndom Number Generators (QTRNG): Detailed design and | issues | s of | quar | | |
| Commercial produc | ts and applications | | | | | |
| 1 | | | | | | |
| | asic Quantum key distribution | | | | 4 h | ours |
| Quantum key distri | bution (QKD): BB84, Ekert, Semi-Quantum QKD protocols | | | | | |
| Module:6 A | dvanced Quantum key distribution | | | | 4 h | ours |
| | Quantum QKD protocols, Issues of Device Independence, Con | merc | ial n | rodu | | Juis |
| | | | ľ | | - | |
| | troductory topics in Post-Quantum Cryptography | | | | | ours |
| | | | two | aiml | ora | from |
| | rc.nist.gov/projects/post-quantum-cryptography. May discuss | s any | two | cipi | 1015 | |
| Refer to https://csi this list. | rc.nist.gov/projects/post-quantum-cryptography. May discuss | | two | cipi | 1015 | |
| this list. | rc.nist.gov/projects/post-quantum-cryptography. May discuss ontemporary Issues | | two | | | ours |
| this list. Module:8 C | | | | | 2 h | |





B. Tech Computer Science and Engineering and Business Systems

| Te | ext Book(s) |
|-----|--|
| 1. | M. A. Nielsen and I. L. Chuang, Quantum Computation and Quantum Information, Cambrid |
| | University Press. 2010. |
| 2. | Chris Bernhardt, Quantum Computing for Everyone, MIT Press 2019. |
| Re | eference Books |
| 1. | Presskil Lecture notes: Available online: http://www.theory.caltech.edu/~preskill/ph229/ |
| 2. | NIST Post Quantum Cryptography, Available online: https://csrc.nist.gov/projects/post-quantu |
| | cryptography/ |
| Mo | lode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar |
| | |
| Lis | ist of Challenging Experiments (Indicative) |
| 1. | |
| 2. | |
| 3. | |
| 4. | . Implementation of quantum algorithms - Deutsch–Jozsa problem, Simon's algorithm and Shor's algorithm |
| 5. | Implement classical logics using quantum circuits |
| 6. | Program to implement Quantum counting |
| 7. | Program for Quantum optimization algorithms |
| 8. | |
| 9. | |
| | Total Laboratory Hours 30 ho |
| | Iode of Assessment: Assessments/ Mid Term Lab/ FAT / Project |
| | ecommended by Board of Studies 29-01-2021 |
| Ap | pproved by Academic Council No. 61 Date 18-02-2021 |



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CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | Т | P | J | C |
|--|---|----------|----------|---------|--------------|--------|
| CBS4004 | Image Processing and Pattern Recognition | 3 | 0 | 0 | 4 | 4 |
| Pre-requisite | NIL | | Syllab | | rsion | |
| ~ | | | | v. 1.0 | | |
| Course Objectives: | | • . • | | | | |
| | amental concepts of image processing and pattern recogn | | | | | |
| | bus image processing steps and their applications in real ti | | | | | |
| | nts to incorporate pattern recognition in image processin | g and | its imp | ortan | ce 1n | rea |
| time applications. | | | | | | |
| Expected Course Or | utcomo | | | | | |
| | concepts of image processing with mathematical interpret | ation | | | | |
| | ge of different image enhancement, and image registration | | iques | | | |
| | rious image segmentation and morphological operations | | - | of obje | ects | |
| | ts of color image processing. | or par | | 1 00jt | | |
| | amental concepts of various feature extraction techniqu | es and | recog | nize f | he im | າລຸດເ |
| scene from image fea | - | co una | 10005 | 11120 1 | | iugt |
| - | ment image processing techniques for various real-time a | oplicati | ions su | ch as | indus | strv |
| medicine and defense. | | pricat | | en us | maac | , ci y |
| | | | | | | |
| Module:1 Digit | tal Image Fundamentals | | | | 8 h a | our |
| Introduction: Image p | rocessing systems and its applications. Basic image file for | rmats | | | | |
| Image formation: G | eometric and photometric models; Digitization - sam | pling, | quanti | zatio | n; Im | nage |
| definition and its repr | resentation, neighbourhood metrics. | | | | | |
| | | | | | | |
| | ge Enhancement | | | | 6 ho | |
| | st stretching, histogram specification, local contrast enha | | | | ng, li | nea |
| and order statistic filte | ering, sharpening, spatial convolution, Gaussian smoothin | g, DoC | i, LoG | • | | |
| Module:3 Imag | to registration | | | | <u> </u> | |
| , i | ge registration -modal/multimodal image registration; Global/local r | anistra | tion: 7 | Franci | 6 ho | |
| | r registration; Intensity/pixel interpolation. | egisua | uon, 1 | 1141151 | lonn | anc |
| | | | | | | |
| Module:4 Mor | phological processing | | | | 5 ho | our |
| | ering Basics: Dilation and Erosion Operators, Openi | ng an | d Clos | ing c | | |
| • 0 | s Skeletons-Thinning and Thickening boundaries, Convex | U | | 0 | - | |
| | | | 1 | | | |
| Module:5 Imag | ge Segmentation | | | | 7 ho | our |
| Segmentation: Pixel | l classification; Grey level thresholding, global/local th | nresho | lding; | Optin | num | |
| thresholding - Bayes | s analysis, Otsu method; Derivative based edge detec | tion of | perator | s, ed | ge | |
| detection/linking, Can | ny edge detector; Region growing, split/merge techniques | 5. | | | | |
| | | | | | | |
| Module:6 Colo | r Image Processing | | | | 5 ho | ours |
| | | | | - | | 0114 |
| Fundamentals of diff Enhancement; Segment | erent colour models - RGB, CMY, HSI, YCbCr, Lab; F | false co | olour;] | Pseud | lo col | our |





| Mo | dule:7 | Image/Object features en | xtraction | | | 6 hours | |
|-----|---|--------------------------------|----------------------------------|-------------|--------------------------------------|---------------|--|
| Tex | tural featur | es - gray level co-occurrence | matrix; Moments; | Connected | l component analysis; | Convex hull; | |
| Dis | tance transf | orm, medial axis transform, | skeletonization/thi | nning, shaj | pe properties | | |
| | | | | | | | |
| | dule:8 | Contemporary issues | | | | 2 hours | |
| Gue | est lecture b | y Industry Experts or R&D of | organization | | | | |
| | | | | Tota | al Lecture hours: | 45 hours | |
| Tex | kt Book(s) | · | | | | | |
| 1. | Rafael C. | Gonzalez and Richard E. Wo | ods, Digital Image | Processing | g, 4 th Edition, Pearson, | , 2018. | |
| 2. | William K | . Pratt, Digital Image Process | ing, 4 th Edition, Jo | hn Wiley, 2 | 2007. | | |
| Ref | ference Bo | oks | | | | | |
| 1. | Maria Pet | rou and Panagiota Bosdogia | nni, "Image Proce | essing: The | e Fundamentals", 2nd | edition, John | |
| | Wiley, 201 | 0 | | | | | |
| 2. | 2. Kenneth R. Castleman, "Digital Image Processing", 2 nd Edition, Pearson, 2010 | | | | | | |
| Mo | de of Eval | uation: CAT / Assignmer | nt / Quiz / FAT / | Project / S | Seminar | | |
| Rec | commende | d by Board of Studies | 29-01-2021 | | | | |
| Ap | proved by . | Academic Council | No. 61 | Date | 18-02-2021 | | |





| Course (| | Course Title | L | Т | P | J | С |
|---|---|---|--|--|--|--|---|
| CBS40 | | Enterprise systems | 3 | 0 | 2 | 0 | 4 |
| Pre-requisit | e | NIL | | Sylla | bus ve | ersior | n |
| | | | | | v.1.0 | | |
| Course Obje | | | | | | | |
| | | ssential concepts of ERP involved in business processes | | | | | |
| - | | the design and implementation of ERP architecture | | • , | | | |
| 3. To familia | arize with | various tools and technologies for developing ERP for l | arge p | roject | | | |
| Expected Co | ourse Ou | tcome: | | | | | |
| 1. Ability to | design ar | nd deploy simple web applications using MVC architectur | re | | | | |
| 2. Evaluate | SOA and | ERP models | | | | | |
| 3. Ability to | design ar | nd implement CRM models | | | | | |
| 4. Implement | t interact | ive network and application | | | | | |
| 5. Evaluate | organizati | onal opportunities and challenges in the design system | | | | | |
| 6. Ability to | develop | model for ERP for large projects | | | | | |
| Module:1 | Mode | l - View - Control (MVC)architecture | | | | 61 | nour |
| | | | • | | <u> </u> | | |
| | | MVC method of software development in a 3-tier env | vironi | nent - | Contr | 01 (N | AVC. |
| development | in a 3-fiei | r environment | | | | | |
| 1 | | | | | | | |
| Module:2 | | | | | | 61 | hour |
| Module:2 | Tools | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav | vaScri | pt, Aja | ax and | | hour |
| Module:2 Tools and Tea | Tools | and Technologies | vaScri | pt, Aja | ax and | | hour |
| Module:2 Tools and Teo Overview of 3 | Tools chnologie SAP and | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jay Oracle Applications | vaScri | pt, Aja | ax and | | |
| Module:2 Tools and Teo Overview of 3 Module:3 | Tools Chnologie SAP and C | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules | | | | 81 | hour |
| Module:2 Tools and Tea Overview of S Module:3 Service Ories | Tools chnologie SAP and ERP Anted Arch | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jay Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps | sulatio | on - In | ter-op | 8 l erabi | hour ility - |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re | Tools chnologie SAP and C ERP anted Arch esource Pl | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jay Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H | sulatio | on - In | ter-op | 8 l erabi | hour ility |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma | Tools Chnologie SAP and C ERP Inted Arch assource Pl nagement | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules | sulatio | on - In | ter-op | 81 erabi ance | hour ility , HR |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 | Tools chnologie SAP and C ERP Anted Arch esource Pl nagement ERP | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jay Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic F , Investment - Examples of Domain Specific Modules Technologies | sulatio | on - In Aodule | ter-op es: Fin | 81 erabi ance 71 | hours ility - , HR |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro | Tools Chnologie SAP and C ERP A nted Arch esource Pl nagement ERP ccess Reer | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy | sulatio ERP N | on - In Iodule | ter-op es: Fin | 81 erabi ance 71 Elect | hour ility , HR hour |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro | Tools Chnologie SAP and C ERP A nted Arch esource Pl nagement ERP ccess Reer | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jay Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic F , Investment - Examples of Domain Specific Modules Technologies | sulatio ERP N | on - In Iodule | ter-op es: Fin | 81 erabi ance 71 Elect | hour ility , HR hour |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro | Tools chnologie SAP and C ERP A nted Arch esource Pl nagement ERP C cess Reer ge - Custo | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy | sulatio ERP N | on - In Iodule | ter-op es: Fin | 81 erabi ance 71 Elect at (SR | hour ility , HR hour tronic RM) |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 | Tools chnologie SAP and C ERP Anted Arch assource Pl nagement ERP cess Reen ge - Custo ERP 1 | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation | sulatio ERP N tical l nship | on - In Iodula Proces Mana | ter-op es: Fin sing - gemen | 81 erabi ance 71 Elect t (SR 61 | hour ility , HR hour tronic RM) |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of | Tools chnologie SAP and C ERP A nted Arch esource Pl nagement ERP C cess Reen ge - Custo ERP I MPLS - V | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relatio Networking & Security | sulation ERP M tical l nship | on - In Iodule Proces Mana ring a | ter-op es: Fin sing - gemen nd enf | 81 erabi ance 71 Elect at (SR 61 orcer | hour ility , HR hour tronic RM) hour nent |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of 5 of policies - E | Tools chnologie SAP and C ERP 2 nted Arch esource Pl nagement ERP 2 cess Reen ge - Custo ERP 1 MPLS - V CRP Secu | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network n | tical l nship | on - In Aodula Proces Mana ring a – Role | ter-op es: Fin sing - gemen nd enf | 81 erabi ance 71 Elect at (SR 61 orcer | hour ility , HR hour tronic RM) hour nent |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of 1 of policies - E on -Directory | Tools chnologie SAP and C ERP Anted Arch esource Pl nagement ERP C cess Reen ge - Custo ERP Secur Servers - | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network n rity Issues – Authentication – Authorisation - Access co - Audit trails - Digital signatures – Encryption - review of | tical l nship | on - In Aodula Proces Mana ring a – Role | ter-op es: Fin sing - gemen nd enf | 81 erabi ance 71 Elect t (SR 61 orcer gle-s | hour ility , HR hour tronic RM) hour nent sign- |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of of policies - E on -Directory Module:6 | Tools chnologie SAP and 0 ERP 2 nted Arch esource Pl nagement ERP 1 cess Reer ge - Custo ERP 1 MPLS - V CRP Secur servers - Soft | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network n rity Issues – Authentication – Authorisation - Access co - Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems | tical l nship | n - In Iodule Proces Mana ring a: - Role Sec - S | ter-op es: Fin ssing - gemen nd enfe es - sin SL | 81 erabi ance 71 Elect t (SR 61 orcer gle-s 51 | hour ility , HR hour tronic RM) hour hour |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of of policies - E on -Directory Module:6 Software: Ac | Tools Chnologie SAP and C ERP And C ERP And C Teled Arch agement ERP C Cess Reen cess Reen cess Reen cess Reen CRP Secure Servers - Soft quisition | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network n rity Issues – Authentication – Authorisation - Access co - Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems Process – Tendering - conditions of contract - Comme | sulation ERP M tical l nship nonito ntrol of IPS ercial | on - In Iodule Proces Mana ring a - Role Sec - S | ter-op es: Fin sing - gemen nd enf es - sin SL | 81 erabi ance 71 Elect tt (SR 61 orcer gle-s 51 soft | hour ility , HR hour tronic (M) hour nent sign- hour ware |
| Module:2 Tools and Teo Overview of 3 Module:3 Service Orien Enterprise Re Materials Ma Module:4 Business Pro Data Exchang Module:5 Overview of of policies - E on -Directory Module:6 Software: Ac (COTS) Imp | Tools chnologie SAP and 0 ERP 2 nted Arch esource Pl nagement ERP 1 cess Reer ge - Custo ERP 1 MPLS - V CRP Secur servers - Soft quisition ementati | and Technologies s: - Microsoft .NET framework, PHP, Ruby on Rails, Jav Oracle Applications Architecture and Generic Modules hitecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic H , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy mer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network n rity Issues – Authentication – Authorisation - Access co - Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems | sulation ERP M tical l nship nonito ntrol of IPS ercial | on - In Iodule Proces Mana ring a - Role Sec - S | ter-op es: Fin sing - gemen nd enf es - sin SL | 81 erabi ance 71 Elect tt (SR 61 orcer gle-s 51 soft | hours hours kronic M) hours sign- hours ware |



Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Mo | dule:7 | Hardware Architectures | for Enterprise Sy | stems | | 5 hours |
|-----------------|---------------|--|---------------------|--------------|----------------------|---------------|
| Harc | lware: Serv | ers – Storage area networks - | Storage units - Bac | k-up strate | gies - Local Area N | letwork |
| | | gies and products - Data Cer | | | | |
| | | | | | | |
| Moo | dule:8 | Contemporary issues | | | | 2 hours |
| Gue | est lecture b | y Industry Experts or R&D of | organization | | | |
| | | | | Total Le | ecture Hours: | 45 hours |
| Tex | tbook | | | | L | |
| 1. | Alexis Le | on, Enterprise Resource Plan | ning, 2020,4th Edit | ion, Tata N | IcGraw Hill. | |
| Ref | erence Boo | oks | | | | |
| 1. | Kurbel, K | L. E., Enterprise Resource Pla | nning and Supply | Chain Man | agement, 2016, Spr | inger. |
| 2. | | K, Sanjay M, Anbuudayas | 0 11 1 | | 5 | 0 |
| | | ntals of Design and Impleme | , | | | |
| Mo | | uation: CAT / Assignmen | · · · 1 | U | minor | |
| 10100 | ue of Eval | uation: CAT / Assignmen | | Tuject / S | emmai | |
| Tint | ef Chelles | | 49) | | | |
| 1. | | nging Experiments (Indica an ASP.NET MVC web appl | , | | | |
| 1. 2. | Ų | he client/server architecture | 1 0 | y to use the | usarintarfaca | |
| <u>2.</u> 3. | 1 | stomer, material master data. | | | | |
| <u> </u> | | nodel of customer relationshi | | | | for catalogue |
| т. | and onlin | | ip management and | i ousiness i | interingence systems | for editiogue |
| 5. | | nodel of Supplier Relationship | ip Management for | · Healthcare | e system | |
| 6. | | e and test a VPN connection | 1 0 | | | |
| 7. | | configuration | 1 | 1 | | |
| 8. | COTS co | nfiguration and implementati | on | | | |
| 9. | | E tools to aid ERP Software | | - Case stud | dy | |
| 10. | Use CAS | E tools to aid ERP hardware | acquisition process | s - Case stu | dy | |
| | | | | | Laboratory Hou | rs: 30 hours |
| | | sments: Assessments/Mid | | | | |
| | | l by Board of Studies | 22-05-2021 | | | |
| | rovod by | Academic Council | No. 62 | Date | 15-07-2021 | |



B. Tech Computer Science and Engineering and Business Systems

UNIVERSITY CORE

(AY 2022- 2023)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)



| Sl. No. | Course Code | Course Title | Page No. |
|---------|--------------------|---|----------|
| 1. | CBS1002 | Object Oriented Programming | 104 |
| 2. | CBS1901 | Technical Answers for Real World Problems (TARP) | 106 |
| 3. | CBS1902 | Industrial Project | 107 |
| 4. | CBS1903 | Comprehensive Examination | 108 |
| 5. | CBS1904 | Capstone Project | 110 |
| 6. | CHY1701 | Engineering Chemistry | 111 |
| 7. | CSE1008 | Programming in C | 114 |
| 8. | ENG1013 | Business Communication and Value Science - I | 117 |
| 9. | ENG1014 | Business Communication and Value Science - II | 119 |
| 10. | ENG1017 | Business Communication and Value Science - III | 121 |
| 11. | ENG1018 | Business Communication and Value Science - IV | 123 |
| 12. | ENG1901 | Technical English - I | 125 |
| 13. | ENG1902 | Technical English - II | 128 |
| 14. | ENG1903 | Advanced Technical English | 131 |
| 15. | HUM1021 | Ethics and Values | 133 |
| 16. | MAT1017 | Probability and Statistics | 135 |
| 17. | MGT2001 | Introduction to Innovation, IP Management and Entrepreneurship | 137 |
| 18. | PHY1005 | Modern Physics | 139 |
| 19. | FLC4097 | Foreign Language Course Basket | 141 |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | Т | Р | J | (|
|---|---|--|---|---|---|----------------------------------|
| CBS1002 | Object Oriented Programming | 3 | 0 | 2 | 0 | |
| re-requisite | NIL | Syl | labus | s ver | sion | |
| | | | v. | 1.0 | | |
| Course Objectives: | | | | | | |
| - | c characteristics of OOP through C++. | | | | | |
| - | on various kinds of overloading and inheritance. | | | | | |
| 3. To introduce poi | nters and file handling in C++ together with exception handlin | g mech | nanisr | n. | | |
| Expected Course O | utcome: | | | | | |
| After completion of the | his course, students will be able to: | | | | | |
| 1. Realize the need | and features of OOP and idealize how C++ differs from C. | | | | | |
| 2. Infer knowledge | on various types of overloading. | | | | | |
| | inheritance while proposing solution for the given problem. | | | | | |
| | and effective memory management. | | | | | |
| | tion of pointers in virtual functions. | | | | | |
| •• | handling in C++ and handle exceptions. | | | | | |
| | ained knowledge by applying the learned techniques to solve va | rious re | eal-w | orld | | |
| 7. Showcase the atta | | | | | | |
| | | | | | | |
| problems. | | | | | | |
| problems. | troduction | | | | 3 ho | ur |
| moblems. | troduction | | | | | |
| moblems. | troduction nted programming? Why do we need object oriented? Program | | | | | |
| problems. Module:1 Int What is object-orien object-oriented lang | troduction nted programming? Why do we need object oriented? Programuages. | | | icteri | stics | 0 |
| problems. Module:1 Int What is object-orien object-oriented lang Module:2 C+ | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics | nming | chara | octeri | | 0 |
| problems. Module:1 Int What is object-oriented object-oriented lang Module:2 C+ | troduction nted programming? Why do we need object oriented? Programuages. | nming | chara | octeri | stics | 0 |
| problems. Module:1 Int What is object-orien object-oriented lang Module:2 C+ Output using cout. I | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T | nming | chara | ons. | stics | 0) ur |
| problems. Module:1 Int What is object-oriented object-oriented lang Module:2 C+ Output using cout. I Module:3 Op | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: | nming ype cor | chara | ons. | stics 4 hou 7 hou | ur ur |
| problems. Module:1 Int What is object-orient object-oriented lang Module:2 C+ Output using cout. I Module:3 Op Overloading unary | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T | nming ype cor | chara | ons. | stics 4 hou 7 hou | ur ur |
| problems. Module:1 Int What is object-orient object-oriented lang Module:2 C+ Output using cout. I Module:3 Op Overloading unary overloading and cor | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. | nming ype cor | chara | ons. | 4 ho 7 ho oper | ur ur |
| problems. Module:1 Int What is object-oriented lang object-oriented lang Module:2 C+ Output using cout. Module:3 Op Overloading and correction overloading and correc | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. heritance | nming ype con | chara nversi tfalls | ons. | 4 ho 7 ho oper 8 ho | ur ur at |
| problems. Module:1 Int What is object-oriented lang object-oriented lang Module:2 C+ Output using cout Int Module:3 Op Overloading and correct or Module:4 Int | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. heritance ance. Derived class and based class. Derived class construct | nming ype cor ion, pi | chara nversi tfalls nemt | ons. of | 4 ho 7 ho oper 8 ho | ur ur at |
| Module:1 Int What is object-orient lang object-oriented lang Module:2 C+ Output using cout. Int Module:3 Op Overloading unary overloading and correct of inheritance in the F Int | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. heritance ance. Derived class and based class. Derived class construct English distance class, class hierarchies, inheritance and grap | nming ype con ton, pi | chara nversi tfalls nemb | ons. of oer fu | 4 ho 7 ho oper 8 ho | |
| problems. Module:1 Int What is object-orien object-oriented lang Module:2 C+ Output using cout. I Module:3 Op Overloading unary overloading and cor Module:4 Int Concept of in⊢eritt inheritance in the F | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. heritance ance. Derived class and based class. Derived class construct | nming ype con ton, pi | chara nversi tfalls nemb | ons. of oer fu | 4 ho 7 ho oper 8 ho | |
| Module:1 Int What is object-orien object-orien object-oriented lang Module:2 C+ Output using cout. Int Module:3 Op Overloading unary overloading unary overloading overloading and cor Int Module:4 Int Produce of inheritation private inheritation | troduction nted programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T perator overloading: y operations. Overloading binary operators, data converse nversion keywords. Explicit and Mutable. heritance ance. Derived class and based class. Derived class construct English distance class, class hierarchies, inheritance and grap | nming ype con ton, pi | chara nversi tfalls nemb | ons. of of per fu , put ent. | 4 ho 7 ho oper 8 ho | un at or an |
| Module:1 Int What is object-oriented lang object-oriented lang Module:2 C+ Output using cout. It Int Module:3 Op Overloading unary overloading and correct of inheritance in the Herita inheritance in the Herita inheritance in the Herita inheritance in the Herita inheritance inheritance, set of the set of t | troduction Intel programming? Why do we need object oriented? Programuages. ++ Programming Basics Directives, Input with cin, Type bool, The setw manipulator, T berator overloading: y operations. Overloading binary operators, data conversion keywords. Explicit and Mutable. heritance ance. Derived class and based class. Derived class construct English distance class, class hierarchies, inheritance and grap, aggregation: Classes within classes, inheritance and programming programmers. | nming ype con ion, pi ctors, r phics sl n devel | chara nversi tfalls nemb hapes lopme | ons. of oer fu , put ent. | 4 hor 7 hor oper 8 hor unctional olic a 7 hor | un un at un un un |
| problems. Module:1 Int What is object-oriented lang object-oriented lang Module:2 C+ Output using cout. Int Module:3 Op Overloading unary overloading and cor Module:4 Int Concept of in⊢eritz inheritance in the H private inheritance, Fo Module:5 Po | troduction Inter of the original sector of the s | nming ype con ion, pi ctors, r bhics sl n devel | chara nversi tfalls nemb hapes lopma | ons. of of oer fu , put ent. | 4 hor 7 hor oper 8 hor unctional olic a 7 hor poin | un at or an un te |
| Module:1 Int What is object-oriented lang object-oriented lang Module:2 C+ Output using cout. I Int Module:3 Op Overloading unary overloading and C-types string Int | Froduction Inted programming? Why do we need object oriented? Programuages. Intersectives, Input with cin, Type bool, The setw manipulator, T Directives, Input with cin, Type bool, The setw manipulator, T Director overloading: y operations. Overloading binary operators, data conversion keywords. Explicit and Mutable. Intersection Ance. Derived class and based class. Derived class construct English distance class, class hierarchies, inheritance and grap, aggregation: Classes within classes, inheritance and programmeters. The address of operator and pointer and arrays. Pointers. Pointers. | nming ype con ion, pi ctors, r bhics sl n devel ter and ts, deb | chara nversi tfalls nemb hapes lopmo | ons. of of oer fu , put ent. | 4 hor 7 hor oper 8 hor unctional olic a 7 hor poin | un at or an un te |



Γ



CURRICULUM (2022 - 2023)

| <u> </u> | | | | | |
|--------------------|------------------------------------|---------------------|-------------|------------------|-------------------|
| Module:6 | Streams And Files | | · · . | 1 11. | 8 hours |
| | ses, Stream Errors, Disk File I/ | | - | | 0 |
| | ction, overloading the extract | | operators, | memory as a | a stream object, |
| command lin | e arguments, and printer outpu | t. | | | |
| Module:7 | Generic Programming and | 1 Exceptions | | | 6 hours |
| Function tem | plates, Class templates, Exception | on handling techniq | ues. | | |
| | | | | | |
| Module:8 | Contemporary Issues | | | | 2 hours |
| Guest lecture | by Industry Experts or R&D or | rganization | | | |
| | | r | Fotal Lectu | are hours: | 45 hours |
| Text Book(s |) | | | | |
| 1. Debasi 2014. | sh Jana, "C++ and Object-Orien | nted Programming | Paradigm" | 'Third Edition | , PHIPublishers, |
| 2. R Raja | ram, "Object Oriented Progran | nming and C++", | Revised Ed | lition, New A | ge International, |
| 2007. | | - | | | - |
| Reference B | ooks | | | | |
| 1. Shah Y | i, Mh Thaker, "Programming In | C++", First Editio | n, USA IST | ГЕ, 2002. | |
| 2. Stanley | B. Lippman, Josée Lajoie and I | Barbara E. Moo, "C | ++ Primer' | ', Fifth Edition | ,O'Reilly, 2013. |
| Mode of Eva | aluation: CAT / Assignment | /Quiz/FAT/Pr | oject / Sei | ninar | |
| | | | | | |
| | enging Experiments (Indicat | | | | |
| | lamental constructs in C++ incl | uding Classes and | Objects | | |
| | structors and Destructors | | | | |
| | es of Overloading | | | | |
| • • | es of inheritance | | | | |
| | ters and Inheritance | | | | |
| | al Functions | | | | |
| 7. File | streams | | | | |
| | | | otal Labo | ratory hours | 20 hours |
| | sessments: Assessments/Mid | | | | |
| | ded by Board of Studies | 07-06-2019 | D-4 | 12.0(2010 | |
| Approved t | y Academic Council | No. 55 | Date | 13-06-2019 | |



| Course Code | | Course Title | è. | | L | Т | Р | J | С |
|--|--|-----------------------|--------------|---------------|---------|--------|--------|-------|----|
| CBS1901 | Technical Answ | ers for Real Wor | ld Probler | ns (TARP) | 1 | 0 | 0 | 4 | 2 |
| Pre-requisite | 115 Credits Earned | | | | Sylla | abus | | ion | |
| | | | | | | v. 1 | .0 | | |
| Course Objectiv | | | | | | | | | |
| - | ts to identify the need for | | | - | | | | | |
| | nts to propose and imp | olement relevant t | echnology | for the dev | elopme | ent o | f the | ; | |
| prototypes / p | | | | | • | | | | |
| | students learn to the us | se the methodolog | gies availa | ble for analy | yzıng t | he d | evelo | opec | 1 |
| prototypes / pr | roducts | | | | | | | | |
| Expected Cours | e Outcome: | | | | | | | | |
| At the end of the | course, the student will | be able to | | | | | | | |
| 1. Identify real li | ife problems related to so | ociety | | | | | | | |
| 2. Apply appropriate the second secon | riate technology(ies) to a | ddress the identified | ed problem | s using engir | neering | princ | ciples | and | 1 |
| arrive at inno | vative solutions | | | | | | | | |
| | | | | | | | | | |
| Module1 | | | | | | | 15 h | our | S |
| 1. Identification | of real-life problems | | | | | | | | |
| 2. Field visits car | n be arranged by the facu | alty concerned | | | | | | | |
| 3. $6-10$ student | ts can form a team (with | in the same / differ | ent discipl | ine) | | | | | |
| 4. Minimum of e | eight hours on self-manag | ged team activity | | | | | | | |
| | cientific methodologies to | | | | | | | | |
| | ould be in the form | | n/coding/n | nodeling/pro | duct | desig | gn/pr | oce | SS |
| e | nt scientific methodolog | | | | | | | | |
| | report to be submitted for | | | | | | | | |
| - | involvement and contr | • • | | - | | t hou | rs w | ill b | e |
| | odalities for the continu | | • | 1 | | _ | | _ | |
| • | me to be evaluated in ter | ms of technical, ed | conomic, s | ocial, enviro | nmenta | ıl, po | litica | ıl an | d |
| demographic | • | . 1 | | | | | | | |
| | of each group member to | | i alta an af | 20.20.50 | | | | | |
| 1 0 | omponent to have three retion: (No FAT) Contin | | 0 0 | | oult m | iaht | 0.00 | .f | |
| | ct report to be submitte | | | | ark we | agiit | age (| л | |
| | by Board of Studies | 29-01-2021 | na projeci | 1010103 | | | | | |
| Approved by Ac | • | No:61 | Date | 18-02-202 | 21 | | | | |
| | www.me ovulien | 110101 | Dutt | | • 4 | | | | |



| Course Code | | Course Title | | | L | Т | P | J | С |
|--|--------------------------|---------------------------------|------------|------------|-------|---------|-------|--------|-------|
| CBS1902 | | Industrial Pro | ject | | 0 | 0 | 0 | 0 | 1 |
| Pre-requisite | Completion of mi | nimum of Two | semester | 3 | | Sylla | bus | versio | n |
| • | • | | | | | v.1 | | | |
| Course Objectives | | | | | L | | | | |
| | ned so as to expose | the students to | industry e | nvironmen | t and | d to ta | ike u | p on- | site |
| assignment as traine | _ | | • | | | | | • | |
| | | | | | | | | | |
| Expected Course (| Outcome: | | | | | | | | |
| At the end of this in | ternship the student sh | hould be able to: | | | | | | | |
| 1. Have an exposur | re to industrial practic | es and to work in | teams | | | | | | |
| 2. Communicate ef | fectively | | | | | | | | |
| 3. Understand the | impact of engineering | g solutions in a | global, ec | onomic, en | viro | nment | al an | id soc | ietal |
| context | | | | | | | | | |
| 4. Develop the abil | ity to engage in researc | ch and to involve | in life-lo | g learning | | | | | |
| - | ntemporary issues | | | 0 0 | | | | | |
| - | ishing his/her digital f | footprint | | | | | | | |
| | | 1 | | | | | | | |
| Contents | | | | | | | | 4 W | eeks |
| | at industry site | | | | 1 | | | | |
| Four weeks of work | at maabily site. | | | | | | | | |
| Four weeks of work Supervised by an exp | | | | | | | | | |
| | | | | | | | | | |
| Supervised by an exp | | t, Presentation a | and Proje | ct Review | | | | | |
| Supervised by an exp | pert at the industry. | t, Presentation a 29-01-2021 | and Proje | ct Review | | | | | |



| CBS1903 Comprehensive Examination 0 <t< th=""><th>Pre-requisite Minimum of 115 credits should be earned Syllabus version v. 1.0 Course Objectives: v. 1.0 To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Business Systems Systems Expected Course Outcome: At the end of the course, the student will be able to I. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain of Computer science and Engineering and apply that essential knowledge to the field of Business systems. Module:1 Programming in C, Object Oriented Programming, Data Structures and Algorithms C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. C++ classes, Objects, Inheritance Virual function- Exception Handling-Generic Templates-Files. Asymptotic Notations- The Big-O, Omeg and Theta notation- Stack, Queue, Linked List, Applications of Stack, Queue, and Linked List Tree Binary Tree, Tree Traversals, Binary Search Tree- Graph, Minimum Spanning Tree, Shortest Pat Algorithm-Searching - Binary, Linear, BFS, DFS Sorting - Insertion, Selection, Shell, Quick and Merge Sor Module:2 Design and analysis of Algorithms, Computer Organization and Architecture, Forma languages and Automata theory Classes of complexity, Analyzing the Time and Space complexity- Iterative and recursive, Algorithm strategies: Brute force, Greedy, Dynamic programming, Graph algorithms: DFS, BFS, MST, Shortest pa algorithm. Instructions-Addressing Modes-Instruction Pipelining-Data Representation-Characteristics of Memory-LoCache Memory- L/O fundamentals- L/O Techniques -Direct Memor Access - Interrupts RAID archit</th><th>Pre-requisite Minimum of 115 credits should be earned Syllabus version Course Objectives: v. 1.0 To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Busines Systems Systems Expected Course Outcome: At the end of the course, the student will be able to 1. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain Computer science and Engineering and apply that essential knowledge to the field of Business systems. Module:1 Programming in C, Object Oriented Programming, Data Structures and Algorithms C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. C++ classes, Objects, Inheritan Vitual function- Exception Handling-Generic Templates-Files. 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Instructions-Addressing Modes-Instruction Pipelining-Data Representation-Characteristics Memories - Memory Hierarchy-Cache Memory- 1/O fundamentals- 1/O Techniques -Direct Mem A</th><th>Course</th><th>Code</th><th></th><th></th><th>Course</th><th>Title</th><th></th><th>L</th><th>Т</th><th>P</th><th>J</th><th>С</th></t<> | Pre-requisite Minimum of 115 credits should be earned Syllabus version v. 1.0 Course Objectives: v. 1.0 To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Business Systems Systems Expected Course Outcome: At the end of the course, the student will be able to I. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain of Computer science and Engineering and apply that essential knowledge to the field of Business systems. Module:1 Programming in C, Object Oriented Programming, Data Structures and Algorithms C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. 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|---|--|--|----------------|----------------|------------|------------|--------------|-------------|-------------------|----------|---------|---------|---------|----------------|
| V. 1.0 Course Objectives: To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Business Systems Expected Course Outcome: At the end of the course, the student will be able to 1. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain o Computer science and Engineering and apply that essential knowledge to the field of Business systems. Module:1 Programming in C, Object Oriented Programming, Data Structures and Algorithms C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. C++ classes, Objects, Inheritance Virual function- Exception Handling-Generic Templates-Files. 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Finite Automata-Deterministic Finiti Automata, Non - Deterministic Finitie Automata -Equivalence of NFA and DFA-Applications of NFA Finite Automata with Epsilon Transition- Regular Languages, Building Regular Expressions.DFJ to Regul | V. 1.0 Course Objectives: To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Business Systems Expected Course Outcome: At the end of the course, the student will be able to 1. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain of Computer science and Engineering and apply that essential knowledge to the field of Business systems. Module:1 Programming in C, Object Oriented Programming, Data Structures and Algorithms C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. C++ classes, Objects, Inheritance Virual function- Exception Handling-Generic Templates-Files. 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VITT[®] Vellore Institute of Technology

CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Operating System Services, OS Types, Process, System Calls, CPU Scheduling Algorithms, Inter-Process Communication, Deadlock, Memory Allocation, Virtual Memory, Paging, Segmentation, Page Replacement Algorithms, File Allocation Methods, Directory Implementation Methods, I/O Devices, Disk Scheduling algorithms. Data Abstraction, Data Independence, Entity-Relationship Model, Relational Model,

Integrity Constraints, Functional Dependencies, Normal Forms, Dependency Preservation, Relational Algebra, Query Optimization, Transaction Processing, Concurrency Control and Recovery Techniques, Database Storage Strategies, Authentication and Authorization. Process Models- Cost benefit Analysis-COCOMO model- DFD- ER-Design models- Object Oriented Design-Testing- Levels of Testing-Software Project Management-Project Scheduling-Risk Analysis-Quality Metrics- Configuration Management.

Module:4 Computer Networks, Information security

Computer networks and distributed systems, Classifications of computer networks, Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, LAN, Bandwidth utilization, Error Detection and Error Correction, Flow Control and Error control protocols, Logical addressing, UDP,TCP, Congestion Control, Quality of Service (QoS), DNS, DDNS, TELNET, EMAIL, FTP, WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts of Cryptography. Confidentiality, integrity and availability -Discretionary, mandatory, roll-based and task-based models - Spatio-temporal models - Confidentiality policies, integrity policies, hybrid policies - Control of access and information flow - Data privacy, introduction to digital forensics – Security Architecture (Operating Systems, Database)

| Module:5 | Introduction | to IP man | agement | and | Entreprenet | ırship, Fundan | nentals of |
|----------|--------------|-----------|----------|-----|-------------|----------------|------------|
| | Management, | Marketing | Research | & | Marketing | management, | Financial |
| | management | | | | | | |

Strategic Management, Business Processes and Capabilities-based Approach to Strategy, Five Forces of Industry Attractiveness that Shape Strategy, Mergers & Acquisitions, Corporate Governance, Leadership Styles, Change Management, Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo etc., Work Stress and Stress Management, Organizational structure, Organizational Culture, Managerial Ethics, Corporate social responsibility, Attributes of a leader, Contemporary issues in management, Concept of IP Management, Use in marketing, Debt, Venture Capital and other forms of Financing, Types of Intellectual Property, Elements of Marketing Mix, Analyzing needs & trends in Environment - Macro, Economic, Political, Technical & Social, Product Life cycle concept, New Product development & strategy, Marketing Channels in retailing, Marketing Communication, Marketing Research Techniques, Strategy and Planning for Internet Marketing, Relationship, networks and customer relationship management, Business to Business marketing strategy, Financial Environments, The Capital Asset Pricing Model (CAPM), Analysis in leverage study.

| Mode of Evaluation: CAT / Assignment | / Quiz / FAT / La | ab | |
|--|-------------------|------|------------|
| Recommended by Board of Studies | 29-01-2021 | | |
| Approved by Academic Council | No. 61 | Date | 18-02-2021 |



| Course Code | Cours | e Title | | L | T | Р | J | С |
|---------------------------|----------------------------|-----------------------|--------------|----------------|--------|--------|-------|-------|
| CBS1904 | Capstone | Project | | 0 | 0 | 0 | 0 | 12 |
| Pre-requisite | As per the academ | nic regulations | | Syl | labus | vers | sion | |
| | | | | | v | 1.0 | | |
| Course Objectives: | | | | · | | | | |
| To provide sufficient | hands-on learning exp | perience related to | the desig | n, developm | ent a | nd ar | nalys | is of |
| suitable process so as t | o enhance the technical | l skill sets in the c | hosen field | • | | | | |
| | | | | | | | | |
| Expected Course Ou | | | | | | | | |
| At the end of the cours | | | | | | | | |
| - | c problem statements f | or ill-defined real | life proble | ms with reas | onable | e assi | umpt | ions |
| and constraints. | | | | | | | | |
| | e search and / or patent | | | | | | | |
| - | nents / Design and Ana | - | rations and | l document t | he res | ults. | | |
| | alysis / benchmarking | - | , . . | / 1 .• | | | | |
| - | sults and arrive at scien | | - | / solution | | | | |
| 6. Document the res | sults in the form of tec | chnical report / pre | esentation | | | | | |
| Contents | | | | | | | | |
| | ay be a theoretical and | alveis modeling (| e cimulati | on experime | ntatio | n & | anal | voie |
| | orrelation and analysi | • • | | - | | | | • |
| other related activit | = | is of data, softwar | e develop | ment, apprie | u 1050 | | | any |
| | ne or two semesters ba | used on the comple | etion of rec | uired numbe | erofo | credit | ts as | per |
| the academic regula | | ľ | | 1 | | | | 1 - |
| Ũ | ork or a group project, | with a maximum | of 3 studer | nts. | | | | |
| | jects, the individual pro- | | | | the i | ndivi | idual | 's |
| contribution to the | group project. | | | | | | | |
| | r outside the university, | | • | | | | | |
| 6. Publications in the p | peer reviewed journals | / International Co | nferences v | will be an add | led ac | lvant | age | |
| | | | | | | | | |
| Mode of Evaluation: | Periodic reviews, Pro | esentation, Final | oral viva, | Poster subr | nissic | n | | |
| Recommended by Bo | | 29-01-2021 | | | | | | |
| Approved by Acaden | aic Council | No:61 | Date | 18-02-202 | 21 | | | |



| Course Code | Course Title | L | Т | P | J | С |
|---|---|--|--|---|---|--|
| CHY1701 | Engineering Chemistry | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | Chemistry of 12 th standard or equivalent | | Sylla | abus | vers | sion |
| | | | | v. 1. | 0 | |
| Course Objectives: | | | | | | |
| 1. To impart techno | ological aspects of applied chemistry | | | | | |
| 2. To lay foundation | n for practical application of chemistry in engineering aspe | ects | | | | |
| | | | | | | |
| Expected Course Out | come: | | | | | |
| 1. Students will be fami | iliar with the water treatment, corrosion and its control, en | gine | ering a | appli | catic | ns of |
| polymers, types of | fuels and their applications, basic aspects of electrochem | istry | and e | lecti | och | emical |
| energy storage devic | ces | | | | | |
| | | | | | | |
| | Vater Technology | | | | our | |
| Characteristics of hard | water - hardness, DO, TDS in water and their determinat | ion - | nume | erica | l pro | blems |
| in hardness determinat | tion by EDTA; Modern techniques of water analysis for | or inc | lustria | ul us | e - | |
| Disadvantages of hard v | water in industries. | | | | | |
| | | | | | | |
| | | | | | | |
| Specifications of water for municipal supply | Water Treatment ods: - Lime-soda, Zeolite and ion exchange processe r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor | volv rinat | ed in v ion; I | ir ap wate: Dome | r tre estic | ations. atment water |
| Water softening meth Specifications of water for municipal supply purification – Candle | ods: - Lime-soda, Zeolite and ion exchange processer for domestic use (ICMR and WHO); Unit processes in | volv rinat | ed in v ion; I | ir ap wate: Dome | plic r tre estic | ations. atment water |
| Water softening meth Specifications of water for municipal supply purification – Candle | ods: - Lime-soda, Zeolite and ion exchange processe r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection met | volv rinat | ed in v ion; I | ir ap wate: Dome | plic r tre estic | ations. atment water n, UV |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 | ods: - Lime-soda, Zeolite and ion exchange processe r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection met Reverse Osmosis; Electro dialysis. | volvo rinat hods | ed in v ion; I - Ultr | ir ap wate Dome afilt | plic r tre estic ratio | ations. atment water n, UV 6 hour |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion | ods: - Lime-soda, Zeolite and ion exchange processe r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection met Reverse Osmosis; Electro dialysis. | volvo rinat hods | ed in v ion; I - Ultr lecora | ir ap wate: Dome afilti | oplic r tre estic ratio | ations. atment water n, UV 6 hour forms, |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. | volvo rinat hods | ed in v ion; I - Ultr lecora | ir ap wate: Dome afilti | oplic r tre estic ratio | ations. atment water n, UV 6 hour forms, |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack | volvo rinat hods | ed in v ion; I - Ultr lecora | ir ap wate: Dome afilti | oplic r tre estic ratio | ations. atment water n, UV 6 hour forms, |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack | volvo rinat hods | ed in v ion; I - Ultr lecora | ir ap wate: Dome afilti | oplic r tre estic ratio | ations. atment water n, UV 6 hour forms, |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti corrosion and choice of Module: 4 | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack f parameters to mitigate corrosion. | volvo rinat hods & c ing; | ed in v ion; I - Ultr lecora Facto | ir apwate: Dome afilti tive rs th | pplic r treestic ratio art art er | ations. atment water n, UV 6 hour forms, hance 4 hour |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti corrosion and choice of Module: 4 Corrosion protection - Advanced protective | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack f parameters to mitigate corrosion. Corrosion Control cathodic protection – sacrificial anodic and impressed cu coatings: electroplating and electroless plating, PVD | volvo rinat hods & c ing; | ed in v ion; I - Ultr lecora Facto t prote CVD | ir apwate: Dome afilti tive rs th ection 2. Al | pplic r treestic ratio art at en n me loyi | ations. atment water n, UV 6 hour forms, hance 4 hour ethods; ng for |
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| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differenti corrosion and choice of Module: 4 Corrosion protection – Advanced protective corrosion protection – Ferrous and non-ferro | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack f parameters to mitigate corrosion. Corrosion Control cathodic protection – sacrificial anodic and impressed cu coatings: electroplating and electroless plating, PVD Basic concepts of Eutectic composition and Eutectic mix | volvo rinat hods & c ing; | ed in v ion; I - Ultr lecora Facto t prote CVD | ir apwate: Dome afilti tive rs th ection 2. Al | pplic r treestic ratio art at en n me loyi | ations. atment water n, UV 6 hour forms, hance 4 hour ethods; ng for |
| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differentic corrosion and choice of Module: 4 Corrosion protection – Advanced protective corrosion protection – Ferrous and non-ferror Module: 5 | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes in - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection meth Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack f parameters to mitigate corrosion. Corrosion Control cathodic protection – sacrificial anodic and impressed cu coatings: electroplating and electroless plating, PVD Basic concepts of Eutectic composition and Eutectic mix bus alloys. | volve rinat hods & c ing; rren and tures | ed in v ion; I - Ultr lecora Facto t prote CVD s - Sele | ir apwates Doma afilti trive rs th ection All ected | pplic r tree estic ratio art at er loyi l exa | ations. atment water n, UV 6 hour forms, ihance 4 hour ethods; ng for umples 6 hour |
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| Water softening meth Specifications of water for municipal supply purification – Candle treatment, Ozonolysis, I Module: 3 Dry and wet corrosion emphasizing Differentic corrosion and choice of Module: 4 Corrosion protection – Advanced protective corrosion protection – Ferrous and non-ferror Module: 5 Brief introduction to consystems: Lithium batter | ods: - Lime-soda, Zeolite and ion exchange processes r for domestic use (ICMR and WHO); Unit processes im - Sedimentation with coagulant- Sand Filtratio - chlor filtration- activated carbon filtration; Disinfection met Reverse Osmosis; Electro dialysis. Corrosion n - detrimental effects to buildings, machines, devices ial aeration, Pitting, Galvanic and Stress corrosion crack f parameters to mitigate corrosion. Corrosion Control cathodic protection – sacrificial anodic and impressed cu coatings: electroplating and electroless plating, PVD Basic concepts of Eutectic composition and Eutectic mix bus alloys. Electrochemical Energy Systems onventional primary and secondary batteries; High energy | volve rinat hods & c ing; rrren and tures | ed in v ion; I - Ultr lecora Facto t prote CVD s - Selo | ir apwates Doma afilti trive rs th ection 0. All ecteon hemi ions. | pplic r tree estic ratio art at er loyi l exa | ations. atment water n, UV 6 hour forms, hance 4 hour ethods; ng for umples 6 hour energy el cells |





B. Tech Computer Science and Engineering and Business Systems

sensitized solar cells - working principles, characteristics and applications.

Module: 6Fuels and Combustion8 hoursCalorific value - Definition of LCV, HCV. Measurement of calorific value using bomb calorimeter and
Boy's calorimeter including numerical problems. Controlled combustion of fuels - Air fuel ratio -
minimum quantity of air by volume and by weight-Numerical problems-three way catalytic converter-
selective catalytic reduction of NOX; Knocking in IC engines - Octane and Cetane number - Anti-
knocking agents.

Module: 7 Polymers

Difference between thermoplastics and thermosetting plastics; Engineering application of plastics - ABS, PVC, PTFE and Bakelite; Compounding of plastics: molding of plastics for Car parts, bottle caps (Injection molding), Pipes, Hoses (Extrusion molding), Mobile Phone Cases, Battery Trays, (Compression molding), Fiber reinforced polymers, Composites (Transfer molding), PET bottles (blow molding); Conducting polymers - Polyacetylene- Mechanism of conduction – applications (polymers in sensors, self-cleaning windows)

| Mod | ule: 8 | Contemporary | issues: | | 2 hours |
|-------|-----------------------|------------------|-------------------------|-----------------------------|--------------------|
| Lectu | are by Industry Expen | ts | | | |
| | | | | Total Lecture hours: | 45 hours |
| | | | | | |
| Text | : Book(s) | | | | |
| 1. | Sashi Chawla, A | Fext book of E | ngineering Chemistr | ry, Dhanpat Rai Publishi | ng Co., Pvt. Ltd., |
| | Educational and Te | chnical Publishe | ers, New Delhi, 3rd E | d., 2015. | |
| 2. | O.G. Palanna, McG | raw Hill Educat | tion (India) Pvt. Ltd., | 9th Reprint, 2015. | |

- 3. B. Sivasankar, Engineering Chemistry 1st Ed., McGraw Hill Education, 2008
- 4. "Photovoltaic Solar Energy: From Fundamentals to Applications", Angèle Reinders et al., Wiley publishers, 2017.

Reference Books 1 O.V. Roussak and H.D. Gesser, Applied Chemistry - A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013. 2 S. S. Dara, A Text book of Engineering Chemistry, S. Chand & Co.I.td, New Delbi, 20 th dition, 2013.

S. S. Dara, A Text book of Engineering Chemistry, S. Chand & Co Ltd., New Delhi, 20 Edition, 2013.

Mode of Evaluation: Internal Assessment (CAT, Quizzes, Digital Assignments) & FAT

| List o | of Experiments | |
|--------|--|---------|
| 1. | Water Purification: Estimation of water hardness by EDTA method and its removal by | 3 hours |
| | ion-exchange resin | |
| | Water Quality Monitoring: | 6 hours |
| 2. | Assessment of total dissolved oxygen in different water samples by Winkler's method | |
| 3. | Estimation of sulphate/chloride in drinking water by conductivity method | |
| 4/5. | Material Analysis: Quantitative colorimetric determination of divalent metal ions of | 6 hours |
| | Ni/Fe/Cu using conventional and smart phone digital-imaging methods | |
| 6. | Arduino microcontroller-based Sensor monitoring pH/temperature/conductivity in | 3 hours |
| | samples | |

6 hours





| 7. | Iron in carbon steel by potentiometry | 7 | | | 3 hours |
|-----|--|---------------------------------|--------------|-------------------------|--------------------------|
| 8. | Construction and working of an Zn-C | u electrochemica | l cell | | 3 hours |
| 9. | Determination of viscosity-average polymers | e molecular wei | ght of diff | erent natural/synthetic | 6 hours |
| 10. | Preparation/demonstration of a work 1. Construction and working of eledemonstrate working of the system. 2. Model corrosion studies (buckling of 3. Demonstration of BOD/COD | ectrochemical er | nergy system | | Non- contact hours |
| | de of Evaluation: CAT / Assignmer ommended by Board of Studies | nt / Quiz / FAT / 31-05-2019 | 'Lab | | |
| | proved by Academic Council | No:55 | Date | 13-06-2019 | |





| Course C | Code | Course Tit | le | L | Τ | Р | J | C |
|--|--|--|-----------------------|----------|--------|----------|--------|------|
| CSE10 | 08 | Programming | in C | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | | NIL | | S | yllabı | us ver | sion | |
| | | | | | | v.1.0 | | |
| Course Objecti | ves: | | | | | | | |
| 1. To impart es | sential probl | m solving skills through general | problem solving con | ncepts. | | | | |
| 2. To provide b | asic knowle | ge on programming essentials us | ing C as implementa | ation to | ol. | | | |
| 3. To introduce | the Unix fil | e system interface and introduce | various programming | g meth | odsus | sing C | | |
| | | | | | | | | |
| Expected Cour | | | | | | | | |
| After completion | n of this cou | se, students will be able to: | | | | | | |
| - | | given problem using algorithm ar | • | | | | | |
| 2. Infer the fu | ndamental p | ogramming elements in C langu | age and learn to app | oly basi | ccont | rol stu | ructu | es |
| in C. | | | | | | | | |
| | - | s of modular programming appro | each in C and demon | strate 1 | thesau | ne in | the r | eal |
| world scen | | | | | | | | |
| | - | rinciples of pointers and their as | ssociation with varie | ous dat | a stru | ctures | duri | ng |
| implement | | | | | | | | |
| | | ations of structures and unions. | | | | | | |
| | - | utput and error handling funct | ions in C while so | lving 1 | the g | iven p | oroble | em |
| - | ix system ir | | | | 1 | | | |
| 7. Showcase t | he attained k | nowledge by applying them to so | lve various real-worl | ld prob | lems. | | | |
| Module:1 | Conoral Dr | oblem-Solving Concepts | | | | | 3 ho | |
| | | <u> </u> | ntial Lagia Structure | n Dad | inian | d | | |
| - | | or problem solving with Seque. Iuction to imperative language; | - | | | | | - |
| (ANSI C) | uages. milo | fuction to imperative language, | syntax and construct | | i spec | | angu | ige |
| (/11/01/C) | | | | | | | | |
| Module:2 | Types Ope | rator and Expressions with d | liscussion of varia | ble na | ming | | 4 ho | ur |
| | | rian Notation | | | 8 | , | | |
| Variable Names | 8 | and Sizes (Little Endian Big I | Endian), Constants, | Declar | atior | is. Ar | ithm | etic |
| | · · · · | tors, Logical Operators, Type C | , | | | , | | |
| | - | ent Operators and Expressions, | | | | - | - | |
| • · | - | | | | | | | |
| - | and Hungar | | | | | | | |
| Bitwise Operato | and Hungar | | | | | | | |
| Bitwise Operato | and Hungar | | structured and | unstr | uctur | ed | 7 ho | ur |
| Bitwise Operato variable naming Module:3 | Control I programm | low with discussion on ing | | | | | | |
| Bitwise Operato variable naming Module:3 | Control I programm | low with discussion on | | | | | | |
| Bitwise Operato variable naming Module:3 | Control I programm Blocks, If | low with discussion on ing Else-If, Switch, Loops - while | | | | | | |
| Bitwise Operato variable naming Module:3 Statements and | Control I programm Blocks, If | low with discussion on ing Else-If, Switch, Loops - while | | | | | | |
| Bitwise Operato variable naming Module:3 Statements and | Control I programm Blocks, If | low with discussion on ing Else-If, Switch, Loops - while | | | | | | |



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| Module:4 | Functions and Program Structure with discussion on standard | 6 hour |
|--|---|--|
| | library | |
| | ctions, parameter passing and returning type, C main return as integer, External | |
| | Register Variables, Scope Rules, Block structure, Initialisation, Recursion, Prepro | cessor, |
| Standard Lib | rary Functions and return types | |
| | | |
| Module:5 | Pointers and Arrays | 8 hour |
| | address, Pointers and Function Arguments, Pointers and Arrays, Address | |
| character Po | pinters and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensiona | l array an |
| Row/column | n major formats, Initialisation of Pointer Arrays, Command line arguments | , Pointer t |
| functions, co | omplicated declarations and how they are evaluated. | |
| | | |
| Module:6 | Structures & Input/Output | 9 hour |
| Basic Struc | ures, Structures and Functions, Array of structures, Pointer of structures, | Self-referra |
| Structures, 7 | able look up, Typedef, Unions, Bit-fields. | |
| Input and C | utput: Standard I/O, Formatted Output - printf, Formated Input - scanf, Var | iable lengt |
| | st, file access including FILE structure, fopen, stdin, sdtout and stderr, Erro | |
| | | |
| - | t, perror and error.h, Line I/O, related miscellaneous functions | |
| - | t, perror and error.h, Line I/O, related miscellaneous functions | |
| including ext | t, perror and error.h, Line I/O, related miscellaneous functions Unix system Interface & Programmingmethods | 6 hour |
| including ext | Unix system Interface & Programmingmethods | |
| including ext Module:7 File Descrip | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a | |
| including ext Module:7 File Descrip Discussions | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. | ccess -Isee |
| including ext Module:7 File Descrip Discussions Programming | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a | ccess - Isee |
| including ext Module:7 File Descrip Discussions | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. | ccess - Isee |
| including ext Module:7 File Descrip Discussions Programming | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. | ccess - Isee |
| including ext Module:7 File Descrip Discussions Programming utility. Module:8 | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func | ccess - Isee tion, makefi |
| including ext Module:7 File Descrip Discussions Programming utility. Module:8 | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues | ccess - Isee tion, makefi 2 hour |
| including ex Module:7 File Descrip Discussions Programmin utility. Module:8 | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization | ccess -Isee tion, makef 2 hour |
| including ext Module:7 File Descrip Discussions Programming utility. Module:8 | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: | ccess -Isee tion, makefi 2 hour |
| including exi Module:7 File Descrip Discussions Programmin utility. Module:8 Guest lecture Text Book(| Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: | ccess -Isee tion, makefi 2 hour 45 hour |
| including exi Module:7 File Descrip Discussions Programmin utility. Module:8 Guest lecture Text Book(| Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: | ccess - Isee tion, makefi 2 hour 45 hour |
| including exit Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book() 1. B. W. 2015. | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: | ccess - Isee tion, makefi 2 hour 45 hour arson, June |
| Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book() 1. B. W. 2015. 2. Gary J | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: S) Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe | ccess - Isee tion, makefi 2 hour 45 hour arson, June |
| including exit Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book(1) 1. B. W. 2015. 2. Gary J Fourth | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: s) Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Priva | ccess -Isee tion, makefi 2 hour 45 hour arson, June ate Limited |
| Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book() 1. B. W. 2015. 2. Gary J Fourth 3. B. Go | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: s) Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Priva edition, 2016. | ccess -Isee tion, makefi 2 hour 45 hour arson, June ate Limited |
| Including exiting Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book() 1. B. W. 2015. 2. Gary J Fourth 3. B. Go Publisl | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: s) Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Priva edition, 2016. ttfried, "Programming in C", Second Edition, Schaum Outline Series, Tata Meners, 1996. | ccess -Isee tion, makefi 2 hour 45 hour arson, June ate Limited |
| Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book() 1. B. W. 2015. 2. Gary J Fourth 3. B. Go Publis | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Total Lecture hours: s) Kernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Priva edition, 2016. ttfried, "Programming in C", Second Edition, Schaum Outline Series, Tata Meners, 1996. | ccess -Isee tion, makefi 2 hour 45 hour arson, June ate Limited |
| including exit Module:7 File Descrip Discussions Programming utility. Module:8 Guest lecture Text Book(# 1. B. W. 2015. 2. Gary J Fourth 3. B. Go Publis Reference I 1. Herber | Unix system Interface & Programmingmethods tor, Low level I/O - read and write, Open, create, close and unlink, Random a on Listing Directory, Storage allocator. g Method: Debugging, Macro, User Defined Header, User Defined Library Func Contemporary Issues by Industry Experts or R&D organization Start Remighan and D. M. Ritchi, "The C Programming Language", Second Edition, Pe Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Privatedition, 2016. ttfried, "Programming in C", Second Edition, Schaum Outline Series, Tata Moners, 1996. Books | ccess -Isee tion, makefi 2 hour 45 hour arson, June ate Limited |





| List o | List of Challenging Experiments (Indicative) | | | | | | | |
|--------|--|-------------------|-----------------|-----------------|----------|--|--|--|
| 1. | 1. Algorithm and flowcharts of small problems like GCD | | | | | | | |
| 2. | Small but tricky codes (use of operators and expressions) | | | | | | | |
| 3. | Solving sequences (applications of control structures) | | | | | | | |
| 4. | Proper parameter passing (User defined f | unctions) | | | | | | |
| 5. | Command line Arguments (Understandin | g main()) | | | | | | |
| 6. | Variable parameter (Pointers and Arrays) | | | | | | | |
| 7. | Pointer to functions (Pointer and functio | ns) | | | | | | |
| 8. | User defined header (Creation of headers |) | | | | | | |
| 9. | Make file utility (unix make file) | | | | | | | |
| 10. | Multi file program and user defined librar | ries (Use of pre- | processor direc | ctives) | | | | |
| 11. | Interesting substring matching / searching | g programs (Stri | ing matching a | ndsearching) | | | | |
| | 1 | | Total L | aboratory Hours | 30 hours | | | |
| Mo | Mode of Assessment: Assessments/ Mid Term Lab/ FAT / Project | | | | | | | |
| Rec | Recommended by Board of Studies 07-06-2019 | | | | | | | |
| Арр | Approved by Academic CouncilNo. 55Date13-06-2019 | | | | | | | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course code | Course title | L | Τ | P | J | C |
|-------------------------|---|-------|--------|--------|----------|------|
| ENG1013 | Business Communication & Value Science – I | 1 | 0 | 2 | 0 | 2 |
| Pre-requisite | Basic Knowledge of high school English | | - | | vers | ion |
| | | | | v. 1.(|) | |
| Course Objectives: | | | | | | |
| | oncepts of life skills and its importance | | | | | |
| | ts to look within and create a better version of self. | | | | | |
| 3. To introduce them t | o key concepts of values, life skills and business communication | 1 | | | | |
| Expected Course Ou | itcome: | | | | | |
| - | I for life skills and values. | | | | | |
| 2. Acquaint the learner | rs with basics of pronunciation | | | | | |
| - | ngths and opportunities | | | | | |
| U | lls to different situations | | | | | |
| - | sic tenets of communication | | | | | |
| | nmunication practices in different types of communication. | | | | | |
| 11 2 | 1 71 | | | | | |
| | ementary Grammar & Vocabulary Enrichment | | | | 2 ho | |
| • | grammar-Parts of Speech; reading newspapers for vocabu | ılary | / dev | velop | men | t - |
| Understanding Tenses | & Common mistakes in everyday conversation. | | | | | |
| | | | | | <u> </u> | |
| | nonics in English | | | | 2 ho | |
| | l Consonants – Minimal Pairs- Consonant Clusters- Past Ten | se N | /larke | er an | d Ph | iral |
| Marker.Activity: Work | (sneets, Exercises | | | | | |
| Module:3 Co | ommunication Skills | | | | 2 ho | urs |
| Overview of Commu | nication Skills Barriers of communication, Types of commu | nica | ation- | - Vei | rbal : | and |
| Non-verbal &Effective | | | | | | |
| | | | | | 21 | |
| | troduction to Life Skills | • | | | 2 ho | |
| • | working with rhythm and balance, teamwork - Pursuit of Hap | opin | ess. | what | t are | the |
| skins and values you c | an identify, what can you relate to? | | | | | |
| Module:5 A | rt of Public Speaking | | | | 2 ho | urs |
| | nce of Non-verbal Communication, Technical Talks, Dyna | mic | s of | Prof | essic | nal |
| Presentations – Indiv | • | | | | | |
| | * | | | | | |
| Module:6 W | riting Skill | | | | 2 ho | urs |
| Summary writing, stor | y writing and creating a Podcast | | | | | |
| Module:7 Co | orrespondence and Career Development | | | | 3 ho | |
| | & Application Writing Activity: Compose letters; Emails, leave a | annli | icatio | | | |
| Preparation/CV- star | t writingyour comprehensive CV including every achieveme eparation of Video Profile. | | | | | |
| rouvity. II | | | | | | |





| Mod | lule: 8 | Contemporary Issues | | | | 2 hours |
|------|-----------------|---------------------------------|----------------------------------|-------------|-----------------|----------|
| | | ndustry Experts or R&D org | anization | | I | |
| | | | | Total | Lecture hours: | 15 hours |
| Lab | Experiments | 5: | | | | |
| 1 | Listening: Ca | asual and Academic | | | | |
| 2 | Speaking: So | ocializing Skills - Introducing | g Oneself- His / He | er Goals & | SWOT | |
| 3 | Group Discu | ssion: Factual, controversial | and abstract issues | 5 | | |
| 4 | | skill: JAM, Narrating a stor | y/anecdote | | | |
| 5 | Writing: Tra | velogue | | | | |
| 6 | - | king: Extempore /Monologue | | | | |
| 7 | | nderstanding Inter and Cross | | | | |
| 8 | | ommunity service-work with | | 1 | 1 7 | |
| 9 | | amous Personalities motivation | | | ies | |
| 10 | Soft skills - N | Mock Job/Placement Interview | ews/ Video Resum | | - 1 | |
| | | | | Total Lab | ooratory hours: | 30 hours |
| Text | t Book(s) | | | | ŀ | |
| 1. | Kumar.Sanja | y & Pushplata, Communicat | ion Skills, 2 nd Edit | ion, OUP, 2 | 2015 | |
| 2. | Koneru, Aru | naProfessional Speaking Ski | lls, OUP, 2015. | | | |
| Refe | erence Books | | | | | |
| 1. | Mc'carthy,M | lichael &O'dell,Felicity, Engl | ish Vocabulary in u | use,CUP,20 | 010 | |
| 2. | SarojHirema | th, Saroj, Business communi | cation, NiraliPraka | shan, 2018 | • | |
| Mod | le of Evaluat | tion: CAT / Assignment / | Quiz / FAT | | | |
| Reco | ommended b | y Board of Studies | 07-06-2019 | | | |
| App | roved by Aca | demic Council | No. 55 | Date | 13-06-2019 | |





| Course code | | L | Т | Р | J | C |
|--------------------------|---|------|-------|--------|-------|----------|
| ENG1014 | Business Communication & Value Science – II | 1 | 0 | 2 | 0 | 2 |
| Pre-requisite | | Sy | llab | us ve | ersio | n |
| | | | 1 | v. 1.0 | | |
| Course Objective | es: | | | | | |
| 1. To develop effe | ctive writing, reading, presentation and group discussion skills. | | | | | |
| 2. To help students | s identify personality traits and evolve as a better team player. | | | | | |
| 3. To introduce the | em to key concepts of morality, behaviour & beliefs and diversity & i | nclu | ision | l | | |
| | | | | | | |
| Expected Course | e Outcome: | | | | | |
| 1. Integrate electro | onic/social media to share concepts and ideas | | | | | |
| 2. Acquire technic | al writing skills | | | | | |
| 3. Apply different | tools for quick reading. | | | | | |
| 4. Understand the | basic concepts of Morality and Diversity | | | | | |
| 5. Articulate opini | ons on a topic with the objective of influencing others | | | | | |
| 6. Demonstrate the | e basics of presentation and effective writing skills | | | | | |
| | | | | | | |
| Module:1 | Public Speaking and Presentation Skills | | | | 3 ho | ur |
| often confused. Module:2 | Lucid Writing | | | | 3 ho | |
| | udents to go through the links given about Catherine Morris and | Ioo | nio | | | |
| - | - Speed Reading session: Introduction to skimming and scanning; pra | | | | | <u> </u> |
| Module:3 | Communication Skills | | | | 3 ho | urs |
| Team work and he | ow individuals contribute- Belbin's 8 Team Roles and Lindgren's Big 5 | 5 pe | rson | ality | trait | s - |
| Belbin's 8 team pla | | 1 | | 2 | | |
| | | | | | | |
| Module:4 | Soft Skills | | | í | 3 ho | ur |
| Reviewing a book | a video, a film - Values and Life Skills: TCS values | | | | | |
| | | | | | | |
| Module:5 | Data Interpretation | | | | 2 ho | urs |
| Interpretation of | Data & Transcoding | | | | | |
| | | | | | | |
| Module: 6 | Contemporary Issues | | | | 1 h | oui |
| Guest lecture by | Industry Experts or R&D organization | | | | | |
| <u>y</u> | Total Lecture h | our | s: | 1 | 5 ho | urs |
| List of Challengi | ng Experiments (Indicative) | | 1 | | | |
| | al issues and Ethical values | | | | | |
| | Planning and Designing | | | | | |
| magazino.] | | | | | | |





| 3 | | | | | | | | |
|----|---|---------------------|--------------|-------------------------|----------------|--|--|--|
| 4 | | | | | | | | |
| 5 | Soft Skills : Discussion on social issues | | | | | | | |
| 6 | Presentation skills: Understanding diversity: PPT presentations | | | | | | | |
| 7 | Report Writing: Role of NGO: a visit to | the sight for a han | ds-on exp | erience and submit a | report | | | |
| 8 | Resume: Video resume | | | | | | | |
| | | | Tot | al Lecture hours: | 30 hours | | | |
| Te | xt Book(s) | | | | | | | |
| 1. | Raman, Meenakshi& Sangeeta Sharma. | Fechnical Commun | nication: Pr | rinciples and Practice, | , 3rd edition, | | | |
| | Oxford University Press, 2015. | | | | | | | |
| Re | ference Books | | | | | | | |
| 1. | Kalam, A.A. (2015). Guiding Souls: Dial | logues on the purp | ose of Life | .PrabhatPrakashan | | | | |
| 2. | Alred, G. J., Brusaw, C. T., &Oliu, W. E | . (2011). Handboo | k of Techn | ical Writing, Tenth E | Edition (10th | | | |
| | ed.). St. Martin's Press | | | | | | | |
| 3 | Sherman, Barbara.(2014).Skimming and | Scanning Techniqu | ues.Liberty | University Press. | | | | |
| Mo | ode of Evaluation: CAT / Assignment | / Quiz / FAT | | | | | | |
| Re | Recommended by Board of Studies 07-06-2019 | | | | | | | |
| Ap | proved by Academic Council | No. 55 | Date | 13-06-2019 | | | | |



| Course code | Course title | L | Т | Р | J | C |
|----------------------|--|--------|--------|-------------|-------|----|
| ENG 1017 | Business Communication & Value Science – III | 1 | 0 | 2 | 0 | 2 |
| Pre-requisite | NIL | S | yllab | us v | ersio | n |
| | | | V | .1.0 | | |
| Course Objective | s: | | | | | |
| 1. To develop tech | nical writing skills | | | | | |
| 2. To familiarize le | arners with Self-analysis techniques like SWOT & TOWS | | | | | |
| 3. To introduce str | udents to key concepts of Pluralism & cultural spaces, Cross-cultu | ral C | Com | nuni | catio | n |
| and Science of Na | tion building. | | | | | |
| | | | | | | |
| Expected Course | | | | | | |
| 1. Apply the basic | principles of SWOT & life positions. | | | | | |
| 2. Write effective s | entences by exposure to grammatical rules | | | | | |
| 3. Understand the o | concepts of Global, glocal and trans locational | | | | | |
| 4. Define and recog | gnize the importance of Artificial Intelligence | | | | | |
| - | s of technical writing | | | | | |
| 6. Exhibit understa | nding of diversity and cross-cultural communication | | | | | |
| | | | | | | |
| Module:1 | SWOT Vs. TOWS | | | | hou | rs |
| The Balancing Act | (Self Analysis) - Basic principles of SWOT & life positions. Ted talks | s on | biom | imic | ry | |
| | | | | | | |
| Module:2 | English Grammar & Vocabulary | | | 2 | hou | rs |
| Error Detection, V | oice (Active & passive) Text Completion (Closed/ open) | | | | | |
| | | | | | | |
| Module:3 | Pluralism in cultural spaces | | | 2 | hou | rs |
| Awareness and re | spect for pluralism in cultural spaces Theory/Discussion using Pl | nir N | /liley | ' Sur | Mei | a |
| Tumhara | | | | | | |
| | | | | | | |
| Module:4 | Global, Glocal and translocational cross-cultural communicat | ion | | 2 | hou | rs |
| Identify the com | mon mistakes made in cross-cultural communication. Verba | ıl aı | nd r | non-v | verba | 1 |
| communication (ap | pproach is through Ted and YouTube videos). | | | | | |
| | | | | | | |
| Module:5 | Technical Writing | | | 2 | hou | rs |
| | -Basic rules of Report writing through examples | | | | | |
| b) Technical Prop | osal - "How will a voice assistant evolve in 25 years from now?" | | | | | |
| | | | | | | |
| Module:6 | Motivation | | | | hou | rs |
| Maslow's theory - | Recognize how motivation helps real life - Leverage motivation in rea | al-lif | e sce | nario | S | |
| | | | | | | |
| | | | 1 | | | |
| Module:7 | Role of Science in nation building | | | 2 | hou | ſS |





B. Tech Computer Science and Engineering and Business Systems

Introduction to Role of science in nation building- Discussion through Augmented Reality, Role of science post- independence

| | lule:8 | Contemporary Issues | | | | 1 hour |
|-----|------------------|----------------------------------|---------------------|---------------|-----------------------|---------------|
| Gue | est lecture b | y Industry Experts or R&D or | rganization | | I | |
| | | | | Total | Lecture hours: | 15 hours |
| Lab | Experime | | | | | |
| 1 | | -Applying SWOT in real life | | our SWOT | | |
| 2 | - | / Skit -Global/Glocal/Transl | ocational culture | | | |
| 3 | Listening | -Motivational Talk | | | | |
| 4 | U | Importance of Artificial Intel | 0 | 0. | | |
| 5 | _ | & Summarizing - activity on ic | | | ivation /Maslow's T | heory |
| 6 | Speaking | -Cross Cultural Communicat | ion: PPT presentat | ions | | |
| 7 | Group Di | scussion - the role of scientist | ts and mathematici | ans from a | ncient India. | |
| 8 | Creative V | Writing (Poster Presentation) | -Gender awareness | campaign | | |
| | | | | To | tal Laboratory hou | rs: 30 hours |
| Tex | t Book(s) | | | | | I |
| 1. | | anjay and Pushp Lata. Englis | h Language and C | ommunica | tion Skills for Engir | eers, Oxford |
| | | y Press, India, 2018. | | | | |
| | erence Boo | | | | | |
| 1. | 0 | A. S., & O'Keefe, S. S. (2009) | | 0 | | Planning and |
| | - | echnical Content (3rd ed.). Sc | | | | |
| 2. | | J., Brusaw, C. T., &Oliu, W | 7. E. (2011). Hand | book of T | echnical Writing, I | enth Edition |
| | | . St. Martin's Press. | | | | |
| 3. | | S., Valentine, D., &Munter, | | | | ications (2nd |
| 4 | | Guide to Series in Business C | | | | (1 + 1 0010 |
| 4. | | & Tomalin, B. (2016). Cross | -Cultural Commu | nication: 1 | heory and Practice | (1st ed. 2013 |
| Wak | Reference | cave Macmillan. | | | | |
| | | | 1 | | | |
| 1 | - | of Technical Writing for Stud | | al muitina | | |
| 2 | - | eelance-writing.lovetoknow.c | com/kmas-technic | ai-writing | | |
| 2 | | lickhelp.com/clickhelp-techni | ool writing blog/1 | l daille of a | and tachnical wri | tor/ |
| 3 | - | ts and challenges of cultural di | | | i-good-teennical-will | 1017 |
| 5 | | ww.hult.edu/blog/benefits-cl | • | - | orknlace/ | |
| Onl | ine Resour | | lanenges-cultural-c | inversity-we | лкрасся | |
| 1 | | outu.be/CsaTslhSDI | | | | |
| 2 | 1 2 | youtube.com/watch?feature= | =voutu be&v=e80 | BbX05D7 | Y | |
| 2 | | youtube.com/watch?v=dT_I | | | | |
| 5 | | yourube.com/ waterr: v=u1_1 | | c-youtu.D | | |
| Mor | la of Fuely | ation: CAT / Assignment / | Ουίζ / ΕΔΤ | | | |
| | | by Board of Studies | 29-01-2021 | | | |
| | | Academic Council | No. 61 | Date | 18-02-2021 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| | Course Title | L | Т | Р | J | С |
|---|---|-----------------------|-------|--------|---|---|
| ENG1018 | Business Communication and Value Science - IV | 1 | 0 | 2 | 0 | 2 |
| Pre-requisite | NIL | | Sylla | bus | vers | ion |
| | | | | v. 1. | .0 | |
| Course Objectives: | | | | | | |
| 1. To recognize the b | best practices of communicative writing | | | | | |
| 2. To understand the | importance of emotional intelligence and diversity in personal and | d pr | rofes | siona | ıl liv | res |
| 3. To acquaint the le | arners on corporate etiquettes & corporate social responsibility | | | | | |
| Expected Course O | outcome: | | | | | |
| 4. Excel in communi | cative writing in real life scenarios. | | | | | |
| 5. Recognize the imp | portance of corporate social responsibility (CSR) | | | | | |
| 6. Assess the impact | of conflicts and list the basic guidelines required to manage confli | cts | | | | |
| | al Intelligence in personal and professional life. | | | | | |
| 8. Identify the best ti | me management practices and apply in diverse situations | | | | | |
| | nced level communication skills | | | | | |
| | | | | | | |
| Module:1 | Communicative Writing | | | | 2 | hour |
| | nunicative Writing, Formal and Business letters, Writing SOP | | | | | |
| 1 | | | | | | |
| | | | | | | |
| Module:2 | Corporate Social Responsibility (CSR) | | | | 2 | hour |
| | Corporate Social Responsibility (CSR) ory to introduce the concept of social responsibility. Attributes re | eau | ired | for w | | |
| Ubuntu story – A st | ory to introduce the concept of social responsibility. Attributes re | | | | vork | and |
| Ubuntu story – A st life Qualities of a g | ory to introduce the concept of social responsibility. Attributes report to introduce the concept of social responsibility, c) Strategic this | | | | vork | and |
| Ubuntu story – A st | ory to introduce the concept of social responsibility. Attributes report to introduce the concept of social responsibility, c) Strategic this | | | | vork | and |
| Ubuntu story – A st life Qualities of a g Decision making, e) | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts | | | | vork nnin | and g d) |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts | nki | ng & | z pla | vork nnin 2 | and g d) hour |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts | nki | ng & | z pla | vork nnin 2 | and g d) hour |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts | nki | ng & | z pla | vork nnin 2 | and g d) hour |
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| Ubuntu story – A straining life Qualities of a g Decision making, e) Module:3 Meaning and defining manage conflict Module:4 | ory to introduce the concept of social responsibility. Attributes re ood team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication | nkii ct o | ng & | r plan | vork nnin 2 t, Tij | and g d) hour ps to |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 4 Meaning and defini manage conflict Module:4 1 Business idioms and | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid | nkii ct o | ng & | r plan | vork nnin 2 t, Tij | and g d) hour ps to |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 4 Meaning and defini manage conflict Module:4 1 Business idioms and | ory to introduce the concept of social responsibility. Attributes re ood team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication | nkii ct o | ng & | r plan | vork nnin 2 t, Tij | and g d) hour ps to |
| Ubuntu story – A st life Qualities of a g Decision making, e) Module:3 4 Meaning and defini manage conflict Module:4 1 Business idioms and the TCS BizVocab o | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid | nkii ct o | ng & | r plan | vork nnin 2 z, Tij 2 zwnl | and g d) hour ps to |
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| Ubuntu story – A straining life Qualities of a g Decision making, e) Module:3 Meaning and defining manage conflict Module:4 Business idioms and the TCS BizVocab Module:5 | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic this Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid on their smartphones. | nkin ct o | ng & | r plan | vork nnin 2 z, Tij 2 zwnl | and g d) hour ps to hour oad |
| Ubuntu story – A straining and defining | ory to introduce the concept of social responsibility. Attributes re good team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid on their smartphones. Fime management ime Management Importance of Time Management for Better Life | nkin ct o | ng & | r plan | vork nnin 2 1 2 1 2 1 2 1 2 | and g d) hou ps to hou oad |
| Ubuntu story – A straining of a g Iife Qualities of a g Decision making, e) Module:3 Meaning and defining and defining and defining and defining and defining and get states idioms and the TCS BizVocab definition of the TCS BizVocab defi | ory to introduce the concept of social responsibility. Attributes re ood team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid on their smartphones. Fime management ime Management Importance of Time Management for Better Life Corporate Etiquette & Communication | nkii ct o de th | ng & | to de | vork nnin 2 2 3 2 7 2 7 2 7 2 7 | and g d) hour ps to hour oad hour |
| Ubuntu story – A straining and defining | ory to introduce the concept of social responsibility. Attributes re ood team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid on their smartphones. Fime management ime Management Importance of Time Management for Better Life Corporate Etiquette & Communication ette in business and everyday life, Components of Etiquette –Net | nkii ct o de th | ng & | to de | vork nnin 2 2 3 2 7 2 7 2 7 2 7 | and g d) houn ps to houn oad |
| Ubuntu story – A straining and defining | ory to introduce the concept of social responsibility. Attributes re ood team member: a) Resilience, b) Flexibility, c) Strategic thin Resolving conflicts Understanding conflicts tion of conflict; reasons for conflict; negative and positive impace Business Communication I corporate terms - handouts of common business idioms and guid on their smartphones. Fime management ime Management Importance of Time Management for Better Life Corporate Etiquette & Communication | nkii ct o de th | ng & | to de | vork nnin 2 2 3 2 7 2 7 2 7 2 7 | and g d) hour ps to hour oad hour |
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| Module 8 | Contemporary Issues | | | | 1 hour |
|-----------------------|---|---------------|-------------|--------------------------|------------------|
| Guest lecture by | Industry Experts or R&D organizat | ion | | L | |
| | | | Tota | l Lecture hours: | 15 hours |
| Lab Experim | ents: | | | I | |
| | g - CSR story & CSR activity of Ta | ata Steel N | licrosoft (| Google TCS Starbuck | s Titan Tata |
| Chemic | ls and TOMS Shoes | | | - | |
| 2 Speakin | g - Public speaking at work place an | nd best pra | ctices of p | oublic speaking/ Preser | nting a selected |
| speech b | y an eminent leader. | | | | |
| 3 Reading | - Cloze test on corporate etiquettes | 5 | | | |
| 4 Commu | nicative writing- drafting business | mails/ Org | anizing w | ork place events throug | gh mails |
| 5 Listenin | g - Case studies of Conflict resolut | | | | |
| | g - Conflict management- Presentang a pitch | tion skills | / Effectiv | e time management- e. | xtempore/ |
| 7 Reading | & summarizing - Time manageme | ent activitie | s : Time s | quared activity / Circad | dian Rhythm |
| | e Writing - Who am I? (Image Ma ss and social awareness through Na | | | a perfect image) / Explo | oring Self- |
| uttuitent | | | u j | Total Laboratory h | ours:30 hours |
| Fext Book(s) | | | | · | |
| · · · · | Meenakshi & Sangeeta Sharma. | Technical | Commun | vication. Principles an | d Practice 3rd |
| | Oxford University Press, 2015. | reenneur | Commu | neuron: i interpres un | a 1 factice, sta |
| Reference Bool | | | | | |
| | e, D. (2017). How to Develop Se ed.). Gallery Books | lf-Confide | ence and I | influence People by P | ublic Speaking |
| | ikrishna & Sunitha Mishra(2011) | . Commur | ication S | kills for Engineers, 2n | d edition, NY: |
| Pearson | | | | | |
| 3. Frantise | , Burda(2015). On Transcultural C | Communica | ation, LAF | P Lambert Academic Pu | ublishing, UK. |
| Web Reference | : | | | | |
| 1 https://v | ww.tata.com/about-us/tata-group | o-our-herit | age | | |
| | conomictimes.indiatimes.com/tata ticleshow/41766592.cms | a-success-s | story-is-ba | ased-on-humanity-phil | anthropy-and- |
| Online Resourc | 25: | | | | |
| 1 https://y | outu.be/reu8rzD6ZAE | | | | |
| 2 https:// | outu.be/Wx9v_J34Fyo | | | | |
| 3 https://y | outu.be/F2hc2FLOdhI | | | | |
| | outu.be/wHGqp8lz36c | | | | |
| 5 https://y | outu.be/hxS5He3KVEM | | | | |
| Mode of Eval | ation: CAT / Assignment / Qu | iz/FAT | | | |
| | by Board of Studies | 29-01-2 | 021 | | |
| Approved by A | cademic Council | No. 61 | Date | 18-02-2021 | |





| Course Code | Course Title | L | Т | Р | J | С |
|--|---|-------------------|--------|--------|-------|--------------|
| ENG1901 | Technical English - I | 0 | 0 | 4 | 0 | 2 |
| Pre-requisite | Foundation English-II | S | yllab | us V | ersi | on |
| | | | V | 7. 1.0 |) | |
| Course Objectives: | | | | | | |
| real life situation | nts' knowledge of grammar and vocabulary to read and write s. ents' practice the most common areas of written and spoken co | | | | | |
| 3. To improve stud- classroom. | ents' communicative competency through listening and spe | akinş | g acti | vitie | s in | the |
| Expected Course C | Putcome: | | | | | |
| Acquire wide voc. Comprehend lang Improve listening English accents the scademic as well a Module:1 Adv Articles, Tenses, Void Activity: Worksheets Module:2 Voc Idioms and Phrases, 1 | anderstanding of advanced grammar rules and write grammatica abulary and learn strategies for error-free communication. uage and improve speaking skills in academic and social contex g skills so as to understand complex business communication hrough proper pronunciation. agrams and improve both reading and writing skills which we as professional career. anced Grammar ce and Prepositions on Impersonal Passive Voice, Exercises from the prescribed ter abulary Building, I Homonyms, Homophones and Homographs les; Vocabulary Activities through Web tools | tts. in a ould | varie | them | f glo | bbal heir |
| | | | | | | |
| | ening for Specific Purposes | | | 4 | l hou | ırs |
| Gist, monologues, sh Activity: Gap filling; | ort conversations, announcements, briefings and discussions Interpretations | | | | | |
| Module:4 Spe | aking for Expression | | | 6 | hou | rs |
| Introducing oneself a Invitations | and others, Making Requests & responses, Inviting and Acce | pting | g/Dec | linir | ng | |
| Module:5 Rea | ding for Information | | | 4 | l hou | ırs |
| Reading Short Passag | es, News Articles, Technical Papers and Short Stories ecific news paper articles; blogs | | | | | |



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CURRICULUM (2022 - 2023)

| Module:6 | Writing Strategies | 4 hours |
|-----------------|---|------------------|
| Joining the se | ntences, word order, sequencing the ideas, introduction and conclusion | |
| Activity: Shor | t Paragraphs; Describing familiar events; story writing | |
| | | |
| Module:7 | Vocabulary Building II | 4 hours |
| Enrich the do | main specific vocabulary by describing Objects, Charts, Food, Sports and Em | ployment. |
| Activity: Des | cribing Objects, Charts, Food, Sports and Employment | |
| | | |
| Module:8 | Listening for Daily Life | 4 hours |
| Listening for a | statistical information, short extracts, Radio broadcasts and TV interviews | · |
| Activity: Taki | ng notes and Summarizing | |
| | | |
| Module:9 | Expressing Ideas and Opinions | 6 hours |
| - | nversations, Interpretation of Visuals and describing products and processes. | |
| Activity: Role | -Play (Telephonic); Describing Products and Processes | |
| | | |
| Module: 10 | Comprehensive Reading | 4 hours |
| • | prehension, making inferences, Reading Graphics, Note-making, and Critical | Reading. |
| Activity: Sent | ence Completion; Cloze Tests | |
| | | 1 |
| Module: 11 | Narration | 4 hours |
| U | ive short story, Personal milestones, official letters and E-mails. | |
| Activity: Writ | ing an E-mail; Improving vocabulary and writing skills. | |
| Module: 12 | Pronunciation | 4 h a mag |
| | | 4 hours |
| - | s, Word Stress, Intonation, Various accents ticing Pronunciation through web tools; Listening to various accents of Englis | h |
| Activity. Flac | icing Fronunciation through web tools, Eistenning to various accents of Englis | 11 |
| Module: 13 | Editing | 4 hours |
| | blex & Compound Sentences, Direct & Indirect Speech, Correction of Errors, | |
| | ticing Grammar | i unetuurons. |
| 5 | | |
| Module: 14 | Short Story Analysis | 4 hours |
| | y" by Jhumpa Lahiri | induis |
| | ling and analyzing the theme of the short story. | |
| | Total Lecture ho | urs 60 hours |
| | | |
| Text Book / | Workbook | |
| | P.C.; Martin, H.; Prasada Rao, N.D.V. (1973–2010). High School Englis | sh Grammar & |
| 1. Wren, 1 | | |
| | sition. New Delhi: Sultan Chand Publishers. | |
| Compos | sition. New Delhi: Sultan Chand Publishers. Sanjay, Pushp Latha. (2018) English Language and Communication Skills | s for Engineers. |



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| Refe | erence Books | | | | | |
|------|--|----------------|--|------------------|--|--|
| 1. | Guptha S C, (2012) Practical En | glish Gramm | ar & Composition, 1st Edition, | , India: Arihant | | |
| | Publishers | | | | | |
| 2. | Steven Brown, (2011) Dorolyn Smith, Active Listening 3, 3rd Edition, UK: Cambridge University Press. | | | | | |
| 3. | Liz Hamp-Lyons, Ben Heasley, (2010) Study Writing, 2nd Edition, UK: Cambridge University Press. | | | | | |
| 4. | Kenneth Anderson, Joan Maclean, (2013) Tony Lynch, Study Speaking, 2nd Edition, UK: | | | | | |
| | Cambridge, University Press. | (2013) Tony | Eynen, Study Speaking, 2nd Edi | | | |
| 5. | Eric H. Glendinning, Beverly Hol | mstrom, (2012 | 2) Study Reading, 2nd Edition, | UK: Cambridge | | |
| | University Press. | | | | | |
| 6. | Michael Swan, (2017) Practical En University Press. | glish Usage (P | ractical English Usage), 4th editi | on, UK: Oxford | | |
| 7. | Michael McCarthy, Felicity O'Del Edition), UK: Cambridge Universi | | lish Vocabulary in Use Advance | ed (South Asian | | |
| 8. | Michael Swan, Catherine Walter, Edition, UK: Oxford University Pr | | l English Grammar Course Adv | vanced, Feb, 4th | | |
| 9. | Watkins, Peter. (2018) Teaching Language teachers, UK: Cambridg | - | | Handbooks for | | |
| 10. | (The Boundary by Jhumpa Lahiri) | · | | | | |
| | https://www.newyorker.com/maga | | <u>29/the-boundary?intcid=inline_a</u> | mp | | |
| | | | | | | |
| Mod | le of evaluation: Quizzes, Presenta | tion, Discussi | on, Role play, Assignments and | l FAT | | |
| List | of Challenging Experiments (India | cative) | | | | |
| 1. | Self-Introduction | | | 12 hours | | |
| 2. | Sequencing Ideas and Writing a Para | graph | | 12 hours | | |
| 3. | Reading and Analyzing Technical Ar | ticles | | 8 hours | | |
| 4. | Listening for Specificity in Interview | s (Content Spe | cific) | 12 hours | | |
| 5. | Identifying Errors in a Sentence or F | aragraph | | 8 hours | | |
| 6. | Writing an E-mail by narrating life e | vents | | 8 hours | | |
| | | | Total Laboratory Hours | 60 hours | | |
| | | | | | | |
| | le of evaluation: Quizzes, Presenta | , | on, Kole play, Assignments and | 1 FAT | | |
| | ommended by Board of Studies | 0806-2019 | D-4 12.06 2010 | | | |
| Арр | roved by Academic Council | No. 55 | Date: 13-06-2019 | | | |



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CURRICULUM (2022 - 2023)

| Course Coo | le | Course Title L | .] | Γ | P | J | С |
|--|--|---|--------|------|---|-----------------------|----------------|
| ENG1902 | | Technical English - II 0 |) (| 0 | 4 | 0 | 2 |
| Pre-requisi | te | 71% to 90% EPT score S | yllal | bus | s Ve | ersio | n |
| | | | | V | . 1. | 0 | |
| Course Obj | ectives: | | | | | | |
| 1. To acqu | ire proficien | ncy levels in LSRW skills on par with the requirements for place | ceme | enti | inte | rviev | /s o |
| high-en | d companie | es / competitive exams. | | | | | |
| 2. To eval | uate compl | ex arguments and to articulate their own positions on a range | ge o | of | tech | nnical | and |
| general | topics. | | | | | | |
| 3. To spea | k in gramn | natical and acceptable English with minimal MTI, as well as | dev | velo | op a | a vast | an |
| active v | ocabulary. | | | | | | |
| | | | | | | | |
| Expected C | | | | | | | |
| | - | ciently in high-end interviews and exam situations and all social | l situ | uati | ions | 5 | |
| 2. Compre | hend acade | nic articles and draw inferences | | | | | |
| 3. Evaluate | e different p | erspectives on a topic | | | | | |
| 4. Write cl | early and co | nvincingly in academic as well as general contexts | | | | | |
| 5. Synthes | ize complex | concepts and present them in speech and writing | | | | | |
| | ize complex | concepts and present them in speech and writing | | | | | |
| | | concepts and present them in speech and writing | | | | | |
| Module:1 | | for Clear Pronunciation | | | 4 | hou | rs |
| | Listening | | versa | atio | | | |
| Ice-breaking, | Listening Introductio | for Clear Pronunciation | versa | atio | | | |
| Ice-breaking, and America | Listening Introduction accents (| for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv | | | | | |
| Ice-breaking, and America Activity: Fac | Listening Introduction In accents (tual and inte | for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac | | | | | |
| Ice-breaking, and America Activity: Fac Module:2 | Listening Introduction In accents (tual and inter Introduc | for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself | | | ons : | | itisl |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In | Listening Introduction In accents (tual and inte Introduction dividual Pre | for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations | | | ons : | in Br | itisl |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In | Listening Introduction In accents (tual and inte Introduction dividual Pre | for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself | | | ons : | in Br | itisl |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel | Listening Introduction In accents (tual and inter Introduction f-Introduction | for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech | | | ons : 4 | in Br | itisl |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 | Listening Introduction accents (tual and inter Introduction f-Introduction Effective | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing</pre> | | | ons : 4 | in Br | itisl |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus | Listening Introduction in accents (tual and inter Introduction dividual Present f-Introduction Effective iness letters | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing and Emails, Minutes and Memos</pre> | | | 0ns = 4 | in Br | rs rs |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus Structure/ te | Listening Introduction accents (tual and inter Introduction dividual Pre f-Introduction Effective iness letters mplate of c | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing</pre> | | | 0ns = 4 | in Br | rs rs |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus Structure/ te of Minutes a | Listening Introduction accents (tual and inter Introduction dividual Present f-Introduction Effective iness letters mplate of c and Memos | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placing</pre> | | | 0ns = 4 | in Br | rs rs |
| and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus Structure/ te of Minutes a | Listening Introduction accents (tual and inter Introduction dividual Present f-Introduction Effective iness letters mplate of c and Memos | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing and Emails, Minutes and Memos</pre> | | | 0ns = 4 | in Br | rs rs |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus Structure/ te of Minutes a Activity: Stu | Listening Introduction in accents (tual and inter- Introduction dividual Pre- f-Introduction Effective iness letters inplate of c and Memos dents write | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placing a business letter and Minutes/ Memo</pre> | | | ens : 4 6 | in Br hou ;Forr | rs rs |
| Ice-breaking, and America Activity: Fac Module:2 Speaking: In Activity: Sel Module:3 Writing: Bus Structure/ te of Minutes a Activity: Stu Module:4 | Listening Introduction in accents (tual and inter- Introduction dividual Pre- f-Introduction Effective iness letters inglate of c and Memos dents write Compre | <pre>g for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BBC and CNN) as well as other 'native' accents erpretive exercises; note-making in a variety of global English ac ing Oneself sentations ons, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placing a business letter and Minutes/ Memo hensive Reading</pre> | g an | | ens : 4 6 der 4 | in Br hou ;Forr | rs rs |
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| | Reading: Rea Activity: Cla Module:10 Writing: Ima Activity: Writing: Ima Activity: Writing: Ima Activity: Writing: Ima Activity: Cla Module:12 Narratives o Activity: Cla Module:13 Writing: Tec Module:14 | ading short stories ading short stories assroom discussion and Creative Writing aginative, narrative an iting about personal ex Academic Listeni istening in academic c tening to lectures, Aca ew Meetings Reading Nature-H on Climate Change, N ssroom discussions, st Technical Proposals chnical Proposals Acti Presentation Skills | d note-making, critical appreciation of the short story nd descriptive prose experiences, unforgettable incidents, travelogues ing contexts ademic Discussions, Debates, Review Presentations, Res based Narratives Vature and Environment student presentations sals ivities: Writing a technical proposal | 4 hours 4 hours 4 hours 4 hours 4 hours 4 hours |



VIIT⁸⁹ Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

| Tota | l Lecture hours: 60 hours |
|--|--------------------------------|
| Text Book / Workbook | |
| 1. Oxenden, Clive and Christina Latham-Koenig. New English File: Ad | vanced Students Book. |
| Paperback. Oxford University Press, UK, 2017. | |
| 2. Rizvi, Ashraf. Effective Technical Communication. McGraw-Hill India | , 2017. |
| Reference Books | |
| Oxenden, Clive and Christina Latham-Koenig, New English File: with Test and Assessment. CD-ROM: Six-level General English Control University Press, UK, 2013. | |
| 2. Balasubramanian, T. English Phonetics for the Indian Stude Publications, 2016. | ents: A Workbook. Laxmi |
| 3. Philip Seargeant and Bill Greenwell, From Language to Cree Academic, 2013. | eative Writing. Bloomsbury |
| 4. Krishnaswamy, N. Eco-English. Bloomsbury India, 2015. | |
| 5. Manto, Saadat Hasan. Selected Short Stories. Trans. Aatish Taseer. R | andom House India, 2012. |
| 6. Ghosh, Amitav. The Hungry Tide. Harper Collins, 2016. | |
| 7. Ghosh, Amitav. The Great Derangement: Climate Change and Books, 2016. | the Unthinkable. Penguin |
| 8. The MLA Handbook for Writers of Research Papers, 8th Edition. 2016 | б. |
| Online Sources: | |
| https://americanliterature.com/short-short-stories. (75 short short stories) | |
| http://www.eco-ction.org/dt/thinking.html (Leopold, Aldo."Thinking like a M | Mountain") |
| /www.esl-lab.com/; www.bbc.co.uk/learningenglish/; | |
| /www.bbc.com/news; | |
| /learningenglish.voanews.com/a/using-voa-learning-english-to-improve-listen | ing <u>skills/3815547.html</u> |
| | |
| Mode of evaluation: Quizzes, Presentation, Discussion, Role play, Assi | gnments and FAT |
| List of Challenging Experiments (Indicative) | |
| 1. Self-Introduction using SWOT | 12 hours |
| 2. Writing minutes of meetings | 10 hours |
| 3. Writing an abstract | 10 hours |
| 4. Listening to motivational speeches and interpretation | 10 hours |
| 5. Cloze Test | 6 hours |
| 6. Writing a proposal | 12 hours |
| Total Laborat | tory Hours 60 hours |
| | |
| Mode of evaluation: Quizzes, Presentation, Discussion, Role play, Assi | gnments and FAT |
| Recommended by Board of Studies 08-06-2019 | |
| Approved by Academic CouncilNo. 55Date: 13-06-20 | 110 |
| Approved by Academic Council 190, 55 Date: 15-00-20 | 11/ |



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CURRICULUM (2022 - 2023)

| Course Code | | | L | T | P | J | C |
|---|--|---|--------|----------|-------|---|----------------------|
| ENG1903 | | | 0 | 0 | 2 | 4 | 2 |
| Pre-requisite | | Greater than 90 % EPT score | S | | ous V | | ion |
| | | | | ١ | v.1.0 | | |
| Course Objecti | | | | | | | |
| | | re in any form or any technical article | | | | | |
| | | n social media and respond accordingly | | | | | |
| | | with people across the globe overcoming trans-cultural ba | rrie | rs ai | nd no | egoti | ate |
| successful | Iy | | | | | | |
| Expected Co | nurse | Autcome: | | | | | |
| - | | and write good reviews | | | | | |
| • | • | n papers, project proposals and reports | | | | | |
| | | ectively in a trans-cultural environment | | | | | |
| | | l teams towards success | | | | | |
| - | | n effective manner using web tools | | | | | |
| | | ~ | | | | | |
| Module:1 | Nego | otiation and Decision-Making Skills through Literary Analy | vsis | | | 5 ho | ur |
| | 0 | n and Decision-Making Skills | | | | | |
| 1 1 | | xcerpts from Shakespeare's "The Merchant of Venice" (court sc | cene | ane) and | d dis | cuss | ioi |
| on negotiation | | | | / | | | |
| U U | | xcerpts from Shakespeare's "Hamlet" (Monologue by Hamlet) a | nd d | liscu | ssior | non | |
| | | Recipits from onakespeare s' franner (monorogue by franner) a | nu c | inseu | 55101 | ion | |
| decision making | ckille | | | | | | |
| | | ing reviews and abstracts through movie interpretations | | | 5 | how | rc. |
| decision making Module:2 | Writ | ing reviews and abstracts through movie interpretations | | | 5 | hou | rs |
| Module:2 Review writing | Writ | stract writing with competency | | | 5 | hou | rs |
| Module:2 Review writing Activity: Watch | Writ and abs ing Cha | stract writing with competency arles Dickens "Great Expectations" and writing a movie review | | | | | |
| Module:2 Review writing Activity: Watch Watching Willia | Writz and abs ing Cha am F. N | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s | scen | ario | | | |
| Module:2 Review writing Activity: Watch Watching Willia of resources an | Writ and abs ing Cha am F. N d writir | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s ng an abstract | scen | ario | of de | eplet | ioı |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 | Writ and abs ing Cha am F. N d writir Tech | stract writing with competency arles Dickens "Great Expectations" and writing a movie review folan's "Logan's Run" and analyzing it in tune with the present s ing an abstract anical Writing | scen | ario | of de | | ioı |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect | Writ and abs ing Cha am F. N d writir Tech ive ling | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract inical Writing uistics for writing: content and style | scen | ario | of de | eplet | io |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof | Writ and abs ing Cha am F. N d writir Tech ive ling reading | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose | scen | ario | of de | eplet <mark>4 ho</mark> | ioı ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose is-Cultural Communication | scen | ario | of de | eplet | ioı ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Tra | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu | stract writing with competency arles Dickens "Great Expectations" and writing a movie review Iolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose | | | of de | eplet 4 ho 1 ho | ioı ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Tra Activity: Group | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss | stract writing with competency arles Dickens "Great Expectations" and writing a movie review folan's "Logan's Run" and analyzing it in tune with the present s ing an abstract inical Writing uistics for writing: content and style s, Statement of Purpose is-Cultural Communication and communication | | | of de | eplet 4 ho 1 ho | ioı ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Trat Activity: Group communication | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss | stract writing with competency arles Dickens "Great Expectations" and writing a movie review folan's "Logan's Run" and analyzing it in tune with the present s ing an abstract inical Writing uistics for writing: content and style s, Statement of Purpose is-Cultural Communication and communication | | | of de | eplet 4 ho 1 ho | io ur |
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| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Prooff Module:4 Nuances of Trat Activity: Group communication Module:5 Enhancing repo | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss a. Repo | stract writing with competency arles Dickens "Great Expectations" and writing a movie review lolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract inical Writing uistics for writing: content and style s, Statement of Purpose is-Cultural Communication and case studies on trans-cultural communication. Debate on ort Writing and Content Writing | n trai | ns-cı | of do | eplet 4 ho 4 ho al 4 ho | ion ur ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Trai Activity: Group communication Module:5 Enhancing repo Activity: Watch | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss a. Repo | stract writing with competency arles Dickens "Great Expectations" and writing a movie review lolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose s-Cultural Communication ural communication sion and case studies on trans-cultural communication. Debate on ort Writing and Content Writing n relevant audio-visuals | n trai | ns-cı | of do | eplet 4 ho 4 ho al 4 ho | ion ur ur |
| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Prooff Module:4 Nuances of Trat Activity: Group communication Module:5 Enhancing repo | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss t. Repo rtage or a docus | stract writing with competency arles Dickens "Great Expectations" and writing a movie review lolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose s-Cultural Communication ural communication sion and case studies on trans-cultural communication. Debate on ort Writing and Content Writing n relevant audio-visuals | n trai | ns-cı | of do | eplet 4 ho 4 ho al 4 ho | ior ur ur |
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| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Tra Activity: Group communication Module:5 Enhancing repo Activity: Watch interpret Module:6 Dynamics of dra Activity: Writin | Writ and abs ing Cha am F. N d writin Tech ive ling reading reading ms-cultu discuss t. Repo rtage or a docus discuss | stract writing with competency arles Dickens "Great Expectations" and writing a movie review lolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract mical Writing uistics for writing: content and style s, Statement of Purpose s-Cultural Communication rral communication sion and case studies on trans-cultural communication. Debate on ort Writing and Content Writing in relevant audio-visuals mentary on social issues and draft a report, Identify a video on ar ting project proposals and article writing roject proposals and research articles ect proposal. Writing a research article. | n trai | ns-cı | of do | eplet 4 ho 4 ho 4 ho e an 4 ho | ior ur ur d |
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| Module:2 Review writing Activity: Watch Watching Willia of resources an Module:3 Stimulate effect Activity: Proof Module:4 Nuances of Tra Activity: Group communication Module:5 Enhancing repo Activity: Watch interpret Module:6 Dynamics of dra Activity: Writin Module:7 Build smart pres | Writ and abs ing Cha am F. N d writir Tech ive ling reading Tran ns-cultu discuss t. Repo rtage or a docus discuss t. Draft afting p g a proj Sentation | stract writing with competency arles Dickens "Great Expectations" and writing a movie review lolan's "Logan's Run" and analyzing it in tune with the present s ing an abstract unical Writing uistics for writing: content and style s, Statement of Purpose is-Cultural Communication ral communication sion and case studies on trans-cultural communication. Debate on ort Writing and Content Writing n relevant audio-visuals mentary on social issues and draft a report, Identify a video on ar ting project proposals and article writing roject proposals and research articles ect proposal. Writing a research article. mical Presentations | n tran | ns-cı | of do | eplet 4 ho 4 ho 4 ho e an 4 ho | ion ur ur d |





| 3^{rd} editiReference Boo1.Basu B.2.ArathooPublishe3.Kumar,Universe4.Frantise5.Geever,2012 TI6.Young,KindleZo11.7.Ray, Ra8.C Mura2011.Universe1.Enacting2.Watchir3.Trans-cu4.Drafting5.Technic6.Writing1.Short Fi | on, Oxford University Press ks N. Technical Writing, 2011 K n, Anita. Shakespeare's T rs, 2015. Sanjay and Pushp Lata. Engl ty Press, India, 2018. c, Burda. On Transcultural C C. Jane. The Foundation C e Foundation Center, USA Milena. Hacking Your States Edition. ri, William Shakespeare's Ha | s, 2015. <u>Kindle edition</u> The Merchant lish Language = <u>Communication</u> Center's Guide <u>ment of Purpos</u> | of Venice (Text with Paraphrase) and Communication Skills for Engin , 2015, LAP Lambert AcademicPubl to Proposal Writing, 5 th Edition, 2 se: A Concise Guide to Writing You |), Evergreen eers, Oxford ishing, UK. 2007, Reprint |
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| List of Challe1.Enacting2.Watchir3.Trans-cu4.Drafting5.Technic6.WritingJ- Component1.Short Fi2.Field Vi3.Case stu4.Writing | | | n Skills for Engineers, 2 nd edition, N | VY: Pearson, |
| 1.Enacting2.Watchir3.Trans-cu4.Drafting5.Technic6.WritingJ- Component1.Short Fi2.Field Vi3.Case stu4.Writing | | | on, Role Play, Assignments | |
| Watchir Trans-cr Drafting Technic Technic Writing Component Short Fi Field Vi Case stu Writing | nging Experiments (Indica | ative) | | |
| Trans-cu Drafting Technic Writing Writing Short Fi Field Vi Case stu Writing | a court scene – Speaking | | | 6 hours |
| 4. Drafting 5. Technic 6. Writing J- Component 1. Short Fi 2. Field Vi 3. Case stu 4. Writing | g a movie and writing a revie | ew | | 4 hours |
| 5.Technic6.WritingJ- Component1.Short Fi2.Field Vi3.Case stu4.Writing | ltural – case studies | | | 2 hours |
| 6.WritingJ- Component1.Short Fi2.Field Vi3.Case stu4.Writing | a report on any social issue | | | 6 hours |
| J- Component1.Short Fi2.Field Vi3.Case stu4.Writing | l Presentation using web too | ols | | 6 hours |
| 1.Short Fi2.Field Vi3.Case stu4.Writing | a research paper | | | 6 hours |
| 2.Field Vi3.Case stu4.Writing | Sample Projects | | | |
| 3.Case stu4.Writing | ms | | | |
| 4. Writing | sits and Reporting | | | _ |
| 4. Writing | dies | | | |
| 5. Vloggir | ologs | | | - |
| | g | | | |
| | | | Total Hours (J-Component) | 60 hours |
| | ation: Quizzes, Presentati | , | n, Role play, Assignments and FA | Т |
| Recommende Approved by | | 08.06.2019 No. 55 | Date: 13-06-2019 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | | Course Title I | | P | J | С |
|---|---|--|---------|---------------|--|--|
| HUM1021 | | ETHICS AND VALUES 2 | - | 0 | 0 | 2 |
| Pre-requisite | 9 | NIL | Syllab | | rsi | on |
| | | | ١ | v. 1.1 | | |
| Course Objec | | | | | | |
| | - | preciate the ethical issues faced by an individual in profession, so | ciety a | and p | olit | У |
| | - | gative health impacts of certain unhealthy behaviors | | | | |
| 3. To apprecia | te the nee | d and importance of physical, emotional health and social health | | | | |
| Expected Cour | rsa Auteo | me: Students will be able to: | | | | |
| _ | | s and ethical values scrupulously to prove as good citizens | | | | |
| | | social problems and learn to act ethically | | | | |
| | | ept of addiction and how it will affect the physical and mental hear | alth | | | |
| | | cerns in research and intellectual contexts, including academic | | ritv | use | and |
| - | | he objective presentation of data, and the treatment of human su | - | - | use | unc |
| | | ologies, characteristics, activities, actors and forms of cybercrime | - | 3 | | |
| 4. Identify the | e main typ | orogies, characteristics, activities, actors and forms of cyberennic | | | | |
| Module:1 | Being | Good and Responsible | | | <u>5 h</u> | our |
| | 5 | is truth and non-violence – Comparative analysis on leaders of | nost | | | |
| serving the so | | s self-interests - Personal Social Responsibility: Helping the n | iccuy, | Charl | ly | and |
| serving the soc | ciety | | | | | |
| Module:2 | ciety Social | Issues 1 | | | | |
| Module:2 | ciety Social | | | | | |
| Module:2 Harassment – | ciety Social Types - P | Issues 1 | | | 4 h | our |
| Module:2 Harassment – Module:3 | ciety Social Types - P Social | Issues 1 revention of harassment, Violence and Terrorism Issues 2 | | | 4 h 4 h | our |
| Module:2 Harassment – Module:3 | ciety Social Types - P Social thical valu | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Wh | | | 4 h 4 h | our |
| Module:2 Harassment – Module:3 Corruption: Et Tax evasions - | ciety Social Types - P Social thical valu – Unfair tr | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices | | llar c | 4 h 4 h erim | our |
| Module:2 Harassment – Module:3 Corruption: E Tax evasions - Module:4 | ciety Social Types - P Social thical valu – Unfair tr Addic | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Wh ade practices tion and Health | hite co | llar c | 4 h 4 h erim 5 h | our our les |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff | hite co | ollar c | 4 h 4 h 6 h 5 h 0 ki | our our les our ng |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions – Module:4 Peer pressure Prevention of | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Wh ade practices tion and Health | hite co | ollar c | 4 h 4 h 6 h 5 h 0 ki | our our les our ng |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff | hite co | ollar c | 4 h 4 h 6 rim 5 h oki | our our les · our ng · |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure Prevention of Transmitted D Module:5 | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides Diseases | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff; Sexual Health: Prevention and impact of pre-marital pregna Abuse | hite co | ollar c | 4 h 4 h 7 rin 5 h 0 ki exu 3 h | our our les - our ng - ially |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure Prevention of Transmitted D Module:5 | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides Diseases | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff; Sexual Health: Prevention and impact of pre-marital pregnation | hite co | ollar c | 4 h 4 h 7 rin 5 h 0 ki exu 3 h | our our les - our ng - ially |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure Prevention of Transmitted D Module:5 | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides Diseases Diseases | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff; Sexual Health: Prevention and impact of pre-marital pregna Abuse | hite co | of sm nd S | $\frac{4 h}{4 h}$ | our our les - our ng - ially our |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure Prevention of Transmitted D Module:5 Abuse of diffe Module:6 | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides Diseases Drug erent types Perso | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff; ; Sexual Health: Prevention and impact of pre-marital pregnation Abuse of legal and illegal drugs: Ethical values, causes, impact, laws and nal and Professional Ethics | hite co | of sm nd S | $\frac{4 h}{4 h}$ | our our les - our ng - |
| Module:2 Harassment – Module:3 Corruption: En Tax evasions - Module:4 Peer pressure Prevention of Transmitted D Module:5 Abuse of diffe Module:6 | ciety Social Types - P Social thical valu – Unfair tr Addic - Alcoho f Suicides Diseases Drug erent types Perso | Issues 1 revention of harassment, Violence and Terrorism Issues 2 es, causes, impact, laws, prevention – Electoral malpractices; Whade practices tion and Health lism: Ethical values, causes, impact, laws, prevention – Ill eff; Sexual Health: Prevention and impact of pre-marital pregna Abuse of legal and illegal drugs: Ethical values, causes, impact, laws and | hite co | of sm nd S | $\frac{4 h}{4 h}$ | our our les our ng ially our |





| Mo | dule:8 | Contemporary issues: G | uest lectures by Ex | perts | | 2 hours |
|-----|-------------|-------------------------------|-----------------------|--------------|-------------------|----------------|
| | | Total | Lecture hours: | | 30 ho u | ırs |
| | | | | | | |
| Ref | erence Boo | oks | | | | |
| 1. | Dhaliwal, | K.K, "Gandhian Philoso | ophy of Ethics: A | A Study | of Relationship | between his |
| | Presuppos | ition and Precepts, 2016, Wr | iters Choice, New I | Delhi, India | 1. | |
| 2. | Vittal, N, | "Ending Corruption? - How | to Clean up India?", | , 2012, Per | nguin Publishers, | UK. Pagliaro, |
| 3. | L.A. and | Pagliaro, A.M, "Handboo | k of Child and A | Adolescen | t Drug and Sul | ostance Abuse: |
| | Pharmaco | logical, Developmental and C | Clinical Consideratio | ons", 2012, | Wiley Publishers | , U.S.A. |
| | Pandey, P | . K(2012), "Sexual Harassme | ent and Law in India | ı", 2012, L | ambert Publishers | s, Germany. |
| | | · | | | | |
| Mo | de of Evalu | ation: CAT, Assignment, | Quiz, FAT and Se | minar | | |
| | | d by Board of Studies | 26-07-2017 | | | |
| | | v | l | | | |





| Course code | Course Title | L | T | P J | C |
|------------------------------|---|---------|--------|--------------|-------|
| MAT 1017 | Probability and Statistics | 3 | 0 | 0 0 | 3 |
| Pre-requisite | NIL | Syl | labu | s versi | on |
| | | | v | 7. 1.0 | |
| Course Objectives: | | | | | |
| - | lents with a framework that will help them choose the appropriate | e desc | riptiv | ve meth | ods |
| | analysis situations. | | | | |
| | ibutions and relationships of real-time data. | | c | | |
| 3. To apply estim making. | ation and testing methods to make inference and modeling tec | chniqu | ies fo | or decis | sion |
| | | | | | |
| | Dutcome: At the end of this course the students are expected to | | | | |
| | tanding of the probability concepts. | | | | |
| • 1 | blems connected with statistics. | | | | |
| | w to make the transition from a real problem to a probability mod | lel for | that | proble | m. |
| 4. Expose students | s to practical applications. | | | | |
| Module:1 | Probability | | | 6 h/ | ours |
| | Probability: ments, sample space, event. Definition of combinatorial pro | hahili | ty (| | |
| probability, Bayes T | | Uaum | ty. C | Jonann | onai |
| probability, Dayes 1 | | | | | |
| Module:2 | Random Variables: | | | 6 ha | ours |
| | robability distributions: Discrete & continuous distributions, Mat | hemat | ical e | | |
| | Ioments (including variance) and their properties, interpretation | | | | |
| function. | | , - | | 0 | 0 |
| | | | | | |
| Module:3 | Distributions: | | | 8 h o | ours |
| | and Geometric distributions, Uniform, Exponential, Norma | ıl, Ch | ni-squ | uare, t | , F |
| distributions. | | | | | |
| Module:4 | Statistics: | | | 6 h(| ours |
| | cs, Basic objectives, Applications in various branches of science w | vith ex | amnl | | Juis |
| | Internal and external data, Primary and secondary data. | | umpi | | |
| | ble, Representative sample. | | | | |
| 1 1 | | | | | |
| Module:5 | Data Analysis: | | | 5 ho | ours |
| Classification and tal | bulation of univariate data, graphical representation, Frequency cu | rves. | | | |
| | | | | | |
| | Descriptive Measures: | | | | ours |
| | es - central tendency and dispersion. Bivariate data. Summari | zatio | n, ma | arginal | and |
| conditional frequenc | y distribution. | | | | |
| Modulo.7 | Coloubus | | | 7 ե | |
| | Calculus: | 0.00001 | | / 10 | ours |
| basic concepts of Di | fferential and integral calculus, application of double and triple int | egral. | | | |
| Module:8 | Expert Lecture | | | 2 h/ | ours |
| | Total Lecture | nire. | | 45 h | |
| | | 5ul 3. | | -13 110 | JUI 3 |
| | | | | | |
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| Tex | xt Books | | | |
|-----|---|-------------------|--------------|-------------------------------|
| 1. | Introduction of Probability Models, S. M. Ross | s, Academic Pre | ss, N.Y. | |
| 2. | Fundamentals of Statistics, vol. I & II, A. Good | on, M. Gupta and | l B. Dasgu | pta, World Press. |
| 3 | Higher Engineering Mathematics, B. S. Grewa | al, Khanna Publi | cation, Del | hi. |
| Ref | ference Books | | | |
| 1. | A first course in Probability, S. M. Ross, Prenti | tice Hall. | | |
| 2. | Probability and Statistics for Engineers, (For | urth Edition), I. | R. Miller, | , J.E. Freund and R. Johnson, |
| | PHI. | | | |
| 3 | Introduction to the Theory of Statistics, A. I | M. Mood, F.A. | Graybill a | and D.C. Boes, McGraw Hill |
| | Education. | | | |
| 4 | Advanced Engineering Mathematics, (Seventh | n Edition), Peter | V. O'Neil, | Thomson Learning. |
| 5 | Advanced Engineering Mathematics, (Second | Edition) M. D. | Greenberg | , Pearson Education. |
| 6 | Applied Mathematics, Vol. I & II, P. N. Wartil | kar and J. N. Wa | artikar, Vid | yarthiPrakashan. |
| | | | | |
| | ode of Evaluation: Assignments, Quiz, Continuou | , | Seminar a | nd Final assessment test |
| | | 6-02-2019 | | |
| App | proved by Academic Council N | No.56 | Date | 24-09-2019 |





| | ode | Course Title | L | Т | P | J | C |
|---|--|---|---|------------------------------|----------------------|--|--|
| MGT20 |)01 | Introduction To Innovation, Ip Management & | 3 | 0 | 0 | 0 | 3 |
| | | Entrepreneurship | | | | | |
| Pre-requisit | te | NIL | | Sylla | bus | versi | ion |
| | | | | | v. 1 | .0 | |
| Course Obj | ectives: | | | | | | |
| 1. Appreciate | e innova | ion as core business process, and ability to apply it to the grow | wth | of an | orga | nizat | ion. |
| 2. Recognize | the role | of entrepreneurship in giving the organization a sustainable co | omp | etitiv | e adv | vanta | ge. |
| 3. Awareness | s of the o | oncept and types of Intellectual Property Rights and their pro- | otecti | on | | | |
| | | | | | | | |
| Expected C | ourse O | utcome: | | | | | |
| 1. Understan | d the co | ncept and need for innovation in an organization. | | | | | |
| 2. Appreciat | e how e | ntrepreneurs can add value to an organization, and give it a | sust | aina | ble c | ompo | etitive |
| advantage. | | | | | | | |
| 3. Know the | concept | of IPR, their different types, and how to protect them. | | | | | |
| | • | | | | | | |
| Module:1 | | luction on Innovation | | | | | hour |
| Innovation as | s a core | business process, Sources of innovation, Knowledge push vs. | need | l pull | inno | ovatio | ons. |
| | - | | | | | | |
| | | | | | | • | hours |
| Module:2 | | ng an Innovative Organization | | | | | |
| Creating new | v produ | ts and services, exploiting open innovation and collaboration | on, u | se of | f inn | | |
| Creating new starting a new | v produo w ventu | ts and services, exploiting open innovation and collaboration | | se of | finn | | |
| Creating new starting a new | v produo w ventu | ts and services, exploiting open innovation and collaboration | | se of | finn | | |
| Creating new starting a ne Class Discus | v produc w ventu sion- Ini | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro | | se of | f inn | ovati | on foi |
| Creating new starting a ne Class Discus Module:3 | w produce w ventu sion- Inn Entre | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship | ach | | | ovati | on for hours |
| Creating new starting a ne Class Discus Module:3 Opportunity | v produce w ventu sion- Inn Entre recogni | tts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M | ach | | | ovati | on for hours |
| Creating new starting a ne Class Discus Module:3 Opportunity | v produce w ventu sion- Inn Entre recogni | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship | ach | | | ovati | on for hours |
| Creating new starting a ner Class Discus Module:3 Opportunity Competitive | v produce w ventu sion- Inn Entre recogni Advant | tts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of Mage- Use of IPR to protect Innovation | ach | | | ovati 5 /laint | on for hour aining |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 | v produce w ventu sion- Inn Entre recogni Advant | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of Mage- Use of IPR to protect Innovation preneurship- Financial Planning | ach Iana | geme | ent-N | ovati 5 Aaint 5 | on for hours aining hours |
| Creating new starting a new Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr | v produce w ventu sion- Inn Entre recogni Advant | tts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of Mage- Use of IPR to protect Innovation | ach Iana | geme | ent-N | ovati 5 Aaint 5 | on for hours aining hours |
| Creating new starting a new Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr | v produce w ventu sion- Inn Entre recogni Advant | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of Mage- Use of IPR to protect Innovation preneurship- Financial Planning | ach Iana | geme | ent-N | ovati 5 Aaint 5 | on for hours aining hours |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing | v produce w ventu sion- Inn Entre recogni Advant Entre rojection | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap | ach Iana | geme | ent-N | ovati 5 Aaint 5 er for | on for hour aining hour ms o |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 | v produce w ventu sion- Inn Entre recogni Advant Entre rojection | tts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) | lana, | geme | ent-N othe | ovati 5 Aaint 5 er for 4 | on for hours aining ms of hours |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 Introduction | v produce w ventu sion- Inn Entre Advant Entre ojection and the | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp | aach Iana Dital | geme and | othe | ovation 5 Maint 5 er for 4 in Ir | on for hours aining ms or hours |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 Introduction | v produce w ventu sion- Inn Entre Advant Entre ojection and the | tts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) | aach Iana Dital | geme and | othe | ovation 5 Maint 5 er for 4 in Ir | on for hours aining hours hours |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 Introduction Genesis and | v produce w ventu sion- Inn Entre recogni Advant Entre ojection and the Develop | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of Mage- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp ment - International Context - Concept of IP Management, U | aach Iana Dital | geme and | othe | ovation 5 Maint 5 er for 4 in Ir ng. | on for hour aining hour ms o hour ndia - |
| Creating new starting a ner Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 Introduction Genesis and Module:6 | v produce w ventu sion- Inn Entre recogni Advant Entre rojection Essen and the Develop | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp ment - International Context - Concept of IP Management, U s of Intellectual Property | ach Iana, Dital | geme and /e - | othe | ovation 5 Aaint 5 er for 4 in Ir ng. 4 | on fo: hour aining hour ms o hour hour |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financial Pr Financing Module:5 Introduction Genesis and Module:6 Patent- Proc | v produce w ventu sion- Inn Entre recogni Advant Entre ojection and the Develop Type edure, I | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp ment - International Context - Concept of IP Management, U s of Intellectual Property icensing and Assignment, Infringement and Penalty- Trader | ach Iana Dital ectiv Gse ir marl | geme and /e - n man | othe IPR ketin | ovation 5 Maint 5 er for 4 in Ir ng. 4 mark | on for hour aining hour ndia - hour ceting |
| Creating new starting a new Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financing Module:5 Introduction Genesis and Module:6 Patent- Proc example of | v produce w ventu sion- Inn Entre recogni Advant Entre ojection and the Develop Type edure, I | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp ment - International Context - Concept of IP Management, U s of Intellectual Property | ach Iana Dital ectiv Gse ir marl | geme and /e - n man | othe IPR ketin | ovation 5 Maint 5 er for 4 in Ir ng. 4 mark | on foi hour aining hour ms o hour ndia - hour |
| Creating new starting a ne Class Discus Module:3 Opportunity Competitive Module:4 Financial Pr Financial Pr Financing Module:5 Introduction Genesis and Module:6 Patent- Proc | v produce w ventu sion- Inn Entre recogni Advant Entre ojection and the Develop Type edure, I | ts and services, exploiting open innovation and collaboration re ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship tion and entry strategies-Entrepreneurship as a Style of M age- Use of IPR to protect Innovation preneurship- Financial Planning s and Valuation-Stages of financing - Debt, Venture Cap tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persp ment - International Context - Concept of IP Management, U s of Intellectual Property icensing and Assignment, Infringement and Penalty- Trader | ach Iana Dital ectiv Gse ir marl | geme and /e - n man | othe IPR ketin | ovation 5 Maint 5 er for 4 in Ir ng. 4 mark | on for hour aining hour ndia - hour ceting |



VIT[®] Vellore Institute of Technology

CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Copyright- Introduction, Industrial Designs- What is design? How to protect? Class Discussion- Major Court battles regarding violation of patents between corporate companies.

| Mod | dule:8 | Contemporary Issues | | | | 2 hours |
|------|--------------|-------------------------------|----------------------|-------------|------------------------|------------------|
| Gue | st lecture l | oy Industry Experts or R&D | organization | | | |
| | | | | Total L | ecture hours: | 45 hours |
| Tex | t Book(s) | | | | · | |
| 1. | Business | Transformations in the Era | of Digitalization (2 | 2019), Alc | oulou, W, IGI Global | l. |
| 2. | Innovati | ve science teaching (2019), | Mohan, R. (2019). | PHI Learn | ing Pvt. Ltd. | |
| Refe | erence Bo | oks | | | | |
| 1. | Researc | h on Entrepreneurship, Inno | vation, and Interna | ationalizat | tion, Pereira, E. T. I | GI Global. |
| 2. | Creative | marginality: Innovation at t | he intersections of | social scie | nces (2019), Dogan, | M Routledge. |
| 3. | Internati | onal intellectual property in | an integrated world | d economy | v (2019), Abbott, F. 1 | M., Cottier, T., |
| | & Gurry | , F. (2019), Aspen Publisher | s. | | | |
| | 1 | | | | | - |
| Mo | de of Eva | luation: CAT / Assignme | ent / Quiz / FAT | | | |
| Rec | ommende | ed by Board of Studies | 29-01-2021 | | | |
| Ann | roved by | Academic Council | No. 61 | Date | 18-02-2021 | |





| Course Code | COURSE TITLE | | L T | P | C |
|--|--|--|--|---|---|
| PHY1005 | Modern Physics | | 3 0 | 2 | 4 |
| Pre requisites | | | Syllabu | | ion |
| | | | v. | 1.0 | |
| Course Objectiv | | tions | | | |
| - | pply mathematics and physics in engineering applicat | | | | |
| | lear understanding of the physics related concepts ar | | | ues | |
| 3. To inculcate 1 | realistic skills of creating unique insight from what is | s being observ | vea. | | |
| Course Outcom | A. | | | | |
| | course the student will be able to | | | | |
| | ledge of thermodynamics to realistic problems | | | | |
| | lerstanding of the oscillatory motion of various object | ote and evetor | me | | |
| - | I wave nature of light and its applications | cis and system | .115 | | |
| - | pts of electromagnetic waves and their propagation | | | | |
| - | um mechanical ideas to subatomic domain. | | | | |
| | the fundamental principles of a laser and its types and | their opplied | otion in fi | oor on | ia |
| 6. Appreciate th | the fundamental principles of a faser and its types and | i then applied | | ber op | |
| Module:1 The | ermodynamics | | | 7 h | <u>, 11</u> |
| | | C i | 5100 | | ·u |
| | s remunology-system α surroundings rypes (| of systems | Differen | tvne | 3 (|
| = | s Terminology- system & surroundings, types (| - | | | |
| processes in TD, | Concept of Heat Capacity and work (analytic treat | tment), Zero | oth and Fi | rst law | S |
| processes in TD, thermodynamics | Concept of Heat Capacity and work (analytic treat Work done in Isothermal and adiabatic exp | tment), Zero cansion. Con | oth and Fincept of | rst law Entre | 's o p |
| processes in TD, thermodynamics | Concept of Heat Capacity and work (analytic treat | tment), Zero cansion. Con | oth and Fincept of | rst law Entre | s p |
| processes in TD, thermodynamics spontaneous and | Concept of Heat Capacity and work (analytic treat Work done in Isothermal and adiabatic exp | tment), Zero pansion. Con thermodyna | oth and Fincept of of other of the other of the other | rst law Entre ausius | s p ar |
| processes in TD, thermodynamics spontaneous and Kelvin's stateme | Concept of Heat Capacity and work (analytic trea Work done in Isothermal and adiabatic exp driven processes, Carnot's cycle, Second Law of | tment), Zero bansion. Con thermodyna of Entropy fi | oth and Fincept of amics- Claring Carn | rst law Entre ausius | s p ar |
| processes in TD, thermodynamics spontaneous and Kelvin's stateme Entropy Change i | Concept of Heat Capacity and work (analytic trea Work done in Isothermal and adiabatic exp driven processes, Carnot's cycle, Second Law of nts, Concept of Heat and work Engines, Derivation | tment), Zero bansion. Con thermodyna of Entropy fi | oth and Fincept of amics- Claring Carn | rst law Entre ausius | op ar cl |
| processes in TD, thermodynamics spontaneous and Kelvin's stateme Entropy Change i Module:2 Osc | Concept of Heat Capacity and work (analytic trea Work done in Isothermal and adiabatic exp driven processes, Carnot's cycle, Second Law of nts, Concept of Heat and work Engines, Derivation in reversible and Irreversible processes. Third law of | tment), Zero pansion. Con thermodyna of Entropy fr Thermodyna | oth and Fi ncept of unics- Cla from Carn amics. | rst law Entro ausius ot's cy 7 he | op ar cl |
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| Mod | ule:6 | Cryst | allogi | aphy | | | | | | | | | | 51 | hours |
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| Cond | luctor, s | semicon | ductor | and Ins | ulato | or; Basic | concep | ot of E | Band the | eory | . Basi | c ter | ms, ty | pes of cry | vstal |
| syste | ms, Br | avais la | ttices, | miller i | ndice | es, d spa | cing. | | | | | | | | |
| Mod | ule: 7 | | Ι | aser an | d Fil | ber Opti | ics | | | | | | | 6 h | nours |
| Prope | erties of | f laser b | eams: | mono-c | hrom | aticity, c | coheren | ice, di | rectiona | lity | and l | oright | tness, | Einstein's | 5 |
| theor | y of ma | atter rad | liation | interacti | on a | nd A and | l B coe | fficie | nts; amp | olifi | cation | of li | ght by | y populati | on |
| invers | sion, di | fferent | types | of lasers | : Rub | y Laser, | CO2 a | nd No | I:YAG I | lase | rs; ap | plicat | tions c | of lasers in | ı |
| engin | neering. | Light p | oropag | ation thr | ough | ı fibers, A | Accepta | ance a | ngle, N | ume | erical | Aper | ture, ' | Types of f | fibers |
| – step | p index | , gradec | l inde | x, single | mod | e & mult | timode | fiber | s. Detec | ctor | - PIN | phot | odiod | е. | |
| Mod | ule: 8 | | 0 | Contemp | orai | ry issues | 5 | | | | | | | 2] | hour |
| Guest | t Lectu | res by I | ndustr | y and R | &D (| Organiza | tions. | | | | | | | | |
| | | | | | | Tota | l Lectu | ire ho | urs: | | | | | 451 | hour |
| Text | book(s |) | | | | | | | | | | | | | |
| 1. | | , | undam | ientals of | f Phy | sics: Me | chanics | s, Rela | ativity, a | and ' | Thern | nodyı | namic | s, (2014), | Yale |
| | R. Shankar, Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics, (2014), Yale university Press, USA. | | | | | | | | | | | | | | |
| 2. | H. D. Young and R. A. Freedman, University Physics with Modern Physics, 2020, 15th Edition, | | | | | | | | | | | | | | |
| 2 | Pearson, USA. | | | | | | | | | | | | | | |
| 3. | R. A. Serway, J. W. Jewett Jr., Physics for Scientists and Engineers with Modern Physics, 2019, | | | | | | | | | | | | | | |
| 4. | 10th Edition, Cengage Learning, USA.D. K. Mynbaev and Lowell L. Scheiner, Fiber Optic Communication Technology, 2011, 1st | | | | | | | | | | | | | | |
| т. | Edition, Pearson, USA | | | | | | | | | | | | | | |
| 5. | M.N.O. Sadiku, Principles of Electromagnetics, 2015, 6th Edition, Oxford University Press, | | | | | | | | | | | | | | |
| 6. | W. Sil | fvast, L | aser F | undame | ntals, | , 2012, 21 | nd Edit | ion, C | ambrid | ge I | Jnive | rsity 1 | Press, | India. | |
| Refe | rence] | Books | | | | | | | | | | | | | |
| 1. | H. J. F | Pain, Th | e Phys | sics of vi | brati | ons and | waves, | 2013, | 6th Ed | itioı | n, Wil | ey Pı | ublica | tions, Indi | ia. |
| 2. | K. Krane, Modern Physics, 2020, 4th Edition, Wiley Edition, India. | | | | | | | | | | | | | | |
| 3. | Lasers | : Princi | ples a | nd Appli | catio | ns, J. Wi | lson an | d J.F. | B. Haw | kes | (2003 |) | | | |
| Mod | le of E | valuati | ion: C | CAT / A | ssigr | nment / | Quiz / | FAT | '/Proj | ect | / Sen | ninar | r | | |
| List o | f Chal | lenging | Expe | eriment | s (In | dicative | .) | | | | | | | | |
| | of Challenging Experiments (Indicative) Clean Energy- Solar Cell | | | | | | | | | | | | | | |
| 2. | Integrated Optics- Angle of Prism | | | | | | | | | | | | | | |
| 3. | Quality Check for soft drinks- Refractive Index of liquid | | | | | | | | | | | | | | |
| | Advanced Material Analysis through Quantum Physics- Photoelectric Effect | | | | | | | | | | | | | | |
| | Engineering Application of Nanomaterials | | | | | | | | | | | | | | |
| | Electron Diffraction | | | | | | | | | | | | | | |
| | Monochromators in Sophisticated Instrument – Laser Grating | | | | | | | | | | | | | | |
| | Integrated Optics- Angle of Minimum Deviation | | | | | | | | | | | | | | |
| | Acceptance Angle and Numerical Aperture – Optical Fiber | | | | | | | | | | | | | | |
| | | Phase and Group Velocity of EM waves | | | | | | | | | | | | | |
| | | | up ve | | | waves | | r | Tatal T | apo | rator | v Ho | iire | 30 hours | |
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UNIVERSITY CORE

B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

FLC4097 - Foreign Language Course Basket

| Sl. No. | Course Code | Course Title | Page No. |
|---------|-------------|------------------------|----------|
| 1. | ESP1001 | ESPANOL FUNDAMENTAL | 152 |
| 2. | ESP2001 | ESPANOL INTERMEDIO | 154 |
| 3. | FRE2001 | Francais progressif | 156 |
| 4. | GER1001 | Grundstufe Deutsch | 158 |
| 5. | GER2001 | Mittelstufe Deutsch | 160 |
| 6. | GRE1001 | Modern Greek | 162 |
| 7. | JAP1001 | Japanese for Beginners | 164 |
| 8. | RUS1001 | Russian for Beginners | 166 |





B. Tech Computer Science and Engineering and Business Systems

| Course Code | Course Title | L | Т | Р | J | C |
|---------------|---------------------|---|-------|--------|--------|---|
| ESP1001 | ESPAÑOL FUNDAMENTAL | 2 | 0 | 0 | 0 | 2 |
| Pre-requisite | NIL | | Sylla | bus y | versio | n |
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Course Objectives:

The course gives students the necessary background to:

- 1. Demonstrate Proficiency in reading, writing, and speaking in basic Spanish. Learning vocabulary related to profession, education centres, day today activities, food, culture, sports and hobby, family set up, workplace, market and classroom activities is essential.
- 2. Demonstrate the ability to describe things and will be able to translate into English and vice versa.
- 3. Describe in simple terms (both in written and oral form) aspects of their background, immediate environment and matters in areas of immediate need.

Expected Course Outcome:

The students will be able to

- 1. Remember greetings, giving personal details and Identify genders by using correct articles
- 2. Apply the correct use of SER, ESTAR and TENER verb for describing people, place and things
- 3. Create opinion about time and weather conditions by knowing months, days and seasons in Spanish
- 4. Create opinion about people and places by using regular verbs
- 5. Apply reflexive verbs for writing about daily routine and create small paragraphs about hometown, best friend and family

Module: 1 Abecedario, Saludos y Datos personales: Origen, Nacionalidad, Profesión 3 hours

Competencia Gramática: Vocales y Consonantes. Artículos definidos e indefinidos (Numero y Genero).

Competencia Escrita: Saludos y Datos personales

Module: 2 Edad y posesión. Números (1-20)

Competencia Gramática: Pronombres personales. Adjetivos. Los verbos SER y TENER. Competencia Escrita: Escribe sobre mismo/a y los compañeros de la clase

Module: 3Vocabulario de Mi habitación. Colores. Descripción de lugares y cosas5 hoursCompetencia Gramática: Adjetivos posesivos. El uso del verbo ESTAR. Diferencia entre SER y ESTAR.
Competencia Escrita: Mi habitación5 hours

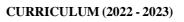
| Module: 4Mi familia. Números (21-100). Direcciones. Expresar la hora. Los meses del año. | 5 hours |
|---|---------|
|---|---------|

Competencia Gramática: Frases preposicionales. Uso del HAY. La diferencia entre MUY y MUCHO. Uso del verbo GUSTAR

Competencia Escrita: Mi familia. Dar opiniones sobre tiempo

Module: 5Expresar fechas y el tiempo. Dar opiniones sobre personas y lugares.5 hoursCompetencia Gramática: Los verbos regulares (-AR, -ER, -IR) en el presente. Adjetivosdemostrativos.Competencia Escrita: Mi mejor amigo/a. Expresar fechas. Traducción ingles a español y Español a Ingles.Solutional destructional destructiona

3 hours







| M | odule: 6 | Describir el diario. Las activi | dades cotidianas. | | | 3 hours |
|-----|------------|---|---------------------|-------------|---------------------|---------------|
| Co | ompetenci | a Gramática: Los Verbos y prono | ombres reflexivos. | Los verbo | os pronominales co | on e/ie,o/ue, |
| e/i | , u/ue. | | | | | |
| Co | mpetencia | a Escrita: El horario. Traducción i | ngles a español y E | lspañol a I | Ingles. | |
| | | | | | | |
| Moo | | Dar opiniones sobre comidas y Describir mi ciudad y Ubicar l | | | i haciendo. | 4 hours |
| Co | mpetenci | a Gramática: Los verbos irregu | lares. Estar + geru | indio. Poo | der + Infinitivo. C | Competencia |
| Ese | crita: Con | versación en un restaurante. Trad | ucción ingles a esp | añol y Esp | pañol a Ingles.Mi c | iudad natal. |
| Mi | i Universi | dad. La clase.Mi fiesta favorita. | | | | |
| | | | | | | |
| Moo | dule: 8 | Guest Lectures / Native Spea | akers | | | 2 hours |
| | | Total Leo | ture hours | | | 30 hours |
| Tex | t Book(s) | | | | | |
| 1. | | ook: "Aula Internacional 1", Ja | | Garcia, | Agustin Garmeno | lia, Carmen |
| | | Goyal Publication; reprinted Ed | lition, (2010) | | | |
| | erence B | | | | | |
| 1. | • | on Gramática!" Phil Turk and Mi | | • | | |
| | perfect: | Spanish Vocabulary", Dorothy R | ichmond, McGraw | Hill Conte | emporary, USA, 20 | 012. |
| 2. | "Practic | e makes perfect: Basic Spanish' | ', Dorothy Richmo | ond, McG | raw Hill Contemp | orary, USA |
| | 2009. | | | | | |
| 3. | "Pasapo | orte A1 Foundation", Matilde C | Cerrolaza Aragón, | Óscar C | errolaza Gili, Beg | goña Llovet |
| | Barquer | o, Edelsa Grupo, España, 2010. | - | | - | |
| Rec | ommend | ed by Board of Studies | 22.02.2016 | | | |
| Ann | proved by | Academic Council | No. 41 | Date | 17.06.2016 | |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Cou | rse Code | Course Title | L | Т | P | J | C |
|----------------|-------------------|--|-----------------|-----------|--------|-------|-----|
| ES | SP2001 | ESPAÑOL INTERMEDIO | 2 | 0 | 2 | 0 | ~ |
| Pre-requisite | | | S | yllabus | s vers | ion | |
| | | | | v. | 1.0 | | |
| Course Obje | | | | | | | |
| U | | ecessary background to: | | | | | |
| | | isten and communicate in Spanish in their | | | | | |
| | | be situations by using present, past and fut | ure tenses in S | Spanish | 1. | | |
| 3. Enable to | develop the cor | nprehension skill in Spanish language. | | | | | |
| | | | | | | | |
| - | ourse Outcome: | | | | | | |
| The students w | | | | | DOI | | |
| | ntences in near f | future and future tenses and correctly using | g the prepositi | ons like | e POF | t and | d |
| PARA | ntancas in proto | rito perfecto and correctly use the direct a | nd indiract ch | iant nr | nour | c | |
| | - | b likes and dislikes and also give command | | • • | | | |
| | | ense by using imperfecto and idefinido for | | | | • | |
| | - | panish at places like restaurants, hotels, Sh | | - | | 15 | |
| | | nt Spanish speaking countries and its culture | - | • | | | |
| | | | | | | | |
| Module:1 | Números (101 | – 1 millón). Expresar los planesfuturos. l | Los números | | 7 | hou | rs |
| | ordinales. | | | | | | |
| Competencia | Gramática: Futu | uros cercanos (Ir+a+Infinitivo). Futuros | (Verbos regul | ares e i | rregu | lares | s). |
| Uso del POR | y PARA. | | | | | | |
| - | | cción ingles a español y español a Ing | les. | | | | |
| Comprensión | - Los textos y V | ideos | | | | | |
| Madular | T ag yon ag | lang utamañag. Castan walar dagawar | | | | | |
| Module:2 | | lores y tamaños. Costar, valer, descuent ombres objetivos directos e indirectos. El | | | | 8 ho | |
| - | | ón ingles a español y español a Ingles. Co | | | | Vide | 209 |
| Competencia | | on ingles a españor y españor a ingles. ev | | | 103 y | Viuc | .05 |
| Module:3 | Escribir un | Correo electrónico formal einform | al. | | | 7 ho | urs |
| | | prativos formales e informales. Pretérito per | | tencia I | | | |
| - | _ | y español a Ingles. | | | | | |
| | - Los textos y V | | | | | | |
| - | | | | | | | |
| Module:4 | Currículo V | Vitae. Presentarse en unaentrev | vista inform | al. | (| 5 ho | ur |
| Competencia | Gramática: Prete | érito imperfecto. Pretérito indefinido. | | | | | |
| - | | ión ingles a español y español a Ingles. | | | | | |
| competencia | | ideos | | | | | |
| Comprensión | - Los textos y V | Iucos | | | | | |
| - | - Los textos y V | lucos | | | | | |





B. Tech Computer Science and Engineering and Business Systems

Comprensión oral: Introducción personal, Expresar los planes futuros. ¿Qué vas a hacer en laspróximas vacaciones?

Comprensión auditiva: Las preguntas sobre un cuento auditivo. Relacionar el audio con lasimágenes. Las preguntas basadas en canciones.

Medio de transporte: Comprar y Reservar billetes.

Module:6 Diálogos entre dos

5 hours

Comprensión oral: Diálogos entre dos (cliente y tendero de ropas, pasajero y empleado, en unrestaurante, Reservación de habitación en un hotel). Presentación en una entrevista.

Comprensión auditiva: Las preguntas basadas en canciones. Las preguntas basadas en diálogos.

Module:7 Presentación de los países hispánicos.

5 hours

Comprensión oral: Dialogo entre un médico y paciente. Presentación de los países hispánicos. Describir su infancia. Describir vacaciones últimas o las actividades de último fin de semana.

Comprensión auditiva: Rellenar los blancos del cuento en pasado. Las preguntas basadas en elcuento. Las preguntas basadas en un anuncio

| Module:8 | Guest Lectures/ Native Speakers | | 2 hours |
|----------|---------------------------------|--|---------|
| | Total Lecture hours:45 | | S |

Text Book(s)

1. "Aula Internacional 1", Jaime Corpas, Eva Garcia, Agustin Garmendia, Carmen Soriano Goyal Publication; reprinted Edition, Delhi (2010).

| Refe | Reference Books | | | | | | |
|------|---|--|--|--|--|--|--|
| 1. | "¡AcciónGramática!", Phil Turk and Mike Zollo, Hodder Murray, London 2006. | | | | | | |
| 2. | "Practice makes perfect: Spanish Vocabulary", Dorothy Richmond, McGraw Hill Contemporary, | | | | | | |
| | USA, 2012. | | | | | | |
| 3. | "Pasaporte A1 Foundation", Matilde Cerrolaza Aragón, Óscar Cerrolaza Gili, Begoña Llovet | | | | | | |
| | Barquero, Edelsa Grupo, España, 2010. | | | | | | |
| 4. | "Practice makes perfect: Basic Spanish", Dorothy Richmond, McGraw Hill Contemporary, USA | | | | | | |
| | 2009. | | | | | | |

Recommended by Board of StudiesApproved by Academic CouncilNo.41Date17.06.2016





B. Tech Computer Science and Engineering and Business Systems

| Course Code | Course Title | L | Τ | Р | J | С |
|---------------|---------------------|------------------|---|--------|---|---|
| FRE2001 | Français Progressif | 2 | 0 | 1 | 0 | 3 |
| Pre-requisite | Français quotidien | Syllabus version | | | n | |
| | | | , | v. 1.0 |) | |

Course Objectives:

The course gives students the necessary background to:

- 1. Understand isolated sentences and frequently used expressions in relation to immediate priorityareas (personal or family information, shopping, close environment, work).
- 2. Communicate in simple and routine tasks requiring only a simple and direct exchange of information on familiar and habitual topics.
- 3. Enable students to describe with simply means his training, his immediate environment and evoke familiar and habitual subjects, evoke subjects that correspond to immediate needs.

Expected Course Outcome:

The students will be able to :

- 1. Understand expressions in French.
- 2. Create senteces by using frequent lexicon related to himself, his family, his close environment (family, shopping, work, school, etc).
- 3. Understand simple, clear messages on internet, authentic documents.
- 4. Analyse predictable information in common documents, such as advertisements, flyers, menus, schedules, simple personal letters.
- 5. Create simple and routine tasks.
- 6. Create simple and direct exchange of information on familiar activities and topics.

Module:1 Expressions simples

La vie quotidiennes - Le verbe pronominal - Le passé composé avec l'auxiliaire - avoir et être- le passérécent : venir de + infinitif - Le comparatif - Le superlatif - Les mots interrogatifs (les trois formes) Savoir-faire pour: Faire des achats, faire des commandes dans un restaurant, poser des questions.

Module:2 Les activitiés quotidiennes

La vie privée et publique (Les achats, Les voyages, les transports-La nourriture, etc.) - Les lieux de la ville - Les mots du savoir-vivre - Les pronoms indéfinis - Les pronoms démonstratifs - Les pronoms complémentsobjets directs/ indirects - La formation du future simple et future proche Savoir-faire pour: Réserver les billets pour le voyage, réserver les chambres dans un hôtel, S'informer surles lieux de la ville, indiquer la direction à un étranger.

Module:3 Les activités de loisirs

Les loisirs (sports/spectacles/activités) - Les moments de la journée, de l'année- La fête indienne et française – Les goûts - L'impératif - La négation de l'impératif-La place du pronom à l'impératif avec un verbe pronominal.

Savoir-faire pour: Parler de ses goûts, raconter les vacances, formuler des phrases plus compliquées, Raconter les souvenirs de l'enfance, parler sur la tradition de son pays natal.

8 hours

6 hours

7 hours



Γ

VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Mad14 | | | |
|--|---|--|---|
| Module:4 | La Francophonie | | 7 hours |
| L'espace fr | rancophone - Première appi | roche de la société française – La | consommation alimentaire – |
| caractérise | r un objet – décrire une tent | ue - Le pronom relatif (qui/que/do | ont/où) |
| | | sse-Portrait d'une personne-Cart | _ |
| d'acceptati | on ou de refus -Article de | presse - rédaction d'un événemen | ıt. |
| | | | |
| Module:5 | 3 | | 5 hours |
| | _ | les fêtes en France – Parler de s | sa famille – réserver un billet |
| à l'agence | - la gastronomie française | | |
| | | | |
| Module:6 | - | | 5 hours |
| | • • • | les vacances – les achats – réserv | er une chambre dans un hôtel |
| – les plus g | grands français - raconter des | évènements passés | |
| | | | |
| Module:7 | - | | 5 hours |
| | | ne – placer une commande au res | staurant –- la mode - parler de |
| son projet c | l'avenir. | | |
| Module:8 | Guest lecures : Guest lecu | | 2 hours |
| | | | |
| wiouule:0 | Guest lecules . Guest lecu | 1 | 2 hours |
| | Guest lecures . Guest lecu | Total Lecture hours | |
| | | 1 | |
| Text Book | x(s) | Total Lecture hours | : 45 hours |
| Text Book | (s) Ego 1, Méthode de français, | Total Lecture hours: Annie Berthet, Hachette, Paris 201 | : 45 hours 0. |
| Text Book1.Alter I2.Alter I | (s) Ego 1, Méthode de français, Ego 1, Cahier d'exercices, Ai | Total Lecture hours | : 45 hours 0. |
| Text Book1.Alter I2.Alter IReference | (s) Ego 1, Méthode de français, Ego 1, Cahier d'exercices, An Books | Total Lecture hours: Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. | : 45 hours 0. |
| Text Book1.Alter I2.Alter IReference1.CONN | (s) Ego 1, Méthode de français, Ego 1, Cahier d'exercices, An Books NEXIONS 1, Méthode de fra | Total Lecture hours Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. nçais, Régine Mérieux, Yves Loise | 45 hours 0. eau, Les Éditions Didier, 2010. |
| Text Book1.Alter I2.Alter IReference1.CONN2CONN | E go 1, Méthode de français, Ego 1, Cahier d'exercices, An Books VEXIONS 1, Méthode de fra | Total Lecture hours Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. nçais, Régine Mérieux, Yves Loise rcices, Régine Mérieux, Yves Lois | 45 hours 0. eau, Les Éditions Didier, 2010. eau, Les Éditions Didier, 2010 |
| Text Book1.Alter I2.Alter IReference1.CONN2CONN | E go 1, Méthode de français, Ego 1, Cahier d'exercices, An Books VEXIONS 1, Méthode de fra | Total Lecture hours Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. nçais, Régine Mérieux, Yves Loise | 45 hours 0. eau, Les Éditions Didier, 2010. eau, Les Éditions Didier, 2010 |
| Text Book1.Alter I2.Alter IReference1.CONN2CONN3Fréque | Ego 1, Méthode de français, Ego 1, Cahier d'exercices, An Books NEXIONS 1, Méthode de fra NEXIONS 1, Le cahier d'exe ence jeunes-1, Méthode de fr | Total Lecture hours Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. nçais, Régine Mérieux, Yves Lois rcices, Régine Mérieux, Yves Lois ançais, G. Capelle et N.Gidon, Ha | 45 hours 0. eau, Les Éditions Didier, 2010. eau, Les Éditions Didier, 2010 chette, Paris, 2010. |
| Text Book1.Alter H2.Alter HReference1.CONN2CONN3Fréque | Ego 1, Méthode de français, Ego 1, Cahier d'exercices, An Books NEXIONS 1, Méthode de fra NEXIONS 1, Le cahier d'exe ence jeunes-1, Méthode de fr | Total Lecture hours Annie Berthet, Hachette, Paris 201 nnie Berthet, Hachette, Paris 2010. nçais, Régine Mérieux, Yves Loise rcices, Régine Mérieux, Yves Lois | 45 hours 0. eau, Les Éditions Didier, 2010. eau, Les Éditions Didier, 2010 chette, Paris, 2010. |



Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act 1956)



| Course Code | Course Title | L | Т | P | J | C |
|--|---|--|--|---------------------------------|--|---|
| GER1001 | GRUNDSTUFE DEUTSCH | 2 | 0 | 0 | 0 | 2 |
| Pre-requisite | NIL | | Sylla | abus | versi | on |
| The requisite | | | | v. 1.(|) | |
| Course Objectives | : | | | | | |
| U | udents the necessary background to: | | | | | |
| 1. Demonstrate Pr | oficiency in reading, writing, and speaking in basic Gern | 1an. L | earni | ng vo | ocabu | lary |
| related to profes | ssion, education centres, day-to-day activities, food, culture | e, spor | rtsand | l hobb | oy, fa | mily |
| set up, workpla | ce, market and classroom activities are essential. | | | | | |
| 2. Make the studer | nts industry oriented and make them adapt in the German of | culture | e . | | | |
| Expected Course | Outcome: | | | | | |
| The students will be | | | | | | |
| 1. Remember gree | eting people, introducing oneself and understanding basic | expre | ssion | ıs inG | erma | n. |
| - | c grammar skills to use these in a meaning way. | 1 | | | | |
| | nner's level vocabulary | | | | | |
| e | s in German on a variety of topics with significant precision | n and | in det | ail | | |
| | nprehension of written discourse in areas of special interest | | in det | | | |
| 5. Apply good con | iprenension of written discourse in dreds of speedd interest | | | | | |
| | | | | | | |
| Module: 1 | | | | | 3 h | 0111 |
| Module: 1 | ackunde Alphabet Personalpronomen Verben beissen | | | vohn | | our |
| Begrüssung, Lande | eskunde, Alphabet, Personalpronomen, Verben- heissen, | komn | | | en, le | rne |
| Begrüssung, Lande Zahlen (1-100), W | V-Fragen, Aussagesätze, Nomen- Singular und Plural, | komn | | | en, le | rne |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) | komn der A | Artike | el -Be | en, le | rne |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti | V-Fragen, Aussagesätze, Nomen- Singular und Plural, | komn der A | Artike | el -Be | en, le | rne |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) | komn der A | Artike | el -Be | en, le estim | rne mte |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) | komn der <i>A</i> and ii | Artike n Euro | el -Be | en, le estim 3 h | rne mte |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl | komn der <i>A</i> and in | Artike n Euro viten u | opa und d | en, le estim 3 h ie Wo | rne mte |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah | komn der <i>A</i> and in | Artike n Euro viten u | opa und d | en, le estim 3 h ie Wo | rne mte |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr | komn der <i>A</i> and in | Artike n Euro viten u | opa und d | en, le estimi 3 h ie Wo mit , | rne mte nou och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) estellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw | komn der A and in nresze age, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | en, le estimu ie Wo mit , 5 h | rne mte ou och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhr | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | en, le estimu ie Wo mit , 5 h | rne mte ou och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhr | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) estellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | en, le estimu ie Wo mit , 5 h | rne mte ou och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhr | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | rne mte och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhrz Lernziel : Sätze mi | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | rne mte och Sie oen, |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deu | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) rstellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa t Modalverben, Verwendung von Artikel, Adjektiv beim Vo | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | rne mte och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deu Lernziel : Die Übu | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) estellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa t Modalverben, Verwendung von Artikel, Adjektiv beim Vo | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | rne mte och Sie oun oen, |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome: Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deu Lernziel : Die Übu | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) stellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa t Modalverben, Verwendung von Artikel, Adjektiv beim Vo tsch – Englisch / Englisch – Deutsch) ing von Grammatik und Wortschatz | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | rne mte ou och Sie |
| Begrüssung, Lande Zahlen (1-100), W Unbestimmter Arti Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronome Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deu Lernziel : Die Übu | V-Fragen, Aussagesätze, Nomen- Singular und Plural, ikel) estellen, Grundlegendes Verständnis von Deutsch, Deutschl erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Fr reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A zeit, Präpositionen, Lebensmittel, Getränkeund Essen, Fa t Modalverben, Verwendung von Artikel, Adjektiv beim Vo | komn der A and in rresze age, Artike rben, | Artike n Euro eiten u Impe: l) Tre | el -Be opa und d rativ | an, le estimu ie Wo mit , 5 h revert | ioun ocho Sie ioun oen, |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Module: 6 | | 3 hours |
|------------------------------|--------------------|---------|
| Aufsätze :Die Familie, Bur | nd, | |
| Lernziel : Aktiver, selbstän | | |
| | | |
| Module: 7 | 2 | 4 hours |
| Dialoge: | | |
| a) Gespräche mit eine | | |
| b) Gespräche beim Ein | ıdlung ; | |
| c) in einem Hotel - an | | |
| d) Ein Telefongespräcl | | |
| Module: 8 | | 2 hours |
| Guest Lectures / Native Spe | itik | |
| | 30 | hours |
| | | |
| Text Book(s) | | |
| 1. Netzwerk Deutsch als | Helen Schmtiz, Tan | ja |
| Sieber, Klett-Langensc | | |
| Reference Books | | |
| 1. Lagune, Hartmut Aufd | | |
| 2. Deutsche Sprachlehre | | |
| 3. Studio d A1, Hermann | | |
| 4. Tangram Aktuell-I, Ma | uenchen: 2012 | |
| 5. <u>www.goethe.de</u> | | |
| wirtschaftsdeutsch.deh | | |
| klett-sprachen.de www | | |
| M.L. CT. 1. CAT | | |
| Mode of Evaluation: CAT | | |
| Recommended by Board | <u>(201</u> (| |
| Approved by Academic C | 6-2016 | |





| Course Code | Course Title | L | Т | Р | J | С |
|--|--|----------|--------|--------|----------------------------|-------|
| GER2001 | Mittelstufe Deutsch | 2 | 0 | 1 | 0 | 3 |
| Pre-requisite | Grundstufe Deutsch | S | Syllab | us v | ersi | on |
| | | | v | . 1.0 | | |
| Course Objectives: | • | | | | | |
| The course gives stud | ents the necessary background to: | | | | | |
| 1. Improve the con | nmunication skills in German language | | | | | |
| 2. Improve the list | tening and understanding capability of German FM Radi | o, and | TV F | Progr | amr | nes, |
| Films | | | | | | |
| 3. Build the confid | lence of the usage of German language and better understan | ding o | f the | cultu | re | |
| Expected Course O | utcome: | | | | | |
| The students will be a | ble to | | | | | |
| 1. Create proficienc | y in advanced grammar and rules | | | | | |
| 2. Understand the te | exts including scientific subjects. | | | | | |
| 3. Create the ability | of listening and speaking in real time situations. | | | | | |
| 4. Create the vocab | ulary in different context-based situations. | | | | | |
| 5. Create written co | mmunication in profession life, like replying or sending E-m | nails an | d lett | ers ir | ı a | |
| company. | | | | | | |
| 6. Cre#ate commun | ication related to simple and routine tasks. | | | | | |
| | | | | | | |
| | | | | | | |
| Module:1 Profi | ciency in Advanced Grammar | | | | 9 ł | nours |
| | • | Wieder | holun | g dei | | ours |
| Grammatik : Tempu | s- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V | Wieder | holun | g dei | | ours |
| Grammatik : Tempu Grundstufen gramn | s- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V | Wieder | holun | g dei | | nours |
| Grammatik : Tempu Grundstufen gramn | is- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V natik | Wieder | holun | g dei | | iours |
| Grammatik : Tempu Grundstufen gramn Lernziel: Sätzeschre | us- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V natik iben in verschiedenen Zeiten. | Wieder | holun | g dei | 1 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Under | us- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V natik iben in verschiedenen Zeiten. erstanding of Technical Texts | Wieder | holun | g dei | 1 | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, | erstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) | Wieder | holun | g dei | 1 | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, | us- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V natik iben in verschiedenen Zeiten. erstanding of Technical Texts | Wieder | holun | g der | 1 | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo | as- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V natik iben in verschiedenen Zeiten. e rstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens | Wieder | holun | g der | - 91 | IOUTS |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik aiben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens | | | g der | - 91 | IOUTS |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv | | | g der | - 91 | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik aiben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens | | | g dei | - 91 | IOUTS |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen | | | g der | 91 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik aiben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations | y Sätze | | | 91 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus | y Sätze | | | 91 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com Übersetzung :Techn Englische und umg | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik aiben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, | y Sätze | | | 91 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com Übersetzung :Techn Englische und umg | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus | y Sätze | | | 91 | nours |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com Übersetzung :Techn Englische und umg Lernziel : Übung vo | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik aiben in verschiedenen Zeiten. Perstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, n Grammatik und Wortschatz | y Sätze | | | 91 91 91 81 ns | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Übersetzung : Techn Englische und umg Lernziel : Üburg vo | as- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. erstanding of Technical Texts Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, n Grammatik und Wortschatz | 7 Sätze | | | 91 91 91 81 ns | IOUTS |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com Übersetzung :Techn Englische und umg Lernziel : Üburg vo | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, n Grammatik und Wortschatz h Audioübung : Familie, Leben in Deutschland, Am Bahnh | 7 Sätze | | | 91 91 91 81 ns | |
| Grammatik : Tempu Grundstufen gramm Lernziel: Sätzeschre Module:2 Unde Grammatik : Passiv, Lernziel: Passiv, Fo Module:3 Unde Adjektivdeklination, Lernziel: Verbindun Module:4 Com Übersetzung :Techn Englische und umg Lernziel : Üburg vo | Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, Vatik iben in verschiedenen Zeiten. Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens Perstanding of Scientific texts Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitivg zwischen Adjektiv beim Nomen municating in Real Time Situations ische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, n Grammatik und Wortschatz nisition of the Vocabulary of the advanced Level h Audioübung : Familie, Leben in Deutschland, Am Bahnh storie, Tagesablauf in eineranderen Stadt, | 7 Sätze | | | 91 91 91 81 ns | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Module:6 | Ability to Communicate | in Professional L | ife | | 9 hours |
|---------------|--------------------------------|---------------------|------------|-------------------------|------------|
| Hörverständ | lnis durch Audioübung: Übe | rberühmte Persönl | ichkeiten, | Feste in Deutschland, | |
| Videos :We | tter, An der Universität,ein Z | immer buchen, Stu | dentenlebe | n,Städteund Landeskur | nde |
| Lernziel : H | lörverständnis, Landeskunde | | | | |
| | | | | | |
| Module:7 | Ability to Communicate | in Task-based Si | tuations | | 7 hours |
| Hörverständ | nis durch Audioübung: FM R | Radio aus Deutschla | nddVideos | s: Fernseher aus Deutse | chland |
| Lernziel : LS | SRW Fähigkeiten | | | | |
| | Total Lecture hours: | | 60 | hours | |
| | | | | | |
| Text Book | (s) | | | | |
| 1. Tangrai | nAktuell II, Rosa Maria Da | llapizza, Beate Bli | iggel, Max | K Hueber Verlag, Münc | hen : 2010 |
| Reference | Books | | | | |
| 1. Themer | Aktuell, Heiko Bock, Muelle | r Jutta, MaxHuebe | r Verla, M | uenchen : 2010 | |
| 2. Deutsch | Sprachlehre fuer Auslaender | , Schulz Griesbach | , Max Hue | ber Verlag, Muenchen | : 2012 |
| 3. Lagune | , Deutsch als Fremdsprache, J | utta Müller, Storz | Гhomas, H | ueber Verlag, Ismaning | g: 2013 |
| 4. Studio d | l A1, Hermann Funk, Christin | na Kuhn, Max Huer | rberVerlag | , München : 2011 | |
| I | | | | | |
| Mode of Eva | aluation: CAT / Assignme | nt / Quiz / FAT | | | |
| Recommend | ed by Board of Studies | | | | |
| Approved by | Academic Council | No.41 | Date | 17.06.2016 | |





| | de | | Course | e Title | |] | | Т | P | J | С |
|---|---|---|--|---|--|--|--|--------------------------------|--------------------------------|--|------------------------------|
| GRE1001 | | | Modern | Greek | | , | 2 | 0 | 0 | 0 | 2 |
| Pre-requis | ite | NIL | | | | | S | ylla | | versio | n |
| | | | | | | | | | v. 1 | .0 | |
| Course Objec | | | | | | | | | | | |
| | | ek terminology | • | | 0 1 | ecializati | on | | | | |
| | | in Modern Gre | | •••• | | | | | | | |
| 3. To provid | e genera | al information a | bout Greece | (e.g. geog | graphy, weat | her, food | etc.) | | | | |
| Expected Cor | urse Oı | itcomes: | | | | | | | | | |
| 4. Students v | | | | | | | | | | | |
| | | ounce Greek sy | mbols and y | vords, beir | ng more cons | scious an | d co | nfide | ent ii | 1 the 1 | isage |
| | • • | ocabulary deri | | | 0 | | | | | | 0 |
| | - | Iodern Greek la | | | vdav convers | sation. | | | | | |
| | | ntents from scie | | | - | | s and | l wo | rds. | becon | ning |
| | | amental linguis | | | | - | | | | | 0 |
| | | formulate hype | 1 | | | | | • | | | |
| - | | e about the evol | | | - | | | | | | |
| | | een English an | | - | | | | | U | 1 | |
| | | portant socio-e | | | | urope, de | evelo | ping | thei | r apti | ude |
| for critical | | - | | | 1 0 | 1 | | 1 0 | | 1 | |
| | | <u> </u> | | | | | | | | | |
| Module:1 | Greek symbo | Alphabet: Co ls | orrect usaş | ge and Pr | onunciatio | on of Gi | eek | | | 4 | hou |
| | | | .1 1 | ha-iota / | epsilon-iot | a / omic | ron- | iota | / ar | nd up | silon |
| Vowels and | phoneti | c rules of dipl | hthongs: alj | Jilu Iotu / | | | | | | | |
| | - | c rules of dipl sonants and the | | | on; double co | onsonant | s and | l dig | raph | ns. Gra | amm |
| epsilon-upsil | on; cons | - | ir correct pr | onunciatio | | | | - | - | | amm |
| epsilon-upsil | on; cons | sonants and the | ir correct pr | onunciatio | | | | - | - | | amm |
| epsilon-upsil | on; cons | sonants and the | ir correct pr 4 Greek lette | onunciatio ers; correc | t pronunciati | ion of di | phtho | - | - | aphs. | |
| epsilon-upsiloskills: correct | on; cons pronune Greeti Greek | sonants and the ciation of the 2 ngs, introduce Names | ir correct pr 4 Greek lette cing onese | onunciatio ers; correc lf; Prope | t pronunciati r Nouns a | ion of dip and Pro | phtho per | ongs | digr | aphs. | hou |
| epsilon-upsiloskills: correct | on; cons pronune Greeti Greek | sonants and the ciation of the 2 ngs, introduce Names | ir correct pr 4 Greek lette cing onese | onunciatio ers; correc lf; Prope | t pronunciati r Nouns a | ion of dip and Pro | phtho per | ongs | digr | aphs. | hou |
| epsilon-upsiloskills: correct Module:2 Communicative form. | on; cons pronund Greeti Greek /e functi | sonants and the ciation of the 2 ngs, introduc Names ons: using form | ir correct pr 4 Greek lette cing onese mal and info | onunciatio ers; correc If; Prope ormal gree | t pronunciati r Nouns a tings; introc | ion of dij and Pro | phtho per nesel | f us | digr | aphs. 3 affirm | hou ative |
| epsilon-upsiloskills: correct Module:2 Communicative form. | on; cons pronund Greeti Greek /e functi | sonants and the ciation of the 2 ngs, introduc Names ons: using form | ir correct pr 4 Greek lette cing onese mal and info | onunciatio ers; correc If; Prope ormal gree | t pronunciati r Nouns a tings; introc | ion of dij and Pro | phtho per nesel | f us | digr | aphs. 3 affirm | hou ative |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills | on; cons pronund Greeti Greek //e functi s: nomin | sonants and the ciation of the 2 ngs, introduc Names ons: using form | ir correct pr 4 Greek lette cing onese mal and info | onunciatio ers; correc If; Prope ormal gree | t pronunciati r Nouns a tings; introc | ion of dij and Pro | phtho per nesel | f us | digr | aphs. 3 affirm | hou ative |
| epsilon-upsil skills: correct | on; cons pronund Greeti Greek 7e functi s: nomin called). | sonants and the ciation of the 2 ngs, introduc Names ons: using form native case and | ir correct pr 4 Greek lette cing onese mal and info vocative cas | onunciatic ers; correc If; Prope ormal gree se (singula | t pronunciati r Nouns a tings; introc r), personal p | ion of dij and Pro ducing o pronouns | phtho per nese | f us | digr | aphs. 3 affirm | hou ative |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written commu | Greeti Greeti Greek Ze functi s: nomin called). unication | sonants and the ciation of the 2 ngs, introduce Names ons: using form native case and n skills: introduce | ir correct pr 4 Greek letter cing onesel mal and info vocative cas acing onesel | onunciatic ers; correc If; Prope ormal gree se (singula | t pronunciati r Nouns a tings; introc r), personal p | ion of dij and Pro ducing o pronouns | phtho per nese | f us | digr | aphs. 3 affirm (to be | hou ative) and |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communication Module:3 | on; cons pronund Greeti Greek /e functi s: nomin called). unication Nation | sonants and the ciation of the 2 ngs, introduce Names ons: using form ative case and n skills: introduce ality and Pr | ir correct pr 4 Greek lette cing onese mal and info vocative cas noting onesel ovenance | onunciatio ers; correc If; Prope ormal gree se (singula f using Gr | t pronunciati r Nouns a tings; introc r), personal p reek letters a | ion of dij and Pro ducing o pronouns and word | phtho per nese , ver s. | f us bs ε | digr ing a ίμαι | aphs. 3 affirm (to be | hou ative |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communicativ Module:3 | Greeti Greeti Greek Ze functi s: nomin called). unication Nation Ze functi | sonants and the ciation of the 2 ngs, introduc Names ons: using form ative case and n skills: introduction ality and Pr ions: providing | ir correct pr 4 Greek lette cing onese mal and info vocative cas icing onesel ovenance personal de | onunciatic ers; correc If; Prope ormal gree se (singula f using Gr etails such | t pronunciati r Nouns a tings; introc r), personal p eek letters a . as national | ion of dij and Pro ducing o pronouns and word | phtho per nese , ver s. | f us bs ε | digr ing a ίμαι | aphs. 3 affirm (to be | hou ative) and |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communicativ Module:3 Communicativ number; Being | on; cons pronund Greeti Greek /e functi s: nomin called). unication Nation /e functi g able to | sonants and the ciation of the 2 ngs, introduce Names ons: using form ative case and a skills: introduce ality and Pr ions: providing name a few re | ir correct pr 4 Greek lette cing onesel mal and info vocative cas icing onesel ovenance personal de levant land | onunciatio ers; correc If; Prope ormal gree se (singula f using Gr etails such marks in a | t pronunciati r Nouns a tings; introc r), personal p eek letters a as national city. | ion of dij and Pro ducing o pronouns and word ity, addr | phthc per nesel a, ver s. ess a | f us bs c nd to | digr ing a ίμαι | aphs. 3 affirm (to be 5 none | hou ative) and hou |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communicativ Nodule:3 Communicativ number; Being Grammar skills | on; cons pronund Greeti Greek ve functi s: nomin called). unication Nation ve functi g able to s: Comr | sonants and the ciation of the 2 ngs, introduce Names ons: using form ative case and a skills: introduce ality and Pre- tions: providing name a few re- non nouns (ma | ir correct pr 4 Greek lette cing onesel mal and info vocative cas icing onesel ovenance personal de levant landu | onunciationers; correcters; c | t pronunciati r Nouns a tings; introc r), personal p eek letters a as national city. ; feminine in | ion of dip and Pro- ducing o pronouns and word ity, addr $n - \alpha / - \eta;$ | phthc per nesel a, ver s. ess a | f us bs c nd to | digr ing a ίμαι | aphs. 3 affirm (to be 5 none | hou ative) and hou |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communicativ Module:3 Communicativ number; Being Grammar skills + accusative ca | on; cons pronund Greeti Greek /e functi s: nomin called). unication Nation /ve functi g able to s: Comr ase; carc | sonants and the ciation of the 2 ngs, introduce Names ons: using form ative case and a skills: introduce ality and Pr ions: providing name a few re non nouns (ma linal numerals f | ir correct pr 4 Greek lette cing onesel mal and info vocative cas icing onesel ovenance personal de levant landu sculine in -co from 1 to 10 | onunciatio ers; correc If; Prope ormal gree se (singula f using Gr etails such marks in a oς/-ης/-ας); verb μέν | t pronunciati r Nouns a tings; introc r), personal p eek letters a as nationali city. ; feminine in co (simple p | ion of dip and Producing of ducing of pronouns and word ity, addr n - α /- η ; resent). | phtho per nesel , ver s. ess a neute | f us bs e nd to er in | digr ing a íμαι elepl | aphs. 3 affirm (to be 5 none 5 1); $\alpha \pi \alpha$ | hou ative) and hou |
| epsilon-upsil skills: correct Module:2 Communicativ form. Grammar skills μελένε (to be of Written communicativ Module:3 Communicativ number; Being Grammar skills + accusative ca | on; cons pronund Greeti Greek /e functi s: nomin called). unication Nation /ve functi g able to s: Comr ase; carc | sonants and the ciation of the 2 ngs, introduce Names ons: using form ative case and a skills: introduce ality and Pre- tions: providing name a few re- non nouns (ma | ir correct pr 4 Greek lette cing onesel mal and info vocative cas icing onesel ovenance personal de levant landu sculine in -co from 1 to 10 | onunciatio ers; correc If; Prope ormal gree se (singula f using Gr etails such marks in a oς/-ης/-ας); verb μέν | t pronunciati r Nouns a tings; introc r), personal p eek letters a as nationali city. ; feminine in co (simple p | ion of dip and Producing of ducing of pronouns and word ity, addr n - α /- η ; resent). | phtho per nesel , ver s. ess a neute | f us bs e nd to er in | digr ing a íμαι elepl | aphs. 3 affirm (to be 5 none 5 1); $\alpha \pi \alpha$ | hou ative) and hou |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Module:4 | Family | 5 hours |
|---|---|---|
| Communica | tive functions: describing one's family and describing elementary phy | vsical traits |
| (μικρός/μεγ | άλος – μελαχρινός/ξανθός – ψηλός/κοντός). | |
| | ills: possessive pronouns (singular/plural); word accent | |
| | munication skills: describing family and family members. | |
| | | |
| Module:5 | In the classroom: introducing others, languages and nationality adjectives | 4 hours |
| Ccommunic | ative functions: introducing others by providing information on their | nationality and |
| spoken lang | uage(s); naming the objects in a classroom. | |
| Grammar sk | ills: verb μιλώ (simple present); nationality adjectives. | |
| Written com | munication skills: introducing friends and relatives providing specific info | rmation about |
| the language | e they speak. | |
| | | |
| Module:6 | Months and seasons of the year; days of the week; time | 4 hours |
| | and weather | |
| | ive functions: defining time and date; talking about weather conditions. | |
| Grammaral | | |
| | ills: cardinal numerals from 11 to 100; interrogative pronoun (π οιος | |
| | ills: cardinal numerals from 11 to 100; interrogative pronoun (ποιος bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, | |
| time adver | | , πότε); syntax: |
| time adver υποκείμενο | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, | , πότε); syntax: |
| time adver υποκείμενο conditions, d | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. | , πότε); syntax: eather |
| time adver υποκείμενο. conditions, d Module:7 | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine | , πότε); syntax: eather 3 hours |
| time adver υποκείμενο conditions, d Module:7 | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. | , πότε); syntax: eather 3 hour s |
| time adver υποκείμενο conditions, d Module:7 Module cont | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine | , πότε); syntax: eather 3 hour: /hobbies. |
| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities | , πότε); syntax: eather 3 hours /hobbies. uns (nominative |
| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk case). Writte | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities cills: verbs πάω, ακούω, λέω, τρώω, μπορώ (simple present); plural no en communication skills: writing a simple letter describing a daily routine. | , πότε); syntax: eather 3 hours /hobbies. uns (nominative |
| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities tills: verbs πάω, ακούω, λέω, τρώω, μπορώ (simple present); plural no en communication skills: writing a simple letter describing a daily routine. Contemporary issues: | , πότε); syntax: eather 3 hours /hobbies. uns (nominative 2 hours |
| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 Social and E | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities tills: verbs πάω, ακούω, λέω, τρώω, μπορώ (simple present); plural no en communication skills: writing a simple letter describing a daily routine. Contemporary issues: tent: aspects of the 2009-2017 Greek government-debt crisis and of the fugee Crisis. | , πότε); syntax: eather 3 hours /hobbies. uns (nominative 2 hours ne 2015-2018 |
| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 Social and E European Re | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we lefining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities tills: verbs πάω, ακούω, λέω, τρώω, μπορώ (simple present); plural no en communication skills: writing a simple letter describing a daily routine. Contemporary issues: Contemporary issues: Contemporary issues: Total Lecture hours: | , πότε); syntax: eather 3 hour /hobbies. uns (nominative 2 hour ne 2015-2018 |
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| time adver υποκείμενο conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 Social and E European Re Text Book(1. Maria F | bials (τώρα, σήμερα, χθες, αύριο, φέτος πέρσι, τουχρόνου, /άμεσο αντικείμενοWritten communication skills: describing we defining time and date. Daily routine tent: communicative functions: describing one's daily routine and activities tills: verbs πάω, ακούω, λέω, τρώω, μπορώ (simple present); plural no en communication skills: writing a simple letter describing a daily routine. Contemporary issues: conomic aspects of the 2009-2017 Greek government-debt crisis and of the fugee Crisis. Total Lecture hours: | , πότε); syntax: eather 3 hours /hobbies. uns (nominative 2 hours ne 2015-2018 30 hours |
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VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | Т | Р | J | С |
|--|--|---|---------------------------------|---|---|---|
| JAP1001 | JAPANESE FOR BEGINNERS | 2 | 0 | 0 | 0 | 2 |
| Pre-requisite | NIL | | • | | vers | ion |
| ~ | | | V | . 1.0 | | |
| Course Objectives | | | | | | |
| | udents the necessary background to: | | | | | |
| - | basic skills related to reading, listening, speaking and writing Japa | | - | - | | |
| | ners an interest in Japanese language by teaching them culture and | d ger | nerale | etiqu | ettes. | |
| 3. Recognize, re | ead and write Hiragana and Katakana. | | | | | |
| | | | | | | |
| Expected Course | | | | | | |
| Students will be abl | | | | | | |
| 1 | anese alphabets and greet in Japanese. | | | | | |
| - | onouns, verbs form, adjectives and conjunctions in Japanese. | | | | | |
| | e and dates related vocabularies and express them in Japanese. | | | | | |
| 1 | questions and its answers in Japanese. | | | | | |
| 5. Understand the | e Japanese culture and etiquettes. | | | | | |
| | | | | | | |
| Module: 1 | Introduction to Japanese syllables and Greetings | | | 4 | hour | CI III |
| | apanese language, alphabets; Hiragana, katakana, and Kanji F | | | ation | , vov | |
| and consonants. H | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro | | | ation reeti | , vov ngs. | vel |
| and consonants. H Module: 2 | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns | nour | ns, G | ation reeti | , vov ngs. hour | vel |
| and consonants. F Module: 2 Grammar: N1 wa | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So | onour | ns, G | ation reeti 4 | , vov ngs. hour Dore | vel: |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Over | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sorr there, which) Kono, sono, Ano and Dono (this, that, over the second se | onour | ns, G Are a whi | ation reeti 4 and E ch) | , vov ngs. hour Dore Koch | vel: |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Over | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So | onour | ns, G Are a whi | ation reeti 4 and E ch) | , vov ngs. hour Dore Koch | vels s |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Over | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sorr there, which) Kono, sono, Ano and Dono (this, that, over the second se | onour | ns, G Are a whi | 4] ation reetiin and I ch) | hour hour Dore Koch | vels s |
| and consonants. F Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation | ore, Anere, | Are a whi . loca | 4 ation reeti and E ch) | hour hour hour hour | s ira, |
| and consonants. F Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There) | ore, Anere, | Are a whi . loca | 4 ation reeti and E ch) | hour hour hour hour | s ira, |
| and consonants. F Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, Thereward Dochira. this way) Koko, Soko, Asoko and Doko (Here, Thereward Dochira. the set of the se | ore, Anere, | Are a whi . loca | 4 ation reeti and E ch) | hour hour hour hour | s s s |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, Thereward Dochira. this way) Koko, Soko, Asoko and Doko (Here, Thereward Dochira. the set of the se | ore, Anere, | Are a whi . loca | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | hour hour hour hour | s ira, s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure fatakana-reading and writing | nour | Are a whi . loca | ation reeti and I cch) 1 ation ation ace (\$ | , vov ngs. hour Dore Koch) hour Subje | s ira s ct+ |
| and consonants. F Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure atakana-reading and writing Conjunction and Adjectives | nour ore, , nere, re of se | Are a whi . loca | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | , vov ngs. hour Dore Koch) hour Subje | s ira s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor r there, which) Kono, sono, Ano and Dono (this, that, over the nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure atakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase | nour ore, , nere, re of se | Are a whi . loca | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | , vov ngs. hour Dore Koch) hour Subje | s ira s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure atakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for | nour ore, , nere, re of se | Are a whi . loca | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | , vov ngs. hour Dore Koch) hour Subje | s ira s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure atakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for | nour ore, , nere, re of se | Are a whi . loca | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | , vov ngs. hour Dore Koch) hour Subje | s ira s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka things and non-live Module: 5 Days/ Months | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure fatakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ring things Particle- Ka, Ni, Ga Vocabulary and its Meaning /Year/Week (Current, Previous, Next, Next to Next) ; | nour Dre, A nere, re of se - Or r Exi | Are a whi . loca enter | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | hour hour bore Koch) hour asu – livin | s ira. s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka things and non-live Module: 5 Days/ Months | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure tatakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase rimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ving things Particle- Ka, Ni, Ga | nour Dre, A nere, re of se - Or r Exi | Are a whi . loca enter | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | hour hour bore Koch) hour asu – livin | s ira. s ct+ |
| and consonants. H Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) K Module: 4 Conjunction-Ya Sumimasen, waka things and non-live Module: 5 Days/ Months | Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Sor there, which) Kono, sono, Ano and Dono (this, that, over the and Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure fatakana-reading and writing Conjunction and Adjectives nado Classification of Adjectives 'I' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ring things Particle- Ka, Ni, Ga Vocabulary and its Meaning /Year/Week (Current, Previous, Next, Next to Next) ; | nour Dre, A nere, re of se - Or r Exi | Are a whi . loca enter | ation reeti ation (4) (ch) (ch) (ch) (ch) (ch) (ch) (ch) (ch | hour hour bore Koch) hour asu – livin | s ira, s ct+ s s s and |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Te forms, Polite form of verbs

| Μ | odule: 7 | Expressing time, p | osition and dir | ections | 4 hours |
|-------|----------------|--------------------------|------------------|--------------------|----------------------------------|
| Clas | sification o | of question words (Do | ko, Dore, Dono | , Dochira); Time e | expressions (Jikan), Number o |
| hou | rs, Number | of months, calendar o | f a month; Visit | the departmental s | store, railway stations, Hospita |
| (Byo | oki), office a | nd University | | | |
| | | | | | |
| Ν | Iodule: 8 | Guest Lecture by F | Experts | | 2 hours |
| | | Total Lectu | ire hours | | 30 hours |
| Text | Book(s): | | | | |
| 1. | The Japan | Foundation (2017), M | arugoto Japanese | e Language and Cu | lture Starter A1 Coursebook |
| | For Comm | nunicative Language C | ompetences, Nev | v Delhi: Goyal Pub | lishers (9788183078047) |
| 2. | Banno, Er | i et al (2011), Genki: A | Integrated Co | urse in Elementary | Japanese I [Second Edition], |
| Δ. | Japan: The | e Japan Times. | | | |
| Refer | ence Book | (s): | | | |
| 1. | Japanese | for Busy people (2011) | video CD, AJA | LT, Japan. | |
| 2. | Carol and | Nobuo Akiyama (201 | 0), The Fast and | Fun Way, New De | lhi: Barron's Publication |
| | | ¥ | | • | |
| Mode | e of Evalua | tion: CAT, Quiz and | Digital Assign | ments | |
| Reco | mmended l | by Board of Studies | 24-10-2018 | | |
| A | ound by An | ademic Council | No. 53 | Date | 13-12-2018 |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course Code | Course Title | L | Т | Р | J | С |
|--|--|---|---|--|--|---|
| RUS1001 | Russian for Beginners | 2 | 0 | 0 | 0 | 2 |
| Pre- requisites | NIL | | Sylla | bus | vers | ion |
| | | | | v. 1 | .0 | |
| Course Objection 1. To enable industry-r | the students to read and communicate in Russian in their day | /-to- | day l | ife t | o beo | come |
| Expected Outcome 1. The students we life. | ome: will be able to read and communicate the basics of Russian langua | ige i | n thei | ir day | y-to-c | lay |
| Module 1 | Topics | | 3 ho | urs | | |
| | troductions in Russian; Russian alphabet, writing and reading the | Cyri | | | bet. | |
| | rn to: Greet each other in Russian (formal vs. informal; dependin one in Russian. Read and write Cyrillic alphabet | ıg of | the t | ime | of th | e day) |
| Module 2 | Topics | | 3 hou | irs | | |
| | ves/no, gratitude, apologies, saying hello/goodbye, etc.); Number | | | | avs o | of the |
| | f the year; Seasons. Gender of nouns, hard and soft stems, and ex simple conversation. Know numbers, days of the week, months | - | | | e Stu | dents |
| Module 3 | Topics | | 6 hou | urs | | |
| and apartment. | members and pets). Learn Russian names: last name, first name, Parts of the body and health. Personal pronouns; ты vs. вы. Ask pronouns. Asking What and Who in Russian? Nominative | king | Who | se in | | |
| | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demo | h et | с.). Т | The | adjec | here? tives |
| (colors, age, app communicate in | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demonstration Russian. | h eto | c.). T rate b | The asic | adjec | here? tives |
| (colors, age, app communicate in Module 4 Shopping. Food impersonal con | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demo | h et onstr onstr onstr onstr | c.). T rate b 4 hou perso | The pasic | adjec abil | here? ctives ity to ouns, |
| (colors, age, app communicate in Module 4 Shopping. Food impersonal con | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demo Russian. Topics I. Clothes. Demonstrative pronouns этот and тот. Dative case structions. Simple translation (Russian-English-Russian). The | h etconstr onstr onstr of j e Stu | c.). T rate b 4 hou perso | The solution of the solution o | adjec abil | here? ctives ity to ouns, |
| (colors, age, app communicate in Module 4 Shopping. Food impersonal con shopping. Unde Module 5 Travelling. At t word. Place the | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demo Russian. Topics I. Clothes. Demonstrative pronouns этот and тот. Dative case structions. Simple translation (Russian-English-Russian). The rstand a short text in Russian. | h et/onstr onstr e of j s Stu | <pre>c.). T rate b rate b 4 hou perso idents 5 hou ence n to:]</pre> | urs urs nal j s lea with Forn | adjec abil prone rn to the a | here? ctives ity to ouns, o: Do given e and |
| (colors, age, app communicate in Module 4 Shopping. Food impersonal con shopping. Under Module 5 Travelling. At t word. Place the answer general of | ase. The Country and Nationality. Prepositions (in/at/on/with pearance, etc.). The Students learn to: Ask questions and demo Russian. Topics I. Clothes. Demonstrative pronouns этот and тот. Dative case structions. Simple translation (Russian-English-Russian). The rstand a short text in Russian. Topics he airport. Public transportation. Directions. Weather. Form a s sentences into plural form. Formulate questions. The Students | h etdonsti | <pre>c.). T rate b rate b 4 hou perso idents 5 hou ence n to:]</pre> | urs urs onal j s lea with Forn pout | adjec abil prone rn to the a | here? ctives ity to ouns, o: Do given e and |



| (family, univ | versity, house, leisure, etc.) | |
|---------------|---|---------|
| Module 7 | Topics | 4 hours |
| Dialogues: a |) At the airport. b) In a cafeteria, grocery store, farmer's market, etc. | |
| About famil | y - Between friends. | |
| Module 8 | Guest Lectures / native speakers | 2 hours |
| | Total Lecture Hours | 30 |
| | | |
| | | |
| Mode of Ev | valuation: CAT, Quiz and Digital Assignments | |



Specialization Elective

(AY 2022 - 2023)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)

| Sl.No. | Course Code | Course Title | Page No. |
|--------|-------------|-------------------------------------|----------|
| 1. | HUM1046 | Behavioral Economics | 159 |
| 2. | HUM1047 | Engineering Economics | 161 |
| 3. | HUM1048 | Industrial Psychology | 163 |
| 4. | MGT3001 | Business Strategy | 165 |
| 5. | MGT3002 | Advanced Finance | 167 |
| 6. | MGT4004 | Human Resource Management | 169 |
| 7. | MGT4005 | Computational Finance and Modelling | 171 |



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CURRICULUM (2022 - 2023)

| Course code | Course Title | L | TI |) J | | С |
|---------------------------|---|----------------|----------|----------|-------|------|
| HUM1046 | Behavioral Economics | 3 | 0 (| | | 3 |
| Pre-requisite | NIL | S | yllabu | s versi | on | |
| | | | v. | 1.0 | | |
| Course Objectives: | | | | | | |
| - | ledge on current ideas and concepts regarding decision | n mak | ing in | Econ | omi | ics, |
| • | a behavioral science perspective. | | | | | |
| 2. The course will of | explore key departures and the consequences of behavior | of fir | ns, hou | iseholo | ds a | and |
| other economics | entities | | | | | |
| 3. To provide an ove | erview of how behavioral principles have been applied to ec | onomi | c proble | ems. | | |
| | | | | | | |
| Expected Course O | | | | | | |
| 1. Identify and eval | uate evidence for systematic departures of economic behavi | ior fro | m the P | redicti | ons | 3 of |
| the neoclassical | nodel, and psychological explanations for these anomalies | • | | | | |
| 2. Incorporate psyc | chologically motivated assumptions into economic mode | els and | l interp | oret the | e | |
| implications of t | hese assumptions. | | | | | |
| 3. Explain how the | se models change the predictions for equilibrium behavior | and v | velfare | analys | sis a | and |
| assess the implic | ations for optimal policy. | | | | | |
| 4. Compare the pro- | edictions of neoclassical and behavioral models and eval | uate t | he best | tmeth | od | for |
| approaching a gi | ven topic. | | | | | |
| | principles in economic problems. | | | | | |
| | | | | | | |
| Module:1 Intro | luction | | | 6 | ho | urs |
| The neoclassical/star | ndard model and behavioral economics in contrast; historica | al bacl | ground | l; beha | ivio | oral |
| economics and other | er social sciences; theory and evidence in the social sc | iences | and in | n beha | ivio | oral |
| economics; application | ons – gains and losses, money illusion, charitable donation. | | | | | |
| | | | | | | |
| Module:2 Basic | s of Choice Theory | | | 6 | ho | urs |
| Revisiting the neocla | ssical model; utility in economics and psychology; models | of rati | onality | ; conne | ectio | ons |
| with evolutionary b | iology and cognitive neuroscience; policy analysis – co | nsump | otion ar | nd add | icti | on, |
| environmental protec | tion, retail therapy; applications – pricing, valuation, public | goods, | choice | anoma | lies | 3. |
| 1 | | | | | | |
| Module:3 Belief | s, Heuristics and Biases | | | 6 | ho | urs |
| | causal aspects of irrationality; different kinds of biases and | beliefs | : self-e | | | |
| | nsistent and biased beliefs; probability estimation; tradir | | | | | |
| | nancial trading behavior, trade in memorabilia. | -8 " PP | neunor | 10 11 | aae | |
| | | | | | | |
| Module:4 Choic | e under Uncertainty | | | 6 | ho | urs |
| | ected utility theory; prospect theory and other theories; refer | ence n | oints l | | | |
| | ision and probability weighting; applications – ownersh | - | | | | |
| consumption, perfor | | ip and | f trade, | meon | | ina |
| | mare in sports. | | | | | |
| Module:5 Intert | emporal Choice | | | 6 | ho | urs |
| | ng; preferences over time; anomalies of inter-tempor | al dec | risions | | | |
| | ng, protocolocos over time, anomanes or inter-tempor | ui uu | | пурс | .00 | |
| | | | | | | |



VIT Vellore Institute of Technology

CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

discounting; instantaneous utility; alternative concepts – future projection, mental accounts, heterogeneous selves, procedural choice; policy analysis – mobile calls, credit cards, organization of government; applications – consumption and savings, clubs and membership, consumption planning.

Module:6 Game and Strategy Behavior

6 hours

7 hours

Review of game theory and Nash equilibrium – strategies, information, equilibrium in pure and mixed strategies, iterated games, bargaining, signaling, learning; applications – competitive sports, bargaining and negotiation, monopoly and market entry.

Module:7 Social Preference

Individual preferences; choice anomalies and inconsistencies; social preferences; altruism; fairness; reciprocity; trust; learning; communication; intention; demographic and cultural aspects; social norms; compliance and punishment; inequity aversion; policy analysis – norms and markets, labor markets, market clearing, public goods; applications – logic and knowledge, voluntary contribution, compensation design.

Module:8 Contemporary Issues

Guest lectures by Industrial Experts.

Total Lecture hours:

45 hours

2 hours

| - • • • • | (2001(5) |
|-----------|--|
| 1. | N. Wilkinson and M. Klaes, "An Introduction to Behavioral Economics", 2017, 3rd Edition, Red |
| | Globe Press. |

Reference Books

Text Book(s)

| 1. | Bazerman, Max and Don Moore. Judgment in Managerial Decision Making, 2012. 8th Edition, John |
|----|--|
| | Wiley & Sons. |

2. Kahneman, Daniel.Thinking, Fast and Slow, 2011, New York: Farrar, Straus and Giroux.

| Mode of Evaluation: CAT / Written a | assignment / Qui | z / FAT | |
|--|------------------|---------|------------|
| Recommended by Board of Studies | 22-05-2021 | | |
| Approved by Academic Council | No. 62 | Date | 15-07-2021 |



| Course code | | | Cour | se title | | L | Т | Р | J | С |
|---|--|---|---|---|---|--|---|---|---|---|
| HUM1047 | | | Engineering | g Economic | s | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | Ν | IL | | | | Syl | labu | s ver | sio | n |
| | | | | | | | V | .1.0 | | |
| Course Objec | tives: | | | | | | | | | |
| 1. To enable s | students to ide | ntify and exp | lain economi | c concepts a | nd theories rel | ated to t | he be | havi | iouı | r o |
| economic a | agents, market | s, industry an | d firm struct | ures. | | | | | | |
| 2. To enable s | students to ide | ntify the dete | rminants of v | arious macro | oeconomic agg | gregates | such | as c | outp | JU |
| unemployn | nent, inflation | productivity | and the maj | or challenge | s associated w | ith the 1 | neas | urem | nent | t c |
| these aggre | egates. | | | | | | | | | |
| 3. To analyse | cost/revenue of | lata and carry | y out econom | ic analyses t | o justify or reje | ect alter | nativ | es/pi | roje | ect |
| on an econ | omic basis. | | | | | | | | | |
| Expected Cou | irse Outcome | 5: | | | | | | | | |
| 1. Understand | the general pri | nciples of ho | w the market | economy fu | nctions | | | | | |
| 2. Analyse how | w consumers a | nd producers | make decision | ns and learn | about different | market | struc | tures | 5. | |
| 3. To understa | and the genera | l principles | of consumpti | on function | and how an e | economy | / fun | ctior | ns in | n |
| global envi | ronment. | | | | | | | | | |
| 4. Comprehen | d the ways in | which the go | overnment and | d central bar | nk can influend | ce the ec | conor | ny a | nd | th |
| markets thr | ough fiscal an | d monetary p | olicies. | | | | | | | |
| | | | | | | | | | | |
| 5. Evaluate the | e methods of c | | | ate present a | nd future value | es of cas | h flo | ws. | | |
| | e methods of co ojects using pro | ost estimation | n and to estim | ate present a | nd future value | es of cas | h flo | WS. | | |
| | | ost estimation | n and to estim | ate present a | nd future value | es of cas | h flo | ws. | | |
| | ojects using pro | ost estimation | n and to estim l techniques. | ate present a | nd future value | es of cas | h flo | | ho | ur |
| Evaluate pro Module:1 | ojects using pro | ost estimation oject appraisa on to Micro | n and to estim l techniques. economics | | | | | 6 | | |
| Evaluate pro Module:1 Demand and S | ojects using pro Introducti Supply- Consu | ost estimation oject appraisa on to Micro mers' Behav | n and to estim l techniques. economics ior – Indiffer | ence Curve | Analysis- App | | | 6 | | |
| Evaluate pro Module:1 | ojects using pro Introducti Supply- Consu | ost estimation oject appraisa on to Micro mers' Behav | n and to estim l techniques. economics ior – Indiffer | ence Curve | Analysis- App | | | 6 | | |
| Evaluate pro Module:1 Demand and S | Dijects using pro Introduction Supply- Consu Taxes and Sub | ost estimation oject appraisa on to Micro mers' Behav | n and to estim l techniques. economics ior – Indiffer is of changes i | ence Curve | Analysis- App | | | 6 emar | | and |
| 5. Evaluate pro Module:1 Demand and S Supply Model- Module:2 | Dijects using provide the second seco | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production | and to estim techniques. economics ior – Indiffer s of changes i and Cost | ence Curve in income an | Analysis- App d price. | plying th | ne De | 6 emar 6 | nd a | ano ur |
| Evaluate pro Module:1 Demand and S Supply Model- | Dijects using provide the provident of t | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M | and to estim techniques. economics ior – Indiffer s of changes i and Cost | ence Curve in income an | Analysis- App d price. | plying th | ne De | 6 emar 6 | nd a | and ur |
| Evaluate pro- Module:1 Demand and S Supply Model- Module:2 Production Fun | Dijects using provide the provident of t | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M | and to estim techniques. economics ior – Indiffer s of changes i and Cost | ence Curve in income an | Analysis- App d price. | plying th | ne De | 6 emar 6 | nd a | and ur |
| Evaluate pro- Module:1 Demand and S Supply Model- Module:2 Production Fun | Dijects using provide the provident of t | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M ts. | and to estim techniques. economics ior – Indiffer s of changes i and Cost | ence Curve in income an | Analysis- App d price. | plying th | ne De | 6 emar 6 nal C | nd a | and ur ts - |
| Evaluate pro- Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and | Dijects using provident of the second | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. | n and to estim l techniques. economics ior – Indiffer is of changes i and Cost Ainimization; | ence Curve in income an Cost Curves | Analysis- App d price. -Total, Averag | plying th ge and M | ne Do | 6 emar 6 nal C | nd a hor | and ur ts - |
| Evaluate products Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 | Dijects using provident of the second | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. | n and to estim l techniques. economics ior – Indiffer is of changes i and Cost Ainimization; | ence Curve in income an Cost Curves | Analysis- App d price. -Total, Averag | plying th ge and M | ne Do | 6 emar 6 nal C | nd a hor | and ur ts - |
| Evaluate products Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 | Dijects using pro- Introduction Supply- Consuct Taxes and Sub Theory of Contention and Iso- Short Run Cos Market Stration a Firm Under | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. | n and to estim l techniques. economics ior – Indiffer is of changes i and Cost Ainimization; petition; Mono | ence Curve in income an Cost Curves | Analysis- App d price. -Total, Averag | plying th ge and M | ne Do | 6 emar 6 nal C | nd a hor | ur ur |
| Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 | ojects using pro Introducti Supply- Consu Taxes and Sub Theory of action and Iso-o Short Run Cos Market Str a Firm Under Introducti | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M ts. ructure Perfect Comp on to Macro | and to estim l techniques. economics ior – Indiffer s of changes i and Cost dinimization; petition; Mono peconomics | ence Curve in income an Cost Curves | Analysis- App d price. -Total, Averag onopolistic Co | plying the second secon | ne Do Iargin | 6 emar 6 nal C 6 6 | hor hor hor | ur ts - ur |
| Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incor | ojects using pro Introduction Supply- Consund Taxes and Sub Theory of action and Iso-or Short Run Cost Market Str a Firm Under Introduction | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M ts. •ucture Perfect Comp on to Macro mponents- C | and to estim l techniques. economics ior – Indiffer s of changes i and Cost finimization; petition; Mono peconomics GNP, NNP, C | ence Curve in income and Cost Curves opoly and M | Analysis- App d price. -Total, Averag onopolistic Co Consumption | plying the second secon | ne Do Iargin n. | 6 emar 6 nal C 6 6 | hd a hor Cost hor hor trme | and ur ts · ur ur |
| 5. Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incon Simple Keynes | jects using products Introduction Supply- Consurates Taxes and Sub Theory of iction and Iso-or Short Run Cos Market Str a Firm Under Introduction introduction ne and its Cos sian Model of | on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. Perfect Comp on to Macro mponents- C Income Dete | and to estim l techniques. economics ior – Indiffer s of changes i and Cost dinimization; petition; Mone economics GNP, NNP, Commination an | ence Curve in income an Cost Curves opoly and M GDP, NDP; d the Keyne | Analysis- App d price. -Total, Averag onopolistic Co Consumption | plying the second secon | ne Do Iargin n. | 6 emar 6 nal C 6 6 | hd a hor Cost hor hor trme | and ur ts - ur ur |
| Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incor | jects using products Introduction Supply- Consurates Taxes and Sub Theory of iction and Iso-or Short Run Cos Market Str a Firm Under Introduction introduction ne and its Cos sian Model of | on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. Perfect Comp on to Macro mponents- C Income Dete | and to estim l techniques. economics ior – Indiffer s of changes i and Cost dinimization; petition; Mone economics GNP, NNP, Commination an | ence Curve in income an Cost Curves opoly and M GDP, NDP; d the Keyne | Analysis- App d price. -Total, Averag onopolistic Co Consumption | plying the second secon | ne Do Iargin n. | 6 emar 6 nal C 6 6 | hd a hor Cost hor hor trme | and ur ts - ur ur |
| 5. Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incon Simple Keynes | Introducti Supply- Consu Taxes and Sub Theory of action and Iso-o Short Run Cos Market Str a Firm Under Introducti me and its Co sidies; External | on to Micro on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. Perfect Comp on to Macro mponents- C Income Dete Sector -Expo | and to estim l techniques. economics ior – Indiffer s of changes i and Cost dinimization; petition; Mone economics GNP, NNP, Commination an | ence Curve in income an Cost Curves opoly and M GDP, NDP; d the Keyne rts; | Analysis- App d price. -Total, Averag onopolistic Co Consumption | plying the second secon | ne Do Iargin n. | 6 emar 6 nal C 6 6 0 vvsst nt So | hd a hor Cost hor hor trme | ur ts · ur ur ent or |
| 5. Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incon Simple Keynes Taxes and Subs Module:5 | introduction introduction introduction introduction introduction introduction introduction inter and its Constant introduction introd | ost estimation oject appraisa on to Micro mers' Behav sidies- Effect Production juants-Cost M ts. Perfect Comp on to Macro mponents- C Income Dete Sector -Expo odel and Bus | and to estim l techniques. economics ior – Indiffer s of changes i and Cost Animization; petition; Mono economics GNP, NNP, Cormination an orts and Impo siness Cycles | ence Curve in income and Cost Curves opoly and M GDP, NDP; d the Keyne rts; | Analysis- App d price. -Total, Averag onopolistic Co Consumption sian Multiplie | plying the second secon | ne Do Iargin n. | 6 emar 6 nal C 6 1vest nt Se 7 | hor hor hor hor hor hor hor | ur ts - ur ent or ur |
| 5. Evaluate pro Module:1 Demand and S Supply Model- Module:2 Production Fun Long Run and Module:3 Equilibrium of Module:4 National Incon Simple Keynes Taxes and Subs | introducti Supply- Consu Taxes and Sub Theory of iction and Iso-o Short Run Cos Market Str a Firm Under Introducti me and its Co sidies; External IS-LM Me itions; Demar | on to Micro mers' Behav sidies- Effect Production puants-Cost M ts. Perfect Comp on to Macro mponents- C Income Dete Sector -Expo odel and Bus d for Money | and to estim l techniques. economics ior – Indiffer s of changes i and Cost finimization; betition; Mone betition; Mone beconomics GNP, NNP, Cormination an orts and Impo siness Cycles -Supply of N | ence Curve in income an Cost Curves opoly and M GDP, NDP; d the Keyne rts; Aoney - Ban | Analysis- App d price. -Total, Averag onopolistic Co Consumption sian Multiplie k's Credit Crea | plying the second secon | ne Do fargin n. on; Iu rnme | 6 emar 6 nal C 6 6 0 vest nt Se 7 7 ier; 1 | hor hor hor hor hor IS I | ur ts ur ur ent or ur |



VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Mo | dule:6 | Engineering Economics | and Cost Estimat | tion | | 6 hours |
|------|-----------------|-------------------------------|----------------------------------|-------------------------|----------------|----------------------------|
| En | gineering Eco | nomics and Decision Maki | ing- Cost Concept | s- Life Cy | cle Costing - | Cost Estimation |
| Tee | chniques - Par | ametric and Non-Parametric | techniques. | | | |
| | | | | | | |
| Mo | odule:7 | Foreign Exchange Rates | | | | 6 hours |
| De | termination – | effects- exchange rate regime | e: fixed, flexible, fl | loating rate | s- methods of | foreign payments |
| — is | sues in Foreig | n exchange reserves. Interna | tional Competitive | Bidding- Is | ssues. | |
| | | - | | | | |
| Mo | odule:8 | Contemporary issues | | | | 2 hours |
| Gu | est lectures by | Industrial Experts. | | | | |
| | | | | Total Le | cture hours: | 45 hours |
| Te | xt Book(s) | | | | | |
| 1. | Samuelson, | Paul.A and William Nordhau | is, "Economics", 20 | 019, 20 th E | dition, McGrav | w Hill Publishers, |
| | New Delhi. | | | | | |
| Re | ference Book | S | | | | |
| 1. | Sullivan G | William, Elin M Wicks and | d C. Patrick Koell | ing, "Engi | neering Econo | omv", 2018, 17th |
| | | rson Education. | | 0, 0 | 0 | J J J J J J J J J J |
| 2. | , | ey M, "Microeconomics", 20 | 019, 7 th Edition, Pe | arson Educ | ation. | |
| | | <u> </u> | | | | |
| M | ode of Evalua | ation: CAT / Assignment | / Quiz / FAT / Pr | oject / Se | minar | |
| Da | commended | by Board of Studies | 22-05-2021 | | | |
| ке | | • | | | | |





| Course Code | Course Title | | L | Τ | Ρ | J | С |
|-------------------------------|--|-----------------|-------|-------|-------------|-------|--------|
| HUM1048 | Industrial Psychology | | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | NIL | NIL | | | | | |
| | | | | | v. 1 | 0.1 | |
| Course Objectives: | | | | | | | |
| 1. Introduces studen | s to the content areas of industrial psychology | and the applic | catic | on of | | | |
| • • | ry to organizational issues. Acquiring knowled nt and selection, training, performance apprais fety. | 0 1 | | - | • | | |
| 3. Using an applied managers. | approach, this course will help prepare stud | lents for their | role | es as | emp | oloye | es an |
| | | | | | | | |
| Expected Course O | itcomes: | | | | | | |
| 1. Become convers | ant about the major content areas of Indu | strial Psychol | logy | (i.e | ., jo | b an | nalysi |

- 1. Become conversant about the major content areas of Industrial Psychology (i.e., job analysis, recruitment, selection, employment law, training, performance management, and health/well-being issues in the workplace).
- 2. Gain further comfort with statistical concepts in the context of making personnel decisions to reinforce content learned in PSY203 or an equivalent introductory statistics course.
- 3. Gain practical experience by completing a series of hands-on projects involving job analysis, selection decisions, training programs, and employee well-being.
- 4. Deepen your understanding of tests and measurements so that you can collect accurate information and make sound data-based decisions.
- 5. Prepare for other focused seminar courses in Industrial/Organizational Psychology or Human Resource Management.

| Module:1 | Introduction | 8 hours |
|-----------------|---|--------------------------|
| I/O Psycholog | y-definition. Research Methods, Statistics, and Evidence-based I | Practice, Introduction & |
| Legal Context | t of Industrial Psychology, Job Analysis & Competency Model | lling, Job Evaluation & |
| Compensation, | Job Design & Employee Well-Being, Recruitment. | |
| Module:2 | Evaluating the Quality of Performance Measures | 7 hours |
| Identifying Cri | teria & Validating Tests and Measures, Screening Methods, Intensive | e Methods. |
| | | |
| Module:3 | Employees Performance and Evaluation | 5 hours |
| Performance (| Goals and Feedback, Performance Coaching and Evaluation, | Evaluating Employee |
| Performance. | | |
| Module:4 | Organisational Fairness and Diversity Management | 6 hours |
| | ivation, Satisfaction and Commitment, Fairness and Diversity. | 0 110415 |
| | | |
| Module:5 | Leadership and Organisational Development | 6 hours |
| Leadership, Or | ganizational Climate, Culture, and Development. | |
| Module:6 | Organisational Behaviour | 6 hours |
| Mouule.0 | Organisational Denaviour | 0 11001 5 |





| Tear | ns in Orga | nizations, The Organization | of Work Behaviou | r | | |
|-------|------------|----------------------------------|--------------------|-------------|-------------------------------|-------------------------------|
| Mod | lule:7 | Stress Management | | | | 5 hours |
| Stres | ss Manage | ment: Demands of Life and V | Vork | | | |
| Mod | lule:8 | Contemporary issues | | | | 2 hours |
| Gue | st Lecture | by Industry experts | | | | |
| | | | To | tal Lectur | re hours: | 45 hours |
| Tex | t Book(s) | | | | | |
| 1. | Landy, | F. J. and Conte, J. M. Wor | k in the 21st Ce | ntury,2013 | 3, 4 th Edition. C | Oxford: Blackwell |
| | Publishi | ng. | | | | |
| 2. | Aamodt | , M. Industrial/Organization | nal Psychology: | An Appli | ed Approach,20 | 015, 8 th Edition, |
| | Wadswo | rth Publishing Co. | | | | |
| Refe | erence Bo | oks | | | | |
| 1. | Miner.B | , J. Industrial-Organizational I | Psychology. 1992, | McGraw H | Hill Inc., US. | |
| 2. | Ashwatl | nappa, K. Human Resource | Management: Te | xt & Case | es,2017,8th Edit | ion, McGraw Hill |
| | Education | on. | | | | |
| Mo | de of Eva | luation:CAT / Assignmen | t / Quiz / FAT / I | Project / S | Seminar | |
| Rec | ommende | ed by Board of Studies | 22-05-2021 | | | |
| App | roved by | Academic Council | No. 62 | Date | 15-07-2021 | |



| Course cod | le | Course title | L | Т | P | J | С |
|---|----------|---|-------|---------|---------|--------|-------|
| MGT3001 | l | Business Strategy | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | | NIL | | Syllat | | | 'n |
| ~ | | | | | v. 1.0 |) | |
| Course Objecti | | | | | | •.• | 1 |
| | | concepts of strategic management and understand its na | ture | in co | mpet | itive | and |
| institutional | | | 1 | • | 41 | | |
| - | | tic approach to see business issues comprehensively an nowledge for decision-making. | a us | sing o | uner | core | and |
| | - | rpret the critical challenges and opportunities before an org | anize | ation | | | |
| 5. To identify a | | appet the entited chancinges and opportunities before an org | amza | uion. | | | |
| Expected Cour | se Ou | tcome: | | | | | |
| | | tal concepts of strategic management to analyze business si | tuati | ons a | nd ap | ply t | these |
| | | usiness problems. | | | - | | |
| 2. Understand t | the fun | damental principles of and interrelationships among bus | ines | s func | tions | suc | h as: |
| R&D, produc | ction, r | narketing, finance, HR and information technology | | | | | |
| 3. Understand t | the inte | er-relationships of business to individuals, other organiz | atio | ns, go | verni | nent | and |
| society. | | | | | | | |
| | | of strategic analysis thoroughly, how they are used, an | d w | here t | they | fit ii | n the |
| managerial pr | rocess t | o frame and implement strategies. | | | | | |
| | T | | | | | 01 | |
| | | luction to Strategic Management Management, Vision and Objectives, Schools of thought in | a Str | otogio | Mon | | ours |
| - | - | cess, and Practice, Fit Concept and Configuration Perspe | | - | | - | nent, |
| Management | n, 1100 | cess, and Fractice, Fit Concept and Configuration Ferspe | | / III S | inateg | ,ic | |
| | | | | | | | |
| Module:2 | Interr | al Environment of Firm- Recognizing a Firm's Intellec | tua | Asse | ts | 7 h | ours |
| Core Competen | ce as tl | ne Root of Competitive Advantage, Sources of Sustained | Com | petiti | ve A | dvan | tage, |
| Business Process | ses and | Capabilities-based Approach to Strategy | | | | | |
| | | | | | | ~ = | |
| I | | nal Environments of Firm- Competitive Strategy | | 1 | ~ ~ ~ d | | ours |
| | naustry | Attractiveness that Shape Strategy, The concept of Strategy | gic C | broup | s, and | ma | ustry |
| Life Cycle | | | | | | | |
| Module:4 | Gener | ic strategies | | | | 5 h | ours |
| | | eric Strategies and the Value Chain | | | | 0 1 | |
| | , | | | | | | |
| Module:5 | Corpo | rate Strategy, and Growth Strategies | | | | 6 h | ours |
| The Motive for | Diversi | fication, Related and Unrelated Diversification, Business Po | rtfol | io An | alysis | | |
| | ~ | | | | | | |
| Module:6 | | sting with competitors in overseas markets | | 1 | M | | ours |
| - | gration | and Diversification, Strategic Alliances, Joint Ventu | ires, | and | Mer | gers | Č. |
| Acquisitions | | | | | | | |
| Module:7 | Strate | gy Implementation: Structure and Systems | | | | 5 h | ours |
| mouule./ | Suate | 57 mprementation, su ucture and systems | | | | 51 | .vu13 |





| Mo | dule:8 | Contemporary issues | | | | 2 hours |
|-----|---------------|--------------------------------|---------------------|--------------|------------------------|--------------|
| Gu | est lecture b | y Industry Experts or R&D of | organization | | | |
| | | | | To | tal Lecture hours: | 45 hours |
| Te | xt Book(s) | | | | | |
| 1. | Strategic n | nanagement of technological | innovation (2019), | Schilling, | M. A., & Shankar, R,N | /IcGraw-Hill |
| | Education | | | | | |
| 2. | The busine | ess of platforms: Strategy in | the age of digital | competitio | on, innovation, and po | ower (2019), |
| | Cusumano | , M. A., Gawer, A., & Yoffie | , D. B., New York: | Harper Bus | siness. | |
| Ref | ference Boo | oks | | | | |
| 1. | Dislodging | multinationals: India's strate | egy in comparative | e perspectiv | e (2019), Encarnation | , D.Cornell, |
| | University | Press. | | | | |
| 2. | Dynamics | of knowledge intensive entre | preneurship: Busin | ess strategy | and public policy (20 | 18), |
| | Malerba, F | ., Caloghirou, Y., McKelvey, | M., & Radoševic, | S. (Eds.), R | outledge. | |
| Mo | de of Eval | uation: CAT / Assignmer | nt / Quiz / FAT / I | Lab | | |
| Ree | commende | d by Board of Studies | 29-01-2021 | | | |
| | | Academic Council | No. 61 | Date | 18-02-2021 | |





| Course C | | Course Title | L | T | P | J | <u>C</u> |
|--|--|---|---------|---------------------|---------------|--|----------------------|
| MGT30 | 02 | Advanced Finance | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | | NIL | | Syllab | | sion | |
| Course Obies | timoge | | | ١ | v. 1.0 | | |
| Course Objec | | about the decisions and decision variables involved with | h fina | ncial | otiviti | es of | th |
| firm. | ownedge a | about the decisions and decision variables involved with | 1 11110 | uiciai a | | 65 01 | un |
| | kills for i | nterpretation business information and application of fir | anci | al than | ry in a | orno | •ot |
| - | | ns, with special emphasis on working capital managem | | | I y III (| Jorpo | au |
| | | idents with the corporate and financial restructuring. | CIII. | | | | |
| J. Tammanz | ing the st | dents with the corporate and imanetal restructuring. | | | | | |
| Expected Cou | rse Outc | ome: | | | | | |
| 1. Informing | the stude | ents about the various financial instruments and make th | em u | nderst | and at | out t | ne |
| Corporate | Dividend | d decisions, is the main objective. | | | | | |
| 2. The Leasin | ng and deo | cisions involving Leasing shall make the students achiev | e the | Organ | izatior | nal go | als |
| with optin | | | | | | | |
| | - | udents with the corporate and financial restructuring. | | | | | |
| - | | interpretation of business information and applicati | | | | heory | ' i |
| | | nt decisions, with special emphasis on working capital | mana | agemen | nt. | | |
| 5. Giving the | basic kno | owledge about the Derivatives. | | | | | |
| | | | | | | | |
| Modulo-1 | Intro | duction | | | | 4 ho | |
| Module:1 | | duction | ing t | he can | ital ir | 4 ho | |
| Sources of Fu | nds (inclu | duction Iding regulatory framework)-Types of securities-Issu n of Stocks and bonds | ing t | he cap | ital in | | |
| Sources of Fu Pricing of issue | nds (inclu -Valuatio | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds | ing t | he cap | ital in | mar | ke ⁻ |
| Sources of Fun Pricing of issue Module:2 | nds (inclu -Valuatio | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: | | | | 6 ho | ke ui |
| Sources of Fun Pricing of issue Module:2 Traditional Ap | nds (inclu -Valuatio Divide proach, D | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds | | | | 6 ho | ke u |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid | nds (inclu -Valuatio Divide proach, D ends, Issu | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod te of bonus shares, Stock Split | | | | 6 ho | ke u |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 | nds (inclu -Valuatio Divide proach, D ends, Issu Leasin | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: ividend Relevance Model, Miller and Modigliani Mod a of bonus shares, Stock Split ng Contracts | | | | 6 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid | nds (inclu -Valuatio Divide proach, D ends, Issu Leasin | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: ividend Relevance Model, Miller and Modigliani Mod a of bonus shares, Stock Split ng Contracts | | | | 6 ho ivider | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I | nds (inclu -Valuatio Divide proach, D ends, Issu Lease Con | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod ue of bonus shares, Stock Split ng Contracts tracts | | | | 6 ho ivider | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of L Module:4 | Divide Divide proach, D ends, Issu Lease Con Corpo | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: ividend Relevance Model, Miller and Modigliani Mod ie of bonus shares, Stock Split ng Contracts tracts orate Restructuring | el, S | tability | of D | 6 ho 6 ho 6 ho | ke un un un |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A | Divide Divide proach, D ends, Issu Lease Con Corpo | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod ue of bonus shares, Stock Split ng Contracts tracts | el, S | tability | of D | 6 ho 6 ho 6 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A | Divide Divide proach, D ends, Issu Lease Con Corpo | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod ne of bonus shares, Stock Split ng Contracts tracts brate Restructuring ms- Types of Mergers, Evaluation of Merger Proposal- | el, S | tability | of D | 6 ho 6 ho 6 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A | nds (inclu -Valuatio Divide proach, D ends, Issu Lease Con Corpo cquisitior put-Manag | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod ne of bonus shares, Stock Split ng Contracts tracts brate Restructuring ms- Types of Mergers, Evaluation of Merger Proposal- | el, S | tability | of D | 6 ho 6 ho 6 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A Leverage buy-co Module:5 | nds (inclu Valuatio Divide proach, D ends, Issu Lease Con cquisitior put-Manag | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod a of bonus shares, Stock Split ng Contracts tracts brate Restructuring ms- Types of Mergers, Evaluation of Merger Proposal- gement buy-out-Corporate Failure and Liquidation | el, S | tability | of D | 6 ho ivider 6 ho amati | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A Leverage buy-co Module:5 Share Split-Con | Divide Divide proach, D ends, Issu Lease Con Corpo cquisitior put-Manag | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: ividend Relevance Model, Miller and Modigliani Mod ie of bonus shares, Stock Split ng Contracts tracts brate Restructuring ns- Types of Mergers, Evaluation of Merger Proposal- gement buy-out-Corporate Failure and Liquidation cial Restructuring n-Cancellation of Paid-up Capital-Other Mechanisms | el, S | tability | of D | 6 ho ivider 6 ho amati 4 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of I Module:4 Mergers and A Leverage buy-co Module:5 Share Split-Con Module:6 | Divide Divide Divide proach, D ends, Issu Lease Con cquisition out-Manag Finance solidation | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod te of bonus shares, Stock Split ng Contracts tracts tracts orate Restructuring ns- Types of Mergers, Evaluation of Merger Proposal- gement buy-out-Corporate Failure and Liquidation cial Restructuring n-Cancellation of Paid-up Capital-Other Mechanisms ing Capital Management: | el, Si | tability | of D | 6 ho ivider 6 ho amati 4 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of L Module:4 Mergers and A Leverage buy-co Module:5 Share Split-Con Module:6 Working Capi | Divide Divide proach, D ends, Issu Lease Conpo cquisition put-Manag Finance solidation Work tal Plann | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: ividend Relevance Model, Miller and Modigliani Mod a of bonus shares, Stock Split ng Contracts tracts brate Restructuring ns- Types of Mergers, Evaluation of Merger Proposal- gement buy-out-Corporate Failure and Liquidation cial Restructuring n-Cancellation of Paid-up Capital-Other Mechanisms ing Capital Management: ing-Monitoring and Control of Working Capital-We | Take | tability -over-A | of D Amalg | 6 ho ivider 6 ho amati 4 ho 11 ho | |
| Sources of Fun Pricing of issue Module:2 Traditional App Forms of Divid Module:3 Evaluation of L Module:4 Mergers and A Leverage buy-co Module:5 Share Split-Con Module:6 Working Capi | Divide Divide proach, D ends, Issu Lease Conpo cquisition put-Manag Finance solidation Work tal Plann | ading regulatory framework)-Types of securities-Issu n of Stocks and bonds end Decisions: vividend Relevance Model, Miller and Modigliani Mod te of bonus shares, Stock Split ng Contracts tracts tracts orate Restructuring ns- Types of Mergers, Evaluation of Merger Proposal- gement buy-out-Corporate Failure and Liquidation cial Restructuring n-Cancellation of Paid-up Capital-Other Mechanisms ing Capital Management: | Take | tability -over-A | of D Amalg | 6 ho ivider 6 ho amati 4 ho 11 ho | |





| Mo | dule 7 | Introduction to derivativ | ves 🛛 | | | 6 hours |
|------|---------------|--------------------------------|-------------------|---------------|------------------|-------------------|
| Bas | ics of Future | s, Forwards, Options, Swap | s-Interest rate I | Payoff Diagra | ams, Pricing of | Futures, Put Call |
| Pari | ty, Option Pr | icing using Binomial Model | and Black Scho | oles Model-U | se of Derivative | s for Risk-Return |
| Maı | nagement- Cre | edit Default Swaps | | | | |
| | | _ | | | | |
| Mo | dule 8 | Recent Trends | | | | 2 hours |
| Cor | ntemporary Is | sues in Finance | | | | |
| | - · · | | | Total L | ecture Hours | 45 Hours |
| Tex | xt Books: | | | | | |
| 1. | Brealey, My | ers and Allen, Principles of G | Corporate Finan | ce, McGraw | Hill Education (| 2018) |
| 2. | I.M. Pandey. | , Corporate Finance, Vikas P | ublishing House | e (2015) | | |
| Mo | de of Evalu | ation: CAT / Assignment | /Quiz/FAT | . , | | |
| | | by Board of Studies | 29-01-2021 | | | |
| | | cademic Council | No. 61 | Date | 18-02-2021 | |





| 1.0000 | de | | | se Title | | | | L | T | P J | C |
|-------------------------|-----------------|--|-------------|--------------|------------|-----------|-----------|------------|--------------|---------|------------|
| MGT400 | | Huma | n Resour | rce Man | agement | t | | 3 | 0 | 0 0 | - |
| Pre-requisit | e NIL | | | | | | | | Sylla | abus ve | ersion |
| <u> </u> | | | | | | | | | | v.1.0 | |
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| | | RM concepts i | | | | iman Ke | source r | viana | igen | lent | |
| | | ctivities lead to | 0 | | | bility of | the orac | nico | tion | | |
| J. Understand | | cuvilles leau u | | ance and | sustamat | Jinty OI | the orga | inisa | uon. | | |
| Expected C | ourse Outcor | ne: | | | | | | | | | |
| - | | ncepts of HRN | M | | | | | | | | |
| | | tions and activ | | ganisatio | ons | | | | | | |
| 3. Align HRM | I activities wi | th real time or | ganisation | al enviro | nment. | | | | | | |
| 4. Comprehe | nd cross-cultu | ral work dynar | nics and H | HR activi | ties. | | | | | | |
| 5. Understand | l the impact c | f HR activities | s on differ | rent caree | er outcom | nes | | | | | |
| | | | | | | | | | | | |
| Module:1 | | source Manag | 2 | | | | | | | | 8 hou |
| | urce Manage | ement: Conce | pt and C | Challenge | es, HR I | Philosop | ohy, Po | licie | s, P | rocedu | res and |
| Practices. | | | | | | | | | | | |
| M112 | II D | | | | | | | | | | <u>(</u>] |
| Module:2 | | source System | 9 | ~~~~ 1 | | h:1:4-, : | UDM | <u>Маа</u> | | n a LID | 6 hour |
| | | Department, Li audit; Human r | - | - | - | • | HKM, | wiea | suri | ng HR, | , Huma |
| icsources acc | ounting and a | iuuni, muinain i | | normatic | ii system | | | | | | |
| Module:3 | Functional | Areas of HRN | M | | | | | | | | 6 hou |
| | | , benefits, cor | | on, empl | oyee rela | ations, H | HR com | plia | nce, | organ | |
| | U | pment, human | - | · • | • | | | • | | 0 | |
| | | | | | | | | | | | |
| Module:4 | Human Res | source Planni | ng | | | | | | | | 6 hour |
| Demand Fore | casting, Actio | on Plans- Rete | ntion, Trai | ining, Re | deploym | ent & St | affing, S | Succ | essic | on Plan | ning |
| | | | | | | | | | | | |
| Module:5 | - | lanagement o | | | | | | | | | 6 hour |
| | ionship betw | een HR strate | gy and ov | verall co | rporate s | trategy, | HR as a | a Fa | ctor | of Con | npetitiv |
| Advantage | | | | | | | | | | | |
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| Module:6 | 0 0 | Diverse and in | | | | tax Mana | ~~~~ | C. | <u>a: a1</u> | Darrah | 6 hou |
| | of Workforce | al Diversity, C | nobal Co | mext IO | Diversi | iy Mana | igement | , 30 | cial | rsych | Jogica |
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| reispectives | | | | | C t | | | | | | 5 hour |
| - | Human Res | source Manao | rement in | Service | Sector | | | | | | 5 0000 |
| Module:7 | | ource Manag – Employee J | / | | | Owerme | ent and | Cus | tom | er Sati | 5 hour |
| Module:7 Managing th | e Customer - | ource Manag – Employee In omer Recover | nteraction | n, Emplo | yee Emp | | | | | | sfaction |





| Mo | dule:8 | Contemporary issues | | | | 2 hours |
|-----|-----------------|------------------------------|----------------|------------|-----------------------|-------------------|
| Exp | pert lectu | re on Recent trends | | | · | |
| | | | Tota | al Lecture | hours: | 45 hours |
| Tex | t Book(| s) | | | 1 | |
| 1. | Dessl | er G, Varrkey B. Human Reso | urce Manageme | ent, 2020, | 16th edition. Pearso | n Education India |
| Ref | erence E | Books | | | | |
| 1. | Josep | h J. Martocchio, Human Re | esource Mana | gement, 2 | 019, 15th edition, | Pearson Education |
| | Charr | npaign. | | | | |
| 2. | Mathi | s RL, Jackson JH. Human reso | ource managem | ent, 2021, | 15th edition, Jakarta | : SalembaEmpat. |
| | | | | | | |
| Mo | de of Ev | valuation: CAT / Assignme | nt / Quiz / FA | T/Lab | | |
| Rec | commen | ded by Board of Studies | 22-05-2021 | | | |
| | | y Academic Council | No. 62 | Date | 15-07-2021 | |





| | de | Course Title | L | Т | P | J | С |
|---|--|--|---|--|--|---|---|
| MGT4005 | 5 | Computational Finance & Modeling | 3 | 0 | 2 | 0 | 4 |
| Pre-requisite | | NIL | | Syll | abus | vers | ion |
| | | | | | v. 1 | 1.0 | |
| Course Objec | tives: | | | | | | |
| 1. To study fina | ancial | data analysis and modelling | | | | | |
| 2. To acquire q | uantita | tive finance skills, application of tools and techniques | | | | | |
| 3. To advance l | knowl | edge in designing, developing and testing of computational fi | nanc | e mo | dels | | |
| Expected Cou | ırse O | utcome: | | | | | |
| 1. Ability to ana | alyse f | inancial data | | | | | |
| 2. Understand t | the ma | thematical foundations of finance | | | | | |
| 3. Knowledge of | of fina | ncial markets and instruments | | | | | |
| 4. Understand of | option | pricing models and its applications | | | | | |
| 5. Measuring an | nd ma | naging various types of financial risks | | | | | |
| 6. Design and t | test co | mputational finance models | | | | | |
| | | | | | | | |
| Module:1 | Fina | ncial Markets and Instruments | | | | | 7 hour |
| Financial Prod | ucts a | nd Markets: Introduction to the financial markets and the pr | oduc | cts w | hich | are tr | aded i |
| them: Equities, | , indico | es, foreign exchange, and commodities. Options contracts an | d str | ategi | es fo | r spe | culation |
| and hedging-an | | | | • | | - | |
| Statistical Anal | lysis of | Financial Returns: Fat-tailed and skewed distributions, outlie | rs, st | ylize | d fac | ts. | |
| Module:2 | Mat | hematical Finance | | - | | | 7 hour |
| Numerical met | thods | relevant to integration, differentiation and solving the parti | al di | ffere | ntial | equa | tions o |
| | | : examples of exact solutions including Black Scholes and it | | | | | |
| | | gorithms and question of stability and convergence, treatmer | | | | | |
| conditions, the | conne | ction with binomial models, interest rate models, early exercise | cise, | and t | he co | orresp | onding |
| free boundary j | proble | ms, and a brief introduction to numerical methods for solvin | g mu | ılti-fa | ctor | mode | ls |
| | D • | ins, and a other introduction to numerical methods for solving | | | | | |
| Module:3 | Fina | ncial derivatives | | | | , | 7 hour |
| | | ncial derivatives | ut-ca | all pa | rity. | | |
| Black-Scholes | framev | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p | | - | • | The I | PDE fo |
| Black-Scholes t | framev odity a | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D | igita | l opti | ons. | The H | PDE fo Greeks |
| Black-Scholes t pricing commo theta, delta, ga | framev odity a umma, | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of | igita early | l opti y exe | ons. rcise | The H The (- Ar | PDE fo Greeks nerica |
| Black-Scholes the pricing common theta, delta, ga options: perpet | framev odity a umma, tual ca | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of alls and puts; optimal exercise strategy and the smooth pa | igita early | l opti y exe | ons. rcise | The H The (- Ar | PDE fo Greeks nerica |
| Black-Scholes the pricing common theta, delta, ga options: perpet | framev odity a umma, tual ca - actua | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of | igita early | l opti y exe | ons. rcise | The H The (- Ar n. Vo | PDE fo Greeks nerican platility |
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| Black-Scholes the pricing common theta, delta, ga options: perpet considerations - Module:4 Simulation inc | framey odity a umma, tual ca - actua Data cluding | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of alls and puts; optimal exercise strategy and the smooth pa 1, historical, and implied volatility. a simulation and analysis g random variable generation, variance reduction methods | igita early sting and | l opti y exe g con | ons. orcise ditio stica | The F The - Ar n. Vo 2 1 ana | PDE fo Greeks nericat blatility 7 hour lysis o |
| Black-Scholes the pricing common theta, delta, ga options: perpeter considerations - Module:4 Simulation incomplete simulation output the simulation out | framevo dity a umma, tual ca - actua Data cluding put. Ps | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of alls and puts; optimal exercise strategy and the smooth pa l, historical, and implied volatility. a simulation and analysis g random variable generation, variance reduction methods eudo random numbers, Linear congruential generator, Merse | igita early sting and enne | l opti y exe g con stati twist | ons. rcise ditio stica er R | The I The C - Ar n. Vo I ana NG. 7 | PDE fo Greeks nericat blatility 7 hour lysis o The us |
| Black-Scholes the pricing common theta, delta, ga options: perpeter considerations - Module:4 Simulation incomplete simulation output of Monte Carlo | framevo dity a umma, tual ca - actua Data cluding put. Ps | ncial derivatives work: Black-Scholes PDE: simple European calls and puts; p nd currency options. Discontinuous payoffs - Binary and D vega& rho and their role in hedging. The mathematics of alls and puts; optimal exercise strategy and the smooth pa 1, historical, and implied volatility. a simulation and analysis g random variable generation, variance reduction methods | igita early sting and enne | l opti y exe g con stati twist | ons. rcise ditio stica er R | The I The C - Ar n. Vo I ana NG. 7 | PDE fo Greeks nerican blatility 7 hour lysis o The us |
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| | ule:6 | Options and applications | | <u> </u> | | | 4 hours |
| | | eas include the pricing of Am | - | - | - | - | |
| | | f importance sampling for M | | simulatio | n of VaR for | portfolios of optic | |
| | ule:7 | Options and alternative r | | | | | 5 hours |
| - | - | ing in incomplete markets, A | - | - | - | - | |
| | | esses, High-dimensional cova | ariance mati | rices, Ext | reme value the | eory, Statistical A | 0 |
| | ule:8 | Contemporary Issues | | | | | 2 hours |
| Indus | stry exper | t Lecture on recent trends | | | | | |
| | | |] | Total Lec | ture Hours | | 45 hours |
| | Book(s) | | | | | _ | |
| 1. | | ilmott, Paul Wilmott on Quan | | | | | • |
| 2. | - | enitz and Daniel Wetterau, F | | - | Theory, Imple | mentation and Pr | actice with |
| | | AB, 2012, 1 st edition, Wiley F | inance Serie | es. | | | |
| Refe | rence Bo | | | | | | |
| 1. | | fanica., A Primer for the Ma | thematics C | Of Financi | al Engineerin | g, 2011, 2 nd Editi | on FE Press, |
| | New Y | | | | | | |
| 2. | | Hull and Sankarshan Basu, (| Options, fut | ures & ot | her derivative | s, 2018, 10 th editi | on, Pearson |
| | India. | | | | | | |
| 3. | | uey S. Analysis of Financial T | | | | | |
| 4. | - | el: Tools for Computational I | | | | | |
| 5. | David I | Ruppert, Statistics and Data A | nalysis for | Financial | Engineering, | 2011, Springer. | |
| | | | | | | | |
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| | | uation: CAT / Assignment | / Quiz / FA | AT / Proj | ect / Seminar | | |
| List o | of Exper | iments | | | | | |
| List of The f | of Exper | ments lab experiments could be pla | nned on M | ATLAB-0 | Computationa | Finance suite. | |
| List The f 1. | of Exper following Workin | ments lab experiments could be pla g with financial market data: | nned on M data impor | ATLAB-(t, charting | Computationa | Finance suite. | |
| List (The f 1. 2. | of Exper Following Workin Financ | iments lab experiments could be pla og with financial market data: al data: statistical analysis and | nned on M data impor | ATLAB-(t, charting | Computationa | Finance suite. | |
| List of The f 1. | of Exper Following Workin Financ Time s | iments lab experiments could be pla ng with financial market data: al data: statistical analysis and eries analysis | nned on M data impor | ATLAB-(t, charting | Computationa | Finance suite. | 2 hours 4 hours |
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B. Tech Computer Science and Engineering and Business Systems

NON-CREDIT COURSES

(AY 2022 - 2023)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)

| Sl. No Course Code | | Course Title | Page No. | | |
|--------------------|---------|-------------------------------|----------|--|--|
| 1. | CHY1002 | Environmental Sciences | 174 | | |
| 2. | ENG1000 | Foundation English - I | 176 | | |
| 3. | ENG2000 | Foundation English - II | 179 | | |
| 4. | EXC4097 | Co-Extra Curricular Basket | | | |



VIT® Vellore Institute of Technology

CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

| Course Code | Course Title | L | Т | Р | J | С |
|------------------|--|------------------|---|---|---|---|
| CHY1002 | Environmental Sciences | 3 0 0 0 | | 3 | | |
| Pre-requisite | Chemistry of 12 th standard or equivalent | Syllabus version | | n | | |
| | | v. 1.1 | | | | |
| Course Objective | S: | | | | | |

- 1. To make students understand and appreciate the unity of life in all its forms, theimplications of life style on the environment.
- 2. To understand the various causes for environmental degradation.
- 3. To understand in dividuals contribution in the environmental pollution.
- 4. To understand the impact of pollution at the global level and also in the local environment.

Expected Course Outcome:

Students will be able to

- 1. Students will recognize the environmental issues in a problem oriented interdisciplinary perspective
- 2. Students will understand the key environmental issues, the science behind those problems and potential solutions.
- 3. Students will demonstrate the significance of biodiversity and its preservation
- 4. Students will identify various environmental hazards
- 5. Students will design various methods for the conservation of resources
- 6. Students will formulate action plans for sustainable alternatives that incorporate science, humanity, and social aspects
- 7. Students will have foundational knowledge enabling them to make sound life decisions as well as enter a career in an environmental profession or higher education.

Module:1 Environment and Ecosystem

7 hours

6 hours

Key environmental problems, their basic causes and sustainable solutions. IPAT equation. Ecosystem, earth – life support system and ecosystem components; Food chain, food web, Energy flow in ecosystem; Ecological succession- stages involved, Primary and secondary succession, Hydrarch, mesarch, xerarch; Nutrient, water, carbon, nitrogen, cycles; Effect of human activities on these cycles.

Module:2 Biodiversity

Importance, types, mega-biodiversity; Species interaction - Extinct, endemic, endangered and rare species; Hot-spots; GM crops- Advantages and disadvantages; Terrestrial biodiversity and Aquatic biodiversity – Significance, Threats due to natural and anthropogenic activities and Conservation methods.

| Module:3 |
|----------|
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B. Tech Computer Science and Engineering and Business Systems

Environmental hazards – causes and solutions. Biological hazards – AIDS, Malaria, Chemical hazards-BPA, PCB, Phthalates, Mercury, Nuclear hazards- Risk and evaluation of hazards. Water footprint; virtual water, blue revolution. Water quality management and its conservation. Solid and hazardous waste – types and waste management methods.

Module:4 Energy Resources

6 hours

6 hours

6 hours

5 hours

2 hours

Renewable - Non renewable energy resources- Advantages and disadvantages - oil, Natural gas, Coal, Nuclear energy. Energy efficiency and renewable energy. Solar energy, Hydroelectric power, Ocean thermal energy, Wind and geothermal energy. Energy from biomass, solar- Hydrogen revolution.

Module:5 Environmental Impact Assessment

Introduction to environmental impact analysis. EIA guidelines, Notification of Government of India (Environmental Protection Act – Air, water, forest and wild life). Impact assessment methodologies. Public awareness. Environmental priorities in India.

Module:6Human Population Change and Environment

Urban environmental problems; Consumerism and waste products; Promotion of economic development – Impact of population age structure – Women and child welfare, Women empowerment. Sustaining human societies: Economics, environment, policies and education.

Module:7 Global Climatic Change and Mitigation

Climate disruption, Green house effect, Ozone layer depletion and Acid rain. Kyoto protocol, Carbon credits, Carbon sequestration methods and Montreal Protocol. Role of Information technology in environment-Case Studies.

Module:8 Contemporary issues:

Guest lecture by Industry Experts or R&D organization

| | Total Lecture hours:45 hours | | | | | | | | |
|-----|---|--|------------|--|--|--|--|--|--|
| Tex | at Books | | | | | | | | |
| 1. | G. Tyler Miller and Scott E. Spool learning. | man (2016), Envir | onmental | Science, 15 th Edition, Cengage | | | | | |
| 2. | | | | | | | | | |
| | erence Books David M.Hassenzahl, Mary | | | R.Berg (2011). Visualizing | | | | | |
| 1. | Environmental Science, 4thEdition, | 0 | | | | | | | |
| | | | | | | | | | |
| Mo | de of evaluation: Internal Assessme | ent (CAT, Quizzes | s, Digital | Assignments) & FAT | | | | | |
| Rec | commended by Board of Studies | 12-08-2017 | | | | | | | |
| Арр | proved by Academic Council | cademic Council No. 46 Date 24-08-2017 | | | | | | | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| Course code | Course title | L | Т | P | J | С |
|---------------------|---|----------|----------|--------|--------|------|
| ENG1000 | Foundation English - I | | | 4 | 0 | 2 |
| Pre-requisite | Less than 50% EPT score | | Sylla | bus V | ersio | n |
| | | | | v. 1. | 0 | |
| Course Objec | ctives: | | | | | |
| | earners with English grammar and its application. | | | | | |
| | learners to comprehend simple text and train them to speak | and w | rite fla | awless | sly. | |
| 3. To familia | rize learners with MTI and ways to overcome them. | | | | | |
| Expected Co | arse Outcome: | | | | | |
| 1. Develop th | e skills to communicate clearly through effective grammar, | pronu | nciatio | on and | l writ | ing. |
| 2. Understand | everyday conversations in English | • | | | | C |
| 3. Communi | cate and respond to simple questions about oneself. | | | | | |
| 4. Improve v | ocabulary and expressions. | | | | | |
| 5. Prevent M | TI (Mother Tongue Influence) during usual conversation. | | | | | |
| Module:1 | Essentials of grammar | | | | 31 | Hour |
| Understand ba | sic grammar-Parts of Speech | | | | | |
| | nmar worksheets on parts of speech | | | | | |
| Module:2 | Vocabulary Building | | | | 31 | Hour |
| | velopment; One word substitution | | | | 01 | loui |
| • | entary vocabulary exercises | | | | | |
| Module:3 | Applied grammar and usage | | T | | 4] | Hour |
| Types of sente | nces; Tenses | | | | | |
| Activity: Gran | nmar worksheets on types of sentences; tenses | | | | | |
| Module:4 | Rectifying common errors in everyday conversation | <u> </u> | | | 4] | Hour |
| Detect and rec | tify common mistakes in everyday conversation | | | | | |
| Activity: Com | mon errors in prepositions, tenses, punctuation, spelling and | other | parts | of sp | eech; | |
| Colloquialism | | | | | | |
| Module :5 | Jumbled sentences | | | | 21 | Hour |
| Sentence struc | ture; Jumbled words to form sentences; Jumbled sentences t | o forr | n para | Igraph | / sho | ort |
| story | | | • | - 1 | | |
| • | ramble a paragraph / short story | | | | | |
| | Text-based Analysis | | | | 41 | Hour |
| Module:6 | i CAt-Dascu Anarysis | | | | | |
| | Autobiography of APJ Abdul Kalam (Excerpts) | | | | | |





| Module:7 | Correspondence | 3 Hours |
|----------------|--|------------------|
| Letter, Email | , Application Writing | |
| Activity: Cor | npose letters; Emails, Leave applications | |
| | | |
| Module:8 | Listening for Understanding | 4 Hours |
| Listening to a | simple conversations & gap fill exercises | |
| Activity: Sim | ple conversations in Received Pronunciation using audio-visual materials. | |
| | | |
| Module:9 | Speaking to Convey | 6 Hours |
| | tion; role-plays; Everyday conversations | |
| Activity: Id | entify and communicate characteristic attitudes, values, and talents; | Working and |
| interacting w | vithin groups | |
| | 1 | |
| Module:10 | Reading for developing pronunciation | 6 Hours |
| | with focus on pronunciation by watching relevant video materials | |
| • | ctice pronunciation by reading aloud simple texts; Detecting syllables; Visi | ually connecting |
| to the words | shown in relevant videos | |
| | | |
| Module:11 | Reading to Contemplate | 4 Hours |
| Reading shore | t stories and passages | |
| Activity: Rea | ding and analyzing the author's point of view; Identifying the central idea | |
| | | |
| Module:12 | Writing to Communicate | 6 Hours |
| • • | riting; Essay Writing; Short Story Writing | |
| | ting paragraphs, essays and short- stories | |
| Module:13 | Interpreting Graphical Data | 6 Hours |
| | raphical illustrations; interpreting basic charts, tables, and formats | |
| Activity: Inte | erpreting and presenting simple graphical representations/charts in the for | m of PPTs |
| | | |
| Module:14 | Overcoming Mother Tongue Influence (MTI) in Pronunciation | 5 Hours |
| | mmon variants in pronunciation | |
| Activity: Ide | ntifying and overcoming mother tongue influence. | _ |
| | Total Laboratory Hours | 60 Hours |
| Text Book / | Workbook | |
| 1. Wren, I | P.C., & Martin, H. (2018). High School English Grammar & Com | position N.D.V. |
| Prasada | Rao (Ed.). NewDelhi: S. Chand & Company Ltd. | |
| McCarth | y, M. O'Dell, F., & Bunting, J.D. (2010). Vocabulary in Use(High Inter | mediate students |
| | th answers). Cambridge University Press | |
| Reference E | | |
| Watkins | , P.(2018). Teaching and Developing Reading Skills: Cambridge Handboo | oks for Language |
| | Cambridge University Press. | Lunguage |
| .caeffelb | | |
| 2. Mishra, | S., & Muralikrishna, C. (2014). Communication Skills for Engineers. Pears | son Education |





| 3 | Lewi | is, N. (2011).Word Power Made Ea | sy. Goyal Pub | lisher | | | | | | |
|----|------------------------------------|---|----------------|------------|---------------|----------|--|--|--|--|
| 4 | https | s:/americanliterature.com/short-short-stories | | | | | | | | |
| 5 | Press | Tiwari, A., &Kalam, A. (1999).Wings of Fire - An Autobiography of Abdul Kalam. Universities Press (India) Private Limited. de of Evaluation: Quizzes, Presentation, Discussion, Role Play, Assignments | | | | | | | | |
| | | Challenging Experiments (Indica | | | | | | | | |
| | 1. Rearranging scrambled sentences | | | | | 8 hours | | | | |
| | 2. | 2. Identifying errors in oral and written communication | | | | 12 hours | | | | |
| | 3. | 3. Critically analyzing the text | | | | 8 hours | | | | |
| | 4. | Developing passages from hint | words | | | 8 hours | | | | |
| | 5. | Role-plays | | | | 12 hours | | | | |
| | 6. | Listening to a short story and an | nalyzing it | | | 12 hours | | | | |
| | | | Total I | Laborato | ry Hours | 60 hours | | | | |
| M | ode of | Evaluation: Quizzes, Presentat | ion, Discussio | on, Role | Play, Assignr | nents | | | | |
| Re | comm | ended by Board of Studies | 08-06-2019 | | | | | | | |
| Ap | prove | ed by Academic Council | Date | 13-06-2019 | | | | | | |



VIIT[®] Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

| ENG2000 Pre-requisite | Course title | L | Τ | Р | J | |
|--|--|--------|--------|--------|-------|------------|
| - | Foundation English - II | 0 | 0 | 4 | 0 | 2 |
| | 51% - 70% EPT Score / Foundation English I | | Sy | llabu | is v | version |
| | | | | V | v.1.0 |) |
| Course Objective | 5: | | | | | |
| 1. To practice gram | nmar and vocabulary effectively | | | | | |
| | iciency levels in LSRW skills in diverse social situations. | | | | | |
| 3. To analyze info | rmation and converse effectively in technical communication | on. | | | | |
| Expected Course | Outcome: | | | | | |
| 1. Accomplish a d | eliberate reading and writing process with proper grammar | and v | vocat | oulary | y. | |
| 2. Comprehend se | ntence structures while Listening and Reading. | | | - | | |
| - | ffectively and share ideas in formal and informal situations. | | | | | |
| | cialized articles and technical instructions and write clear te | | cal co | orres | pon | dence. |
| | and analyze with verbal ability. | | | 1 | L | |
| Module:1 | Grammatical Aspects | | | | | 4 hour |
| | Iodal Verbs, Concord (SVA), Conditionals, Connectives | | | | | indui |
| Activity : Workshe | | | | | | |
| | | | | | | |
| Module:2 | Vocabulary Enrichment | | | | | 4 hour |
| | • | | | | | |
| Activity : Workshe | ocabulary, Prefix and Suffix, High Frequency Words ets, Exercises | | | | | |
| Module:3 | Phonics in English | | | | | 4 Hour |
| Speech Sounds - ' | Vowels and Consonants – Minimal Pairs- Consonant Clus | sters- | Past | Ten | ise] | Marker and |
| Plural Marker | | | | | | |
| Activity : Workshe | ets, Exercises | | | | | |
| | | | T | | | |
| Module:4 | Syntactic and Semantic Errors | | | | | 2 Hour |
| | cles/ Prepositions/ Punctuation & Right Choice of Vocabu | lary | | | | |
| Activity : Workshe | ets, Exercises | | | | | |
| · | Stylistic errors | | | | | 2 Hour |
| Module:5 | <i>v</i> | | 1 | | | |
| | s, Parallelism, Standard English, Ambiguity, Redundancy, B | revity | y | | | |
| | s, Parallelism, Standard English, Ambiguity, Redundancy, B | revit | ý | | | |
| Dangling Modifier Activity : Workshe | s, Parallelism, Standard English, Ambiguity, Redundancy, B eets, Exercises | revity | ý | | | 6 Hour |
| Dangling Modifier Activity : Workshe Module:6 | s, Parallelism, Standard English, Ambiguity, Redundancy, B eets, Exercises Listening and Note making | | | in T | he | 6 Hour |
| Dangling Modifier Activity : Workshe Module:6 Intensive and Exter | s, Parallelism, Standard English, Ambiguity, Redundancy, B eets, Exercises Listening and Note making nsive Listening - Scenes from plays of Shakespeare (Eg: Co | ourt s | cene | | | Merchant d |
| Dangling Modifier Activity : Worksho Module:6 Intensive and Exter <i>Venice</i> , Disguise Sc | s, Parallelism, Standard English, Ambiguity, Redundancy, B eets, Exercises Listening and Note making | ourt s | cene | | | Merchant d |





| Module:7 | Art of Public Speaking | 6 Hours |
|---|--|---|
| Impromptu, Impo | ortance of Non-verbal Communication, Technical Talks, Dynamics of | Professional |
| Presentations – l | ndividual & Group | |
| Activity : Ice Bre | eaking; Extempore speech; Structured technical talk and Group present | ation |
| | | |
| Module:8 | Reading Comprehension Skills | 4 Hours |
| organization, rec supporting detai Reasoning Ques | nning, comprehensive reading, guessing words from context, ognizing argument and counter-argument; distinguishing between m l, fact and opinion, hypothesis versus evidence; summarizing and n tions – Reading and Discussion | ain information and note-taking, Critical |
| Activity: Reading | g of Newspapers Articles and Worksheets on Critical Reasoning from v | veb resources |
| Module: 9 | Creative Writing | 4 Hours |
| | ssay, Developing ideas on analytical/ abstract topics | |
| | Review, Essay Writing on suggested Topics, Picture Descriptions | |
| Module: 10 | Verbal Aptitude | 6 hours |
| | Sentence Completion using Appropriate words, Sentence Correction | 0 Hours |
| ••• | ng the use of appropriate words and sentences through web tools. | |
| Activity. I faction | ing the use of appropriate words and sentences through web tools. | |
| Module: 11 | Business Correspondence | 4 hours |
| Formal Letters- I | Format and purpose: Business Letters - Sales and complaint letter | |
| Activity: Letter v | vriting- request for Internship, Industrial Visit and Recommendation | |
| Module: 12 | Career Development | 6 hours |
| Telephone Etique | ette, Resume Preparation, Video Profile | |
| | ation of Video Profile | |
| Module: 13 | Art of Technical Writing - I | 4 hours |
| | tions, Process and Functional Description | 4 11001 5 |
| | Technical Instructions | |
| | | |
| Module: 14 | Art of Technical Writing – II | 4 hours |
| Format of a Rep | 1 | |
| Activity: Techni | cal Report Writing, Technical Proposal | |
| | Total Lecture hours: | 60 hours |
| Text Book / Wo | orkbook | |
| 1. Sanjay Ku | mar & Pushp Lata, Communication Skills, 2 nd Edition, OUP, 2015 | |
| | Aartin, High School English Grammar & Composition, Regular ed., N | D: Blackie ELT |
| Books, 20 | 10 | |



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| Refe | erence Books | | | | | | |
|--------------|---|---|--------------------------------|-------------|----------|--|--|
| 1 | Peter Watkins, Teaching and Developing Reading Skills: Cambridge Handbooks for Language | | | | | | |
| | Teachers, Cambridge, 2018 | | | | | | |
| 2 | Aruna Koneru, Professional Speaking Skills, OUP, 2015. | | | | | | |
| 3 | J.C.Nesfield, English Grammar Eng | J.C.Nesfield, English Grammar English Grammar Composition and Usage, Macmillan. 2019. | | | | | |
| 4 | Richard Johnson-Sheehan, Technical Communication Today, 6th edition, ND: Pearson, 2017. | | | | | | |
| 5 | Balasubramaniam, Textbook of English Phonetics For Indian Students, 3rd Edition, S. Chand | | | | | | |
| | Publishers, 2013. | | | | | | |
| Web | Resources | | | | | | |
| 1. <u>ht</u> | tps://www.hitbullseye.com/Sentence | -Correction-F | ractice.php | | | | |
| 2. <u>ht</u> | tps://hitbullseye.com/Critical-Reason | ing-Practice- | Questions.pl | <u>1p</u> | | | |
| Мо | de of Evaluation: Presentation, Discu | ssion Role P | lav Assignm | ents FAT | | | |
| | of Challenging Experiments (Indic | | <i>uy</i> , 1001 <u>9</u> 1111 | | | | |
| 1 | Reading and Analyzing Critical Re | asoning quest | ons | | 8 hours | | |
| 2 | 2. Listening and Interpretation of Vic | | | | 12 hours | | |
| 3 | 3. Letter to the Editor | | | | 6 hours | | |
| 4 | 4. Developing structured Technical T | alk | | | 12 hours | | |
| 5 | 5. Drafting SOP (Statement of Purpo | | | | 10 hours | | |
| 6 | 5. Video Profile | | | | 12 hours | | |
| | - | r | Fotal Labora | tory Hours | 60 hours | | |
| | | | | | | | |
| | le of Evaluation: Presentation, Disc | | Play, Assign | nments, FAT | | | |
| | ommended by Board of Studies | 08-06-2019 | | | | | |
| | proved by Academic Council | No. 55 | Date | 13-06-2019 | | | |