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| D:\Documents and Settings\admin\Desktop\MREC Logo.JPG | **MALLA REDDY ENGINEERING COLLEGE**  **(AUTONOMOUS)**  **(An UGC Autonomous Institution approved by AICTE and affiliated to JNTUH Hyderabad,**  **Accredited by NAAC with ‘A’ Grade (II-Cycle)**  **NBA Accredited Programmes – UG (CE, EEE, ME, ECE & CSE), PG (CE - SE, EEE – EPS, ME – TE)** | **EAMCET CODE: MREC** |

Department of Computer Science and Engineering

**(Cyber Security)**

**ApprovedCourse Structure and**

**Syllabus for I, II,III & IV Years**

**B.Tech. Computer Science and Engineering (Cyber Security) Programme.**

**(MR21 Regulations – Effective from Academic Year 2021-22 onwards)**

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| C:\Users\venkateshwar\Desktop\College Details\Logo\NAAC A Grade Logo.jpg  **Estd.: 2002** | Maisammaguda, Dhulapally (Post Via Kompally), Secunderabad-500100  Ph. No. 040-65864982, 09348161125, e-mail: [principal@mrec.ac.in](mailto:principal@mrec.ac.in), website:www.mrec.ac.in | C:\Users\venkateshwar\Desktop\College Details\Logo\NBA Logo.jpg  **JNTU Code:J4** |

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

**COMPUTER SCIENCE AND ENGINEERING**

**(Cyber Security)**

**Course Structure for B.Tech.Computer Science and Engineering**

**(Cyber Security)Programme.**

**(MR21 Regulations – Effective from Academic Year 2021-22 onwards)**

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| **MR21SEMESTER – I** | | | | | | | | |
| **S. No** | **Category** | **Course**  **Code** | **Name of the Subject** | **Contact**  **hours/week** | | | **Credits** |
| **L** | **T** | **P** |  |
|  | BSC | B0B01 | Linear Algebra and Numerical Methods | 3 | 1 | - | 4 |
| 1. 2 | BSC | B0B17 | Engineering Chemistry | 3 | 1 | - | 4 |
|  | ESC | B0501 | Programming for Problem Solving | 3 | - | - | 3 |
| 1. 3 | ESC | B0305 | Engineering Drawing | 1 | - | 4 | 3 |
| 1. 4 | BSC | B0B09 | Semiconductor Physics | 3 | 1 | - | 4 |
| 1. 5 | ESC | B0502 | Programming for Problem Solving Lab | - | - | 2 | 1 |
|  | BSC | B0B11 | Applied Physics Lab | - | - | 2 | 1 |
| 1. 6 | BSC | B0B18 | Engineering Chemistry Lab | - | - | 2 | 1 |
| **Total** | | | | **14** | **4** | **8** | **21** |
| **Total Contact Hours** | | | | **26** | | |

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| **MR21SEMESTER – II** | | | | | | | |
| **S. No** | **Category** | **Course Code** | **Name of the Subject** | **Contact**  **hours/week** | | | **Credits** |
| **L** | **T** | **P** |  |
|  | HSMC | B0H01 | English | 3 | - | - | 3 |
|  | ESC | B0201 | Basic Electrical and Electronics Engineering | 3 | - | - | 3 |
|  | BSC | B0B02 | Probability and Statistics | 3 | - | - | 3 |
|  | ESC | B0504 | Python Programming | 3 | 1 | - | 4 |
|  | ESC | B0506 | Python Programming Lab | - | 1 | 2 | 2 |
|  | HSMC | B0H02 | English Language and Communication Skills Lab | - | - | 2 | 1 |
|  | ESC | B0202 | Basic Electrical and Electronics Engineering Lab | - | - | 2 | 1 |
|  | ESC | B1201 | Engineering and IT Workshop | - | 1 | 2 | 2 |
| **Total** | | | | **12** | **2** | **8** | **19** |
| **Total Contact Hours** | | | | **22** | | |

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| **MR21 III SEMESTER** | | | | | | | |
| **S. No** | **Category** | **Course Code** | **Course Title** | **Contact**  **hours/week** | | | **Credits** |
| **L** | **T** | **P** |  |
| 1 | PCC | B0507 | [Discrete Mathematics](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S4_01_A0514_Discrete%20Mathematics.docx) | 3 | - | - | 3 |
| 2 | PCC | B0508 | [Computer Organization and Architecture](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_02_A0507_Computer%20Organization%20and%20Architecture.docx) | 3 | - | - | 3 |
| 3 | PCC | B0509 | Data Structures | 3 | - | - | 3 |
| 4 | PCC | B0510 | [Object Oriented Programming](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_04_A0509_Object%20Oriented%20Programming.docx) | 3 | - | - | 3 |
| 5 | PCC | B0511 | [Operating Systems](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_05_A0510_operating%20systems%20theory.docx) | 3 | - | - | 3 |
| 6 | PCC | B0512 | Data Structures Lab | - | - | 3 | 1.5 |
| 7 | PCC | B0513 | Object Oriented Programming Lab | - | - | 3 | 1.5 |
| 8 | PCC | B0514 | [Operating Systems Lab](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_08_A0513_operating%20systems%20lab.docx) | - | 1 | 2 | 2 |
| 9 | MC | B00M1 | [Gender Sensitization](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_10_A00M1_Gender%20Sensitization%20Lab.docx) | - | - | 2 | - |
| **Total** | | | | 17 | 1 | 10 | 20 |
| **Total Contact Hours:** | | | | **28** | | |  |

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| **MR21 IV SEMESTER** | | | | | | | | |
| **S. No** | **Category** | **Course Code** | **Course Title** | **Contact**  **hours/week** | | | | **Credits** |
| **L** | **T** | **P** | |
| 1 | BSC | B0B23 | Number Theory | 3 | - | - | 3 | |
| 2 | PCC | B6201 | Computer Networks | 3 | - | - | 3 | |
| 3 | PCC | B0515 | [Database Management Systems](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S4_02_A0515_DBMS_Theory.docx) | 3 | - | - | 3 | |
| 4 | PCC | B1202 | [Web](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S3_03_A0508_DAA.docx) Technology | 3 | - | - | 3 | |
| 5 | **Professional Elective –I** | | | | | | | |
| PEC-I | B0517 | Mobile Application Development | 3 | - | - | 3 | |
| B0518 | Free and Open-Source Technologies |
| B6601 | Fundamentals of Artificial Intelligence |
| 6 | PCC | B0520 | Database Management Systems Lab | - | 1 | 2 | 2 | |
| 7 | PCC | B1206 | Web Technologies Lab | **-** | **-** | 3 | 1.5 | |
| 8 | PCC | B6202 | Computer Networks Lab | - | - | 3 | 1.5 | |
| 9 | MC | B00M2 | [Environmental Science](file:///C:\Users\GOUTHAM\Desktop\MREC-CSE-BOS%20Meeting%20Files\S4_9_A00M2_Environmental%20Science.docx) | 3 | **-** | **-** | **-** | |
| **Total** | | | | 17 | 1 | 11 | | 20 |
| **Total Contact Hours:** | | | | **29** | | |  | |

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

**COMPUTER SCIENCE AND ENGINEERING**

**(Cyber Security)**

**Course Structure for B.Tech.Computer Science and Engineering**

**(Cyber Security)Programme.**

**(MR21 Regulations – Effective from Academic Year 2021-22 onwards)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **V SEMESTER** | | | | | | | | | | |
| **S.No** | **Category** | **Course**  **Code** | **Course Title** | **L** | | **T** | | **P** | | **Credits** |
| 1 | HSMC | B0H09 | Management Fundamentals | 3 | | - | | - | | 3 |
| 2 | PCC | B6203 | Cryptography and network Security | 3 | | - | | - | | 3 |
| 3 | PCC | **B6208** | Automata and Compiler Design | 3 | | - | | - | | 3 |
| 4 | PCC | B0525 | Software Engineering & Modeling | 3 | | - | | - | | 3 |
| 5 | **Professional Elective –II** | | | | | | | | | |
| PEC-II | B6204 | Network coding Theory | 3 | | - | | - | | 3 |
| B0526 | Advanced Databases Security |
| B6714 | Applied Artificial Intelligence |
| B0528 | Semantic Web |
| B0516 | **Design and Analysis of Algorithms** |
| 6 | **Professional Elective –III** | | | | | | | | | |
| PEC-III | B6917 | Internet of Things | 3 | | - | | - | | 3 |
| B0533 | **Distributed Systems** |
| B6205 | Essentials of Network Security |
| B6705 | Advanced Python Programming |
| B0534 | Animation Techniques |
| 7 | PCC | B6206 | Cryptography and network Security Lab | - | | - | | 3 | | 1.5 |
| 8 | PCC | **B6218** | Automata and Compiler Design Lab | - | | - | | 3 | | 1.5 |
| 9 | MC | B00M3 | Quantitative Aptitude & Verbal Reasoning – I | 2 | | - | | - | | - |
| **Total** | | | | **20** | **-** | | **6** | | **21** | |
| **Total Contact Hours :26** | | | | | | | | | | |

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| **VI SEMESTER** | | | | | | | |
| **S.No** | **Category** | **Course**  **Code** | **Course Title** | **L** | **T** | **P** | **Credits** |
| 1 | HSMC | B0H08 | Engineering Economics and Accountancy | 3 | - | - | 3 |
| 2 | PCC | B6209 | Ethical Hacking | 3 | - | - | 3 |
| 3 | PCC | B0536 | Data Mining | 3 | - | - | 3 |
| 4 | **Professional Elective -IV** | | | | | | |
| PEC-IV | B6210 | Internet Technologies and Services | 3 | - | - | 3 |
| B0523 | Mobile Computing |
| **B0527** | **Cloud Computing** |
| B1208 | Information Retrieval |
| B0554 | Software Quality Assurance and Testing |
|  | Professional Elective -V | | | | | | |
| 5 | PEC-V | B6211 | Advanced wireless networks | 3 | - | - | 3 |
| B0537 | Natural Language Processing |
| B0545 | Block chain Technologies |
| **B6220** | **Data Science for Engineers** |
| B6213 | IT Security Metrics |
| 6 | HSMC | B0H03 | English Communication and Presentation Skills Lab | - | - | 2 | 1 |
| 7 | PCC | B6214 | Ethical Hacking Lab | - | - | 2 | 1 |
| 8 | PCC | B0544 | Data Mining Lab | - | - | 3 | 2 |
| 9 | MC | B00M4 | Quantitative Aptitude and Verbal Reasoning - II | 2 | - | - | - |
| **Total** | | | | **20** | **-** | **8** | **19** |
| **Total Contact Hours :28** | | | | | | | |

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| **VII SEMESTER** | | | | | | | |
| **S. No** | **Category** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** |
| 1 | PCC | B6215 | Digital Forensics | 3 | - | - | 4 |
| 2 | PCC | B1210 | Machine Learning | 3 | - | - | 3 |
| 3 | PCC | B6217 | Cyber Security | 3 | - | - | 3 |
|  |  |  | **Professional Elective-VI** |  |  |  |  |
|  |  | **B6706** | R Programming |  |  |  |  |
|  |  | B0550 | Deep Learning |  |  |  |  |
| 4 | PEC-VI | B0551 | Social Networking | 3 | - | - | 3 |
|  |  | B0552 | **Human Computer Interaction** |  |  |  |  |
|  |  | B1211 | Soft computing |  |  |  |  |
| 5 | OEC-I |  | **Open Elective-I** |  |  |  |  |
|  |  | A1218 | **Software Project Management** | 3 | - | - | 3 |
| 6 | PCC | B6216 | Digital Forensics Lab | - | - | 2 | 2 |
| 7 | PCC | B1212 | Machine Learning Lab | - | - | 2 | 1 |
| 8 | MC | B00P1 | Mini Project / Internship |  | - | 4 | 2 |
| **Total** | | | | 15 |  | 8 | 21 |
| **Total Contact Hours :23** | | | | | | | |

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| **VIII- SEMESTER** | | | | | | | |
| **S.No** | **Category** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Credits** |
|  |
| 1 | OEC-II | B0H09 | Open Elective-II (Organizational Behavior) | 3 |  |  | 3 |
| 2 | OEC-III | B0159 | Open Elective-III (Green Building) | 3 | - | - | 3 |
| 3 | PRJ | B00P3 | Seminar | - | - | 2 | 1 |
| 4 | PRJ | B00P2 | Major Project | - | - | 24 | 12 |
| Total | | | | 6 | - | 26 | 19 |
| **Total Contact Hours :32** | | | | | | | |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. V Semester** | | |
| **Code: B0H09** | **MANAGEMENT FUNDAMENTALS** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

## Prerequisites: NIL

PREREQUISITES: NIL

Course Objectives:

Through reading the text, references and discussion of cases students should be able to understand the fundamentals underlying the management of an organization.

MODULE – I: Management and Principles of Management [09 Periods] Introduction to Management: Concepts of Management and organization-nature, importance and Functions of Management, Taylor’s Scientific Management Theory, Fayol’s Principles of Management.

Management Theories: Mayo’s Hawthorne Experiments, Maslow’s Theory of Human Needs, Douglas McGregor’s Theory X and Theory Y, Herzberg’s Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Corporate Social responsibility.

MODULE – II: Planning, Organization and types of Structures [10 Periods] Planning: Need for planning- -Steps in the process of planning-Advantages and limitation of planning. Types of planning - Vision, Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Management by Objectives (MBO).

Organization and types of Structures: Basic concepts related to Organization - Departmentation and Decentralization, Types of Organizations- Line organization, Line and staff organization, functional organization, committee organization, matrix organization, Virtual Organization, Cellular Organization, boundary less organization, inverted pyramid structure, lean and flat Organization structure.

MODULE – III: STAFFING AND CONTROLLING [10 PERIODS]

Staffing: Basic concepts of HRM, functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development. Performance Appraisal, Job Evaluation and Merit Rating.

Controlling: process of controlling, types of controlling, managing productivity, Quality Control: chart, R chart, C chart, P chart, (simple Problems), Deming’s contribution to quality.

MODULE – IV: Operations and Materials Management [09 Periods] Operations Management : Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement.

Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.

MODULE – V: Project Management and Contemporary Practices [10 Periods] Project Management (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems)

Contemporary Management Practices: Basic concepts of ERP, Just-In-Time (JIT) System, Total Quality Management (TQM), six sigma and Capability Maturity Model (CMM) Levels, Bench marking, Balanced Score card.

## TEXT BOOKS:

1. Aryasri, **Management Science**, 4thedition TMH, 2004. (UNITSI,II,III,IV,V)
2. Stoner, Freeman, Gilbert, **Management,** Pearson Education, New Delhi, 6th Ed, 2004. (UNITSI,II)

## REFERENCES*:*

1. Kotler Philip & Keller Kevin Lane, **“Marketing Management”**, PHI, 12thedition, 2005
2. Koontz&Weihrich,**“EssentialsofManagement”**,TMH,6thedition,2005.
3. Thomas N.Duening &John M. Ivancevich **“Management - Principles and Guidelines”**, Biztantra, 5thedition2003.
4. Memoria&S.V.Gauker,**“PersonnelManagement”**,Himalaya,25thedition,2005
5. SamuelC.Certo,**“ModernManagement”**,PHI,9thedition,2005.

## E RESOURCES:

1. <http://freevideolectures.com/Course/2689/Management-Science>
2. [http://www.onlinevideolecture.com/?course=mba-programs&subject=human- resource-management](http://www.onlinevideolecture.com/?course=mba-programs&subject=human-resource-management)
3. [http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamenta](http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamental)l
4. [http://freevideolectures.com/Course/2371/Project-and-Production-Managemen](http://freevideolectures.com/Course/2371/Project-and-Production-Management)t
5. <http://nptel.ac.in/courses/110105034/>

## Course Outcomes:

At the end of the course, students will be able to

1. Understandthevariousconcepts,principlesandtheoriesofmanagement.
2. Understandthebasicconceptsofplanningandvariousstructuresoforganizations.
3. Understandtheprocessofstaffingandcontrolling
4. Understand the process of operations management. Also learn the concepts of materialsmanagementandmarketingmanagementatanorganization.
5. Understand the various contemporary management practices. Also the project managementtechniques

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | |
| **COS** | **Programme Outcomes(POs)** | | | | | | | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  |  |  |  |  | 2 | 3 | 1 |  |
| **CO2** |  | 3 |  |  |  |  |  |  | 2 |  | 1 |  |
| **CO3** |  | 3 |  |  |  |  |  |  |  | 2 | 1 |  |
| **CO4** |  | 3 |  | 2 | 1 |  |  |  |  |  |  |  |
| **CO5** |  |  |  | 2 |  |  | 3 |  |  |  | 1 |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B6201** | **CRYPTOGRAPHY AND NETWORK SECURITY** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Course Objectives:**

• Explain the objectives of information security

• Explain the importance and application of each of confidentiality, integrity, authentication and

availability

• Understand various cryptographic algorithms.

• Understand the basic categories of threats to computers and networks

• Describe public-key cryptosystem.

• Describe the enhancements made to IPv4 by IPSec.

• Understand Intrusions and intrusion detection

• Discuss the fundamental ideas of public-key cryptography

• Generate and distribute a PGP key pair and use the PGP package to send an encrypted email message.

• Discuss Web security and Firewalls

**MODULE - I**

**Security Concepts:** Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

**Cryptography Concepts and Techniques:** Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

**MODULE - II**

**Symmetric key Ciphers:** Block Cipher principles, DES, AES, Blowfish, RC5, IDEA, Block cipher operation, Stream ciphers, RC4.

**Asymmetric key Ciphers:** Principles of public key cryptosystems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm.

**MODULE - III**

**Cryptographic Hash Functions:** Message Authentication, Secure Hash Algorithm (SHA-512),

**Message authentication codes:** Authentication requirements, HMAC, CMAC, Digital signatures, Elgamal Digital Signature Scheme.

**Key Management and Distribution:** Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure.

**MODULE - IV**

**Transport-level Security:** Web security considerations, Secure Socket Layer and Transport Layer Security, HTTPS, Secure Shell (SSH)

**Wireless Network Security:** Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security

**MODULE - V**

**E-Mail Security:** Pretty Good Privacy, S/MIME IP Security: IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, Internet Key Exchange

**Case Studies on Cryptography and security:** Secure Multiparty Calculation, Virtual Elections, Single sign On, Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability

**TEXT BOOKS:**

1. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education,

6th Edition

2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition

**REFERENCE BOOKS:**

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.

2. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition

3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.

4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH

5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning

6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

**Course Outcomes:**

• Student will be able to understand basic cryptographic algorithms, message and web authentication and

Security issues

• Ability to identify information system requirements for both of them such as client and server

• Ability to understand the current legal issues towards information security

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | |
| **COS** | **Programme Outcomes(POs)** | | | | | | | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  |  |  |  |  | 2 | 3 | 1 |  |
| **CO2** |  | 3 |  |  |  |  |  |  | 2 |  | 1 |  |
| **CO3** |  | 3 |  |  |  |  |  |  |  | 2 | 1 |  |
| **CO4** |  | 3 |  | 2 | 1 |  |  |  |  |  |  |  |
| **CO5** |  |  |  | 2 |  |  | 3 |  |  |  | 1 |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B6202** | **AUTOMATA AND COMPILER DESIGN** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Course Objectives:**

* Automata and compiler Design mainly deals with the languages which are formal and regular and also deals with grammar present in the machine.
* An compiler is a program that accepts a program in source language and converts into a machine understandable format.
* The push down automata is the major one it's a five tuple set containing states, alphabets, transition function and accept states.

**MODULE-I   
Formal Language and Regular Expressions:** Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools

**Context Free grammars and parsing:** Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

**MODULE - II:**

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification

**Semantics:** Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

**MODULE-III**  
Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

**MODULE - III**

**Context Sensitive features –** Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations

**MODULE - IV**

**Run time storage:** Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

**Code optimization:** Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

**MODULE - V:**

**Code generation:** Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block

**TEXTBOOKS:**

1. Introduction to Theory of computation. Sipser, 2nd Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

**REFERENCES:**

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University  Press.
2. Compiler Construction, LOUDEN, Thomson.
3. Elements of Compiler Design, A. Meduna, Auerbach Publications, Taylor and Francis Group.
4. Principles of Compiler Design, V. Raghavan, TMH.

**Outcomes:**

* Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
* Attainsthe knowledge of language classes & grammars relationship among them with the help of chomsky hierarchy.
* Ability to understand the design of a compiler given features of the languages.
* Ability to implement practical aspects of automata theory.
* Gain knowledge of powerful compiler generation tools.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 3 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO3** | 2 | 3 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |
| **CO5** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |

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| **2021-2022**  **Onwards**  **(MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. V Semester** | | |
| **Code: B0526** | **SOFTWARE ENGINEERING AND MODELING**  (Common for CSE and IT) | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

##### Prerequisites:NIL

**CourseObjectives:**

ThiscourseenablesstudentstolearnfundamentalaspectsofSoftwareEngineering,analyzevarious process models, identify various types of requirements and the process for Requirements Engineering, make use of various System Models to conceptualize and construct a system, demonstrate different testing tactics and define metrics for software measurement, classify and mitigate the Software Risks, learn to achieve quality standards, understand the Unified Modeling Language Principles and learns fundamental process pattern for object-oriented analysis and design.

**MODULE I: Introduction toSoftwareEngineering [09 Periods] Basic terms of Software Engineering-** The evolving role of software, Changing Nature of Software, Software Myths, Software engineering-A layered technology, A Process Framework, The Capability Maturity Model Integration(CMMI).

**Process Models-** The water fall model, Incremental process models, evolutionary process models, unified process.

**MODULE II: Requirements of Software Engineering [09 Periods] Software Requirements-**Functional and non-functional requirements, User requirements, System requirements, Interface specification, software requirements document.

**Requirements Engineering Process -** Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management

**MODULE III: Phases of Software Engineering [10 Periods] A: System Models -**Context models, Behavioral models, Data models, Object models, structured methods.

**B: Design Engineering and creating an Architectural Design-** Design process and Design quality, Design concepts, the design model, Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**MODULE IV: Testing Methodology [09 Periods] Testing Strategies-** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box Testing, Validation Testing, System Testing.

**Risk Management** - Reactive vs proactive risk strategies, RMMM and plan. Quality concepts, Software quality assurance, Software reviews, Statistical Software Quality Assurance, Software Reliability, ISO 9000 Quality standards

**MODULE V: Introduction to UML and Modeling [11 Periods] Introduction and Architecture-** Introduction to UML, Importance of modeling, principles of modeling, object oriented modeling. Conceptual model of the UML, Architecture, Use cases

**Basic Behavioral and Structural-** Use case Diagrams, Activity Diagrams, Classes, Relationships, common Mechanisms and diagrams. Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Terms, concepts, modeling techniques for Class and Object Diagrams, Interactions, Interaction diagrams.

**TEXTBOOKS:**

1. RogerS. Pressman, **“Software engineering-A practitioner’s Approach”**, McGraw-Hill International Edition, 6thedition.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, ―**The Unified Modeling Language User Guide**‖, Pearson Education.

##### **REFERENCES:**

1. Pankaj Jalote, **“An Integrated Approach to Software Engineering”**, Springer Verlag, 1997.
2. Meilir Page-Jones, ―**Fundamentals of Object Oriented Design in UML**‖, Pearson Education.

##### **E –RESOURCES:**

1. <http://freequestionpaper.in/questionpaper/2014/08/Software-Engineering-Roger-S-Pressman-5th-edition-IDM.pdf>
2. [https://books.google.co.in/books?id=PqsWaBkFh1wCandprintsec=frontcoveranddq=software+ engineering+by+ian+sommerville+FREE+downloadandhl=enandsa=Xandved=0ahUKEwjjv5fhpb\_TAhUHOo8KHY5OAC4Q6AEIKjAB#v=onepageandq=software%20engineering%20by](https://books.google.co.in/books?id=PqsWaBkFh1wC&amp%3Bprintsec=frontcover&amp%3Bdq=software%2Bengineering%2Bby%2Bian%2Bsommerville%2BFREE%2Bdownload&amp%3Bhl=en&amp%3Bsa=X&amp%3Bved=0ahUKEwjjv5fhpb_TAhUHOo8KHY5OAC4Q6AEIKjAB%23v%3Donepage&amp%3Bq=software%20engineering%20by%20ian%20sommerville%20FREE%20download&amp%3Bf=false)

[%20ian%20sommerville%20FREE%20downloadandf=false](https://books.google.co.in/books?id=PqsWaBkFh1wC&amp%3Bprintsec=frontcover&amp%3Bdq=software%2Bengineering%2Bby%2Bian%2Bsommerville%2BFREE%2Bdownload&amp%3Bhl=en&amp%3Bsa=X&amp%3Bved=0ahUKEwjjv5fhpb_TAhUHOo8KHY5OAC4Q6AEIKjAB%23v%3Donepage&amp%3Bq=software%20engineering%20by%20ian%20sommerville%20FREE%20download&amp%3Bf=false)

1. <http://ieeexplore.ieee.org/document/4807670/>
2. [https://link.springer.com/search?facet-journal-id=40411andpackage=openaccessarticlesandquery=andfacet-sub-discipline=%22Software+Engineering%22](https://link.springer.com/search?facet-journal-id=40411&amp%3Bpackage=openaccessarticles&amp%3Bquery&amp%3Bfacet-sub-discipline=%22Software%2BEngineering%22)
3. <http://freevideolectures.com/Course/2318/Software-Engineering>

##### **Course Outcomes:**

At the end of the course, students will be able to

1. **Analyze** the customer business requirements and choose the appropriate Process model for the given project
2. **Elicit** functional and non-functional requirements using rigorous engineering methodology
3. **Conceptualize**andachieverequirementsdefinedforthesystemusingArchitecturalstylesand Design patterns
4. **Design** Test cases and define metrics for standardization, mitigate and monitor the risks and assure quality standards.
5. **Understand** the basic concepts of UML and Implement the real time application using UML concepts

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 3 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO3** | 2 | 3 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |
| **CO5** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |

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| **2021-2022**  **Onwards**  **(MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. V Semester** | | |
| **Code: B6203** | **NETWORK CODING THEORY** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Course Objectives:**

1. Learn the fundamentals of network coding theory.
2. Understand the performance parameters required for network coding.
3. Gain the knowledge of the network coding design methods.
4. Learn different approaches for the network coding.
5. Understand error correction and detection methods of adversarial errors.

# Course Outcomes:

1. Demonstrate knowledge and understanding of the fundamentals of Network Coding Theory.
2. Summarize all the performance parameters and resources for network coding.
3. Construct the network code for different networks.
4. Deal with different approaches of Network Coding in lossy and lossless networks.
5. Deal with multiple sources network coding and detect adversarial errors.

# MODULE- I

**Introduction:** A historical Perspective, Network Coding; Network Coding Benefits: Throughput, Robustness, Complexity, Security; Network Model.

**Main Theorem of Network Multicast:** The Min-Cut Max-flow Theorem, The Main network coding Theorem,

**Theoretical Framework for Network Coding:** A Network Multicast Model, algebraic Framework, Combinatorial Framework, Information-Theoretic Framework, Types of Routing and coding**.**

**MODULE – II**

**Throughput Benefits of Network Coding:** Throughput Measures, Linear Programming Approach, Configurations with Large Network Coding Benefits, Configurations with Small Network Coding Benefits, Undirected Graphs.

**Networks with Delay and Cycles:** Dealing with Delay, Optimizing for Delay, Dealing with Cycles. **Resources for Network Coding:** Bounds on Code Alphabet Size, Bounds on the Number of Coding Points, Coding with Limited Resources.

**MODULE - III**

**Network Code Design Methods For Multicasting:** Common initial procedure, centralized algorithms, decentralized algorithms, scalability to network changes. Single-Source Linear Network Coding:

**Acyclic Networks:** Acyclic Networks, Linear network code, Desirable properties of a linear network code, Existence and construction, Algorithm refinement for multicast.

**Cyclic Networks:** Delay-Free Cyclic Code, Non-equivalence between local and global descriptions, Convolutional network code, decoding of convolutional network code.

# MODULE - IV

**Inter-Session Network Coding:** Scalar and vector linear network coding, Fractional coding problem formulation, Insufficiency of linear network coding, Information theoretic approaches: Multiple uni cast networks; Constructive approaches: Pair wise XOR coding in wire line networks, XOR coding in wireless networks.

**Network Coding in Lossy Networks:** Random linear network coding, Coding theorems: Uni cast connections, Multicast connections, Error exponents for Poisson traffic with i.i.d. losses.

**Sub graph Selection:** Flow-based approaches: Intra-session coding, Computation-constrained coding, Inter-session coding; Queue-Length-Based approaches: Intra-session network coding for multicast sessions, Inter-session coding.

**MODULE - V**

**Multiple Sources Network Coding:**

**Superposition coding and max-flow bound; Network Codes for Acyclic Networks:** Achievable information rate region, Inner bound Rin, Outer bound Rout, RLP – An explicit outer bound.

**Security against adversarial Errors:** Error correction: Error Correcting bounds for centralized network coding, Distributed random network coding and polynomial-complexity error correction; Detection of adversarial errors: Model and problem formulation, Detection probability.

# Text Books:

1. Raymond W. Yeung, Shuo-Yen Robert Li, Ning Cai, Zhen Zhang, “Network Coding Theory”, now publishers Inc, 2006, ISBN:1-933019-24-7.
2. Christina Fragouli, Emina Soljanin, “Network Coding Fundamentals”, now publishers Inc, 2007, ISBN: 978-1-60198-032-8.

**Reference Books:**

1. Tracey Ho, Desmond Lun, “Network Coding: An Introduction”, Cambridge University Press, 2008, ISBN: 978-0-521-87310-9.
2. Muriel Medard, Alex Sprintson, “Network Coding: Fundamentals and Applications”, 1st Edition, 2012, Academic Press, Elsevier, ISBN:978-0-12-380918-6.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 3 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO3** | 2 | 3 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |
| **CO5** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |

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| **2021-2022**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **IV Semester** | | |
| **Code: B0525** | **ADVANCED DATABASES** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

Prerequisites: Database Concepts

**Course Objectives:** To understand the distributed database management and real-time application management.

**Module I: Introduction of DBMS:** [10 Periods]

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas

**Overview of Relational DBMS**

Relational Database Concepts, Normalization, Integrity rules, Relational data languages

**Module II: Distributed DBMS Architecture:** [09 Periods]

Architectural Models for Distributed DBMS, DDBMS Architecture.

Distributed Database Design: Alternative Design Strategies, Distributed Database, Design issues, Fragmentation, Allocation.

**Module III: Query Processing and Decomposition** [09 Periods]

A: Query Processing objectives, Characterization of query processors.

B: Layers of query processing, query decomposition, Localization of distributed data.

**Module IV: Query Optimization:** [09 Periods]

Query optimization, centralized query optimization, Distributed query optimization algorithms.

**Module V: Transaction Management and Concurrency Control** [11 Periods]

**Transaction Management:** Definition, properties of transaction, types of transactions. Distributed **Concurrency Control:** Serializability, concurrency control Mechanisms & Algorithms, Time stamped & Optimistic concurrency control Algorithms, Deadlock Management

**TEXTBOOKS:**

1. M.Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.

2. Stefano Ceri and Willipse Pelagatti: Distributed Databases, McGraw Hill.

**REFERENCES:**

1. Henry F Korth, A Silberchatz and Sudershan: Database System Concepts, MGH.

2. Raghuramakrishnan and Johhanes Gehrke: Database Management Systems, MGH.

**Course Outcomes:**

1. Understand the role of a distributed database management system in an Enterprise/organization.

2. Design queries of a distributed database management system

3. Apply the principles of query optimization techniques to a database schema.

4. Understand the concept of a database transaction including concurrency control, backup and recovery and data object locking and protocols.

1. Explain the various types of locking mechanisms used in within database management systems.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| **CO1** | 3 | 2 | 2 |  |  | 3 |  |  |  | 2 |  | 3 | 3 | 3 |  |
| **CO2** | 3 | 3 | 3 |  |  | 3 |  |  |  | 3 |  | 3 | 3 | 3 |  |
| **CO3** | 3 | 3 | 3 |  |  | 2 |  |  |  | 3 |  | 2 | 3 | 3 |  |
| **CO4** | 3 | 2 | 1 |  |  | 1 |  |  |  | 1 |  | 1 |  |  |  |
| **CO5** | 3 | 1 | 1 |  |  | 1 |  |  |  |  |  | 1 |  |  |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **IV Semester** | | |
| **Code: B0526** | **ARTIFICIAL INTELLIGENCE** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Discrete Mathematics

**Course Objectives:** This course enable the students to understand the basic fundamentals of Artificial Intelligence, determine various problem solving strategies, understand the logic concepts, different approaches to represent the knowledge, develop the expert systems in various phases and its applications, apply the fuzzy logic in various problem solving techniques

**MODULEI:Introduction**  [10 Periods]

Introduction to Artificial Intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of AI languages, current trends in AI.

**MODULE II: Problem Solving**  [09 Periods]

Problem solving: state-space search and control strategies: Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterative deepening a\*, constraint satisfaction. Problem reduction and game playing: Introduction, problem reduction, game playing, alphabeta pruning, two-player perfect information games.

**MODULE III: Logic Concepts and Knowledge Representation** [10 Periods]

**A: Logic Concepts** - Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic.

**B: Knowledge Representation** - Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, cyc theory, case grammars, semantic web

**MODULE IV: Expert System and Applications** [10 Periods]

Introduction phases in building expert systems, expert system versus traditional systems, rule-based expert systems, blackboard systems truth maintenance systems, application of expert systems, list of shells and tools.

**MODULE V: Uncertainty Measure**  [09 Periods]

Probability theory: Introduction, Bayesian belief networks, certainty factor theory, dempster-shafer theory. Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems.

**TEXT BOOKS:**

1. Saroj Kaushik, “Artificial Intelligence”, CENGAGE Learning,

2. Stuart Russel, Peter Norvig, “Artificial intelligence, A modern Approach”, 2nd ed, PEA

3. Rich, Kevin Knight, Shiv Shankar B Nair, “Artificial Intelligence”, 3rd Ed, TMH

4. Patterson,”Introduction to Artificial Intelligence”, PHI

**REFERENCES:**

1. George F Lugar, “Atificial intelligence, structures and Strategies for Complex problem solving”, 5th edition, PEA

2. Ertel, Wolf Gang, “Introduction to Artificial Intelligence”, Springer 3. Blay WhitBY “Artificial Intelligence” Rosen Publishing.

**E-RESOURCES:**

1. <https://i4iam.files.wordpress.com/2013/08/artificial-intelligence-by-rich-andknight.pdf>

2.https://books.google.co.in/books?id=pVR9W5LEZUwC&printsec=frontcover&source=gbs\_ge\_summary\_r&cad=0#v=onepage&q&f=false

3. <https://www.journals.elsevier.com/artificial-intelligence/>

4. <http://www.ceser.in/ceserp/index.php/ijai>

5.http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7\_M07uyea\_7zp\_zR G3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA

6.http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVlXBW-YWRBg\_vrHK12lgOzTVbb5oZ6eQOBjCWDfRvquHJLEOFENjI5AmOqRc9Ar3eJF4CGFrw

**Course Outcomes:**

At the end of the course, students will be able to

1. Describe the key components of the Artificial Intelligence field.

2. Identify various problem solving strategies.

3. Construct the solution for the problem using various logic and knowledge representation techniques.

4. Interpret the knowledge in various domains using expert systems.

5. Discover the solutions by using

the probability theory and fuzzy logic.

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| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | |
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| **CO2** | - | 2 | 2 |  |  |  |  |  |  |  |  |  |
| **CO3** | 2 | 2 | 2 | 3 |  |  |  |  |  |  |  |  |
| **CO4** | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  |  |
| **CO5** | 1 | 2 |  |  |  |  |  |  |  |  |  |  |

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| **2021-22**  **Onwards (MR-210)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B0527** | **SEMANTIC WEB** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Web Technologies

## Course Objectives:

This course enables the students to learn and understand the fundamental technologies for enabling the envisioned semantic web, study various knowledge representation techniques, make use of development tools and methods for ontology engineering, construct application and services using semantic web technologies and analyze various collaboration networks.

**MODULE I: World Wide Web [09 Periods]**

**Web Intelligence –** Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today’s Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence

**Web Description-** Ontology, Inference Engines, Software Agents, Berners-Leewww, Semantic Road Map, Logic on the semantic Web.

**MODULE II: Knowledge Representation for the Semantic Web [10 Periods]**

**Ontology -** Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web-Resource Description Frame work (RDF)/RDF Schema,

**Web Languages -** Ontology Web Language (OWL), UML, XML, XML Schema.

**MODULE III: Ontology Engineering [10 Periods]**

**A: Ontology Development-**Ontology Engineering, constructing Ontology, Ontology,

Development Tools, Ontology Methods

**B: Ontology Sharing and Merging -** Ontology Sharing and Merging, Ontology, Libraries and Ontology mapping, Logic, Rule and Inference Engines.

**MODULE IV: Semantic Web Applications, Services and Technology [10 Periods]**

**Semantic Web Services -** Semantic Web applications and services, Semantic Search, e-learning

**Semantic Web Applications -** Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods

**MODULEV: Social Network Analysis and Semantic Web [09 Periods]**

**Social Network Analysis-**What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks.

**Semantic Web -** Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

## TEXT BOOKS:

1. Berners Lee, Gödel and Turing,“**Thinkingontheweb**”,Wileyinterscience,2008.
2. PeterMika,“.**SocialNetworksandtheSemanticWeb**”,Springer,2007.

## REFERENCES:

1. J.Davies, R.Studer, P.Warren, Johri. Wiley & Sons, “Semantic Web Technologies,

Trends and Research in Ontology Based Systems”

1. Liyang Lu Chapman and Hall, **“ Semantic Web and Semantic Web Services**”, CRC Publishers,(Taylor & FrancisGroup)

## E-RESOURCES:

1. [http://as.wiley.com/WileyCDA/WileyTitle/productCd-0471768669.htm](http://as.wiley.com/WileyCDA/WileyTitle/productCd-0471768669.html)l
2. <http://www.springer.com/in/book/9780387710006>
3. <https://research.vu.nl/ws/portalfiles/portal/2312133>
4. <http://nptel.ac.in/courses/106105077/18>

## Course Outcomes:

At the end of the course, students will be able to

1. **Develop** web applications using semantic techniques.
2. **Relate** knowledge representation methods for semantic web.
3. **Explain** the key aspects of ontology engineering**.**
4. **Design** web services and its applications.
5. **Analyze** and build a social network.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COS** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** |  |  | 2 |  | 2 |  |  |  | 3 |  |  |  |  | 2 |  |
| **CO2** | 2 | 3 |  | 1 |  |  |  |  |  |  |  |  | 2 |  |  |
| **CO3** |  |  | 2 | 3 | 3 |  |  |  |  |  |  |  | 2 | 1 |  |
| **CO4** |  |  | 2 | 2 | 2 |  |  |  | 3 |  |  |  |  | 2 |  |
| **CO5** | 2 | 3 |  |  | 1 |  |  |  |  |  |  |  | 2 |  |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **IV Semester** | | |
| **Code: B0516** | **Design and Analysis of Algorithms**  **(Common for CSE, CSE (Cyber Security), CSE (AI and ML), CSE (DS), CSE (IOT) and IT)** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Data Structures

**Course Objectives:**

* To learn fundamental concepts an algorithm, Pseudo code, performance analysis, time complexity,

Dis joint sets, spanning trees and connected components.

* To Learn and Understanding of divide and conquer, applications, binary search, sorting and Strassen‘s matrix, greedy method, job sequencing, spanning trees and shortest path problem.
* To Learn and understanding dynamic programming, matrix chain, optimal binary search, knapsack problem and optimization methods, all pairs shortest path, travelling sales problem and reliability design.
* To Learn and understanding backtracking, n-queen problems, subset problem, graph coloring, Hamiltonian cycles and branch bound methods, travelling sales, knapsack problem, branch and bound, FIFO branch.
* To Learn and understanding of NP Hard and NP complete problems

**MODULE I:Basics of Algorithm Design [09 Periods]** Introduction -Algorithm, Pseudo code for expressing algorithms, Performance AnalysisSpace complexity, Time complexity, Asymptotic Notations, Amortized analysis. Disjoint Sets -Disjoint set operations, union and find algorithms, spanning trees, connected components and bi connected components.

**MODULE II:Algorithm Methods [10 Periods]** Divide and Conquer - General method, applications-Binary search, Quick sort, Merge sort, Strassen‘s matrix multiplication Greedy method General method, applications-Job sequencing with deadlines, general knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**MODULE III:Dynamic Programming and Optimization Techniques [10 Periods]** A: Dynamic Programming - General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem . B: Optimization Techniques - All pairs shortest path problem, travelling sales person problem, Reliability design.

**MODULE IV:Backtracking and Branch and Bound [10 Periods]** Backtracking-General method, n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles Branch and Bound - General method, applications: Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. 92

**MODULE V:NP-Hard and NP-Complete problems [09 Periods]** NP-Hard and NP-Completeness: Basic concepts, NP - Hard and NP Complete classes, Cook‘s theorem, Deterministic and Non-Deterministic algorithms, NP-hard graph problems and scheduling problem

**TEXTBOOKS:**

1. Ellis Horowitz, SatrajSahni and Rajasekharan, "Fundamentals of Computer Algorithms"Galgotia publications pvt. Ltd 2. T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, "Introduction to Algorithms", second edition, PHI Pvt. Ltd./ Pearson Education

**REFERENCES:**

1. M.T.Goodrich and R.Tomassia "Algorithm Design, Foundations, Analysis and Internet examples", John wiley and sons.

2. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, "Introduction to Design and Analysis of Algorithms A strategic approach", Mc Graw Hill. 3. Parag Himanshu Dave, Himanshu BalchandraDave,"Design and Analysis of algorithms" Pearson

**E-RESOURCES:**

1.https://comsciers.files.wordpress.com/2015/12/horowitz-and-sahani-fundamentals-ofcomputer-algorithms-2nd-edition.pdf

2.https://books.google.co.in/books?id=7qKXCzF1XC8C&printsec=frontcover&dq=T.H.Co rmen,C.E.Leiserson,+R.L.Rivest,and+C.Stein,+%22Introduction+to+Algorithms%22,+se cond+edition,+PHI+Pvt.+Ltd./+Pearson+Education,ebook,pdf&hl=en&sa=X&ved=0ahU KEwjFupORxdXTAhXLQo8KHU7FC5cQ6AEIKjAB#v=onepage&q&f=false

3. <http://en.cnki.com.cn/Article_en/CJFDTOTAL-JFYZ200208019.htm>

4. <http://nptel.ac.in/courses/106101060/>

**Course Outcomes:** At the end of the course, students will be able to

1. Analyze performance of algorithms using asymptotic notations, performance analysis, disjoint sets, spanning trees and connected components

2. Describe and analyze paradigms for designing good algorithms using Divide-andConquer and Greedy Techniques, applications, binary search, sorting and Strassen‘s matrix, greedy method, job sequencing, spanning trees and shortest path problem.

4. Synthesize dynamic-programming algorithms and analyze matrix chain, optimal binary search, knapsack problem and optimization methods, all pairs shortest path, travelling sales problem and reliability design.

5. Apply backtracking and branch and bound techniques to solve some complex problems, n-queen problems, subset problem, graph coloring, Hamiltonian cycles and branch bound methods, travelling sales, knapsack problem, branch and bound, FIFO branch

6. Apply algorithm design techniques to solve certain NP-complete problems.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | | |
| COs | **Programme Outcomes (POs)** | | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 | 3 | 2 |  |  |  |  |  |  |  |  | 3 | | 2 |  |
| **CO2** | 3 | 2 | 3 | 2 |  |  |  |  |  |  |  |  | 3 | | 2 |  |
| **CO3** | 3 | 2 | 3 | 2 |  |  |  |  |  |  |  |  | 3 | | 2 |  |
| **CO4** | 3 | 2 | 3 | 2 |  |  |  |  |  |  |  |  | 3 | | 2 |  |
| **CO5** | 3 | 2 | 3 | 2 |  |  |  |  |  |  |  |  | 3 | | 2 |  |

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| **2021-2022**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VI Semester** | | |
| **Code: B0532** | **INTERNET OF THINGS**  **[Professional Elective – IV]** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Basic knowledge of computer architecture, programming and communication protocols

## Course Objectives:

Understand the basics of Embedded System, IoT and the development model. Understand the architecture, Instruction set and work on ARM microcontroller using practical hands-on. Ability to select appropriate hardware and microcontrollers based on need of application. Understand the Internet of Things Standards, Frameworks and Techniques. Apply the tools, techniques and skills acquired towards development of Projects.

## MODULE I - Introduction to Embedded Systems and Internet of Things (IOT)

**[09 Periods]**

Architecture of Embedded Systems, Embedded Systems Development process, Architecture of Internet of Things, Applications of Embedded Systems and IoT, Design Methodology for IOT Products

## MODULE II - Overview of Open Source Hardware and Its relevance to IOT

**[09 Periods]**

Introduction and Programming Arduino Development Board , Working with Sensor Integration, Interfacing Input / Output devices (Pot, LDR, LCD, etc), Introduction to Network Connectivity, Concepts of IP based communication, Client – Server model of communication, Introduction to Wi-Fi communication using ESP8266, ESP8266 in Station & Access Point Mode

## MODULE III – Fundamentals of Python Programming & Raspberry PI

**[10 Periods]**

**A:** Introduction to python programming, working with functions, classes, REST full Web Services, Client Libraries.

**B:** Introduction & programming Raspberry Pi3, Integrating Input Output devices with Raspberry Pi3

## MODULE IV – IOT Platform: Cloud Computing Platforms for IOT Development (IBMCloud)[10Periods]

IOT Platform Architecture (IBM Internet of Things & Watson Platforms), API Endpoints for Platform Services , Devices Creation and Data Transmission, Introduction to NODE-RED and Application deployment

## MODULE V – IOT Use cases : Smart city Project & Industrial Use cases

**[10 Periods]**

Introduction to Smart City Project & IOT Use cases , Development of Smart city Applications , Project Work -1 (Smart city Use case) , Project Work-2 (Industrial Use case)

## TEXT BOOKS:

1. Internet of Things: A Hands-On Approach by by Arsheep Bahga,VijayMadisetti
2. The Internet of Things: Key applications and Protocols ‖ Wiley Publications 2nd Edition

## REFERENCES:

1. Embedded Systems: Real-Time Inter facing to Arm (r) Cortex-M Microcontrollers: Volume-1&2 by Jonathan WValvano
2. Designing the Internet of Things by Adrian McEwen, Hakim Cassimally, Wiley Publications,2012
3. Embedded Real Time Systems: Concepts, Design and Programming ‖by Dr.K.V.K.K.Prasad, Dream Tech Publication, 2003.

## E-RESOURCES:

1. <http://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx>
2. <http://electronicdesign.com/embedded/understanding-protocolsbehind-internet-> things
3. <http://eclipse.org/community/eclipse_newsletter/2014/february/articl>e2.php
4. <http://iot.eclipse.org/protocols.html>
5. <http://www.slideshare.net/paolopat/internet-ofthingsprotocolswar>
6. <http://www.slideshare.net/RealTimeInnovations/io-34485340>
7. <http://www.networkworld.com/article/2456421/internet-of-things/aguide-to-the-> confusing-internet-of-things-standards-world.html

## Course Outcomes:

At the end of the course, students will be able to

1. **Describe** the fundamental concepts of IoT and its applications
2. **Illustrate** M2M concepts with protocols.
3. **Develop** applications using Python Scripting Language.
4. **Build** real world applications by applying Ras pberryPI.
5. **Examine** web based services.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 2 | 3 | 3 | 3 | 3 | 3 | 3 |  |  |  |  |  | 3 | 3 | 3 |
| **CO2** | 3 | 2 | 3 | 2 | 3 |  |  |  |  |  |  | 2 | 3 | 3 | 3 |
| **CO3** | 3 | 3 | 3 | 3 | 3 |  |  |  |  |  |  | 3 | 3 | 3 | 3 |
| **CO4** | 3 | 3 | 3 | 3 | 3 | 3 |  |  |  |  |  | 3 | 3 | 3 | 3 |
| **CO5** | 3 | 3 | 3 | 3 | 3 |  |  |  |  |  |  | 3 | 3 | 3 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B0503** | **DISTRIBUTED SYSTEMS** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Computer Networks, DBMS and Operating Systems

## Course Objectives:

Student will be able to learn fundamental aspects of Distributed systems and analyze basics of Architectural and Fundamental Models. To identify various types of requirementsandtheprocessfor Distributedobjects.To makeuse ofvariousOSlayers to conceptualize and construct a system, to demonstrate different file systems tactics anddefineEventsandtimeorderingindistributedtransactions.

## MODULE I:BasicConcepts [09Periods]

Characterization of Distributed Systems – Examples – Resource Sharing and the Web

– Challenges – System Models – Architectural andFundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – CaseStudies.

**MODULE II: Processes andDistributedObjects [09 Periods]** Inter–process Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Client –Server Communication – Group Communication – Case Study – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications – JavaRMI – Case Study.

## MODULE III: Operating SystemIssuesI [10Periods]

The OS Layer – Protection – Processes and Threads – Communication andInvocation

– OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures–CryptographyPragmatics–CaseStudies– DistributedFile Systems– File Service Architecture – Sun Network File System – The AndrewFile System.

**MODULE IV: Operating SystemIssuesII [10 Periods]** Name Services – Domain Name System – Directory and Discovery Services – Global Name Service – X.500 Directory Service – Clocks – Events and Process States – SynchronizingPhysicalClocks–LogicalTimeAndLogicalClocks–GlobalStates– Distributed Debugging – Distributed Mutual Exclusion – Elections – Multicast Communication RelatedProblems.

**MODULE V: Distributed TransactionProcessing [10 Periods]** Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery – Overview of Replication And Distributed MultimediaSystems.

## TEXT BOOKS:

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems ConceptsandDesign”,3rdEdition,PearsonEducation,2002.
2. Andrew S. Tanenbaum, MaartenvanSteen, Distibuted Systems, “Principles and Pardigms”, Pearson Education,2002.

## REFERENCES:

1. SapeMullender,“DistributedSystems”,2ndEdition,AddisonWesley,1993.
2. Albert Fleishman, Distributes Systems, “Software Design and Implementation”, springer, Verlag,1994.
3. M.L.Liu,“DistributedComputingPrinciplesandApplications”,PearsonEducation, 2004.

E- **REFERENCES:**

1. <http://www.gecg.in/papers/ds5thedn.pdf>
2. <https://cs.uwaterloo.ca/~bernard/courses/cs454/0.Begin.pdf>
3. [https://www.cs.helsinki.fi/u/jakangas/Teaching/DistSys/DistSys-08f-1.pd](https://www.cs.helsinki.fi/u/jakangas/Teaching/DistSys/DistSys-08f-1.pdf)f
4. [https://courses.cs.ut.ee/MTAT.08.009/2014\_fall/uploads/Main/slides10-2.pd](https://courses.cs.ut.ee/MTAT.08.009/2014_fall/uploads/Main/slides10-2.pdf)f

## Course Outcomes:

At the end of the course, students will be able to:

1. Structuring distributed applications: using client-server andremote procedure calls.
2. Learnsinterprocesscommunicationanddistributedobjects.
3. DesignCryptographicAlgorithmsandsecurityissuesfordistributedsystems.
4. Assess distributed filesystems.
5. Orderingof events:usinglogicalandphysicalclocks.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COS** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** |  | 2 | 3 |  | 3 |  |  |  |  |  |  |  | 3 | 1 |  |
| **CO2** | 1 | 3 |  | 2 |  |  |  |  |  |  |  |  | 2 | 1 |  |
| **CO3** |  |  | 3 | 2 | 3 |  |  |  | 3 |  |  |  | 2 | 3 |  |
| **CO4** | 2 | 3 |  |  |  |  |  |  |  |  |  |  | 2 |  |  |
| **CO5** | 2 | 2 |  |  | 2 |  |  |  |  |  |  |  | 3 |  |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B0527** | **MULTIMEDIA ANDANIMATION ECHNIQUES** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Prerequisites:** Computer Graphics

## Course Objectives:

This course will enable the students to learn the fundamental concepts of animation, creatingflashanimationconcepts,learnthe3danimationtechniques,applythemotion capturesoftwareforanimationandanalyzevariouscolormodels.

## MODULEI:Introduction [09Periods]

What is mean by Animation – Why we need Animation – History of Animation– Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects -Creating Animation.

**MODULE II: Creating AnimationinFlash [10 Periods]** Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Time line and Twinbasedanimation -UnderstandingLayers–Actionscript.

**MODULE III: 3DAnimationEffects [10 Periods] A:** 3D Animation & its Concepts – Types of 3D Animation – Skeleton &Kinetic3D

Animation.

**B:** Texturing & Lighting of 3D Animation – 3D Camera Tracking –Applications & Software of 3D Animation.

**MODULE IV:MotionCapture [09 Periods]** Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Softwares’ – Script Animation Usage – Different Languages of Script Animation among theSoftware.

## MODULE V:ColorModel [10Periods]

Concept Development –Story Developing –Audio &Video – Color Model –Device IndependentColorModel– GammaandGammaCorrection-ProductionBudgets-3D AnimatedMovies.

## TEXT BOOKS:

1. Juke Parent, **“Computer Animation: Algorithms and Techniques**”, 3rd Edition,(Hardcover,RickParent).
2. Williams Richars, “**The Animator's Survival Kit--Revised Edition: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet”,** Faber & Faber,2012.

## REFERENCES:

1. Alex Michael, **“Animating with Flash MX Professional Creative Animation**

**Techniques”**, 1stedition Focal Press, 2003.

## E-RESOURCES:

1. <http://www.bkstr.com/floridastore/home> Autodesk Maya2016
2. https://itunes.apple.com/us/app/the-animators-survival-kit/id627438690?mt=8
3. <http://ieeexplore.ieee.org/document/7239940/>
4. nptel.ac.in/courses/106102063/25

## Course Outcomes:

At the end of the course, students will be able to

1. **Understand** fundamental concepts ofanimation.
2. **Implement** animation using flashconcepts.
3. **Outline**thescriptingconceptsin3Danimationmethods.
4. **Analyze**thedifferentlanguagesofscriptinganimationtechniques.
5. **Apply**thestorydevelopingandcolormodelin3Danimatedmovies.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COS** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | 2 |  |  | 2 |  |  |  |  |  |  | - | 1 |  |  |
| **CO2** |  |  | 3 |  | 3 |  |  |  |  |  |  | 3 |  | 2 |  |
| **CO3** |  |  |  |  | 3 |  |  |  |  |  |  | - |  | 2 |  |
| **CO4** |  |  |  | 2 |  |  |  |  |  |  |  | - |  |  |  |
| **CO5** |  |  | 3 |  | 3 |  |  |  |  |  |  | 3 |  | 3 | 3 |

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| **2021-22**  **Onwards(MR-21)** | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VISemester** | | |
| **Code:B6206** | **CRPTOGRAPHY AND NETWORK**  **SECURITYLAB** | **L** | **T** | **P** |
| **Credits:1.5** | **-** | **-** | **3** |

#### List of Experiments:

1. Write a C program that contains a string (char pointer) with a value ï¿½Hello worldï¿½.

The program should XOR each character in this string with 0 and displays the result.

1. Write a C program that contains a string (char pointer) with a value ï¿½Hello worldï¿½.

The program should AND or and XOR each character in this string with 127 and display the result.

1. Write a Java program to perform encryption and decryption using the following algorithms
   1. Ceaser cipher
   2. Substitution cipher
   3. Hill Cipher
2. Write a C/JAVA program to implement the DES algorithm logic.
3. Write a C/JAVA program to implement the Blowfish algorithm logic.
4. Write a C/JAVA program to implement the Rijndael algorithm logic.
5. Write the RC4 logic in Java Using Java cryptography; encrypt the text ï¿½Hello worldï¿½

using Blowfish. Create your own key using Java key tool.

1. Write a Java program to implement RSA algorithm.
2. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
3. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
4. Calculate the message digest of a text using the MD5 algorithm in JAVA.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO3** | 2 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |
| **CO5** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech. VSemester** | | |
| **Code: B6207** | **AUTOMATA AND COMPILER DESIGN LAB** | **L** | **T** | **P** |
| **Credits: 1.5** | **-** | **-** | **3** |

## Prerequisites: NIL Course Objectives:

Thiscourseoutlinesthemajorconceptareasoflanguagetranslationandvariousphases of compiler, extend the knowledge of parser by parsing LL parser and LR parser, analyzetheintermediateformsandtheroleofsymboltable,classifycodeoptimization techniquesandanalyzethedataflowanddevelopmachinecodegenerationalgorithms.

**Software Requirements:** C++ Compiler / JDK kit, (LEX, YACC) / UBUNTU

## List of Programs:

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal.

The syntax of the language is defined by the following BNF grammar:

<program> ::= <block>

<block> ::= { <variabledefinition><slist> } | { <slist> }

<variabledefinition> ::= int<vardeflist>;

<vardeflist> ::= <vardec> | <vardec>, <vardeflist>

<vardec> ::= <identifier> | <identifier> [ <constant> ]

<slist> ::= <statement> | <statement>; <slist>

<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block> |

<printstatement> | <empty>

<assignment> ::= <identifier> = <expression> | <identifier> [ <expression> ] =

<expression>

<ifstatement> ::= <bexpression> then <slist> else <slist> endif | if <bexpression> then

<slist> endif

<whilestatement> ::= while <bexpression> do <slist> enddo

<print statement> ::= print ( <expression> )

<expression> ::= <expression><additionop><term> | <term> | addingop><term>

<bexpression> ::= <expression><relop><expression>

<relop> ::= < | <= | == | >= | > | !=

<addingop> ::= + | -

<term> ::= <term><mulitop><factor> | <factor>

<muli top> ::= \* | /

<factor> ::= <constant> | <identifier> | <identifier> [ <expression> ] | ( <expression>

)

<constant> ::= <digit> | <digit><constant>

<identifier> ::= <identifier><letterordigit> | <letter>

<letterordigit> ::= <letter> | <digit>

<letter> ::= a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z

<digit> ::= 0|1|2|3|4|5|6|7|8|9

<empty> has the obvious meaning

Comments (zero or more characters enclosed between the standard C / Java style comment brackets /\*...\*/) can be inserted. The language has rudimentary support for 1-dimensional arrays. The declaration

int a[3] declares an array of three elements, referenced as a[0], a[1] and a[2] Note also that you should worry about the scoping of names.

A simple program written in this language is:

{

int a[3], t1, t2; t1 = 2;

a[0] = 1; a[1] = 2; a[t1] = 3;

t2 = -(a[2] + t1 \* 6)/ a[2] - t1);

if t2 > 5 then print(t2); else

{

int t3; t3 =99;

t2 =-25;

print(-t1 + t2 \* t3); /\* this is a comment on 2 lines \*/

}

endif

}

1. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonablevalue.
2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generatingtools.
3. WriteaCprogramtorecognizestringsunder'a\*','a\*b+','abb'
4. WriteaCprogramtotestwhetheragivenidentifierisvalidornot
5. Write a Program for Implementation ofrecursive descent Parser.
6. DesignPredictiveparserforthegivenlanguage.
7. Writeaprogramtocalculatefirstfunctionforthegivengrammar.
8. Write a Program forImplementation of Shift Reduce parsing
9. WriteaprogramtoDesignpredictiveparserorLL(1)parserforthegivengrammar.
10. DesignLALRbottomupparserfortheabovelanguage.
11. Convert the BNF rules into Yaccform and write code to generate abstract syntax tree.
12. Write program to generate machine code fromthe abstract syntax tree generated by theparser.

The following instruction set may be considered as target code.

Thefollowingisasimpleregister-based machine,supportingatotalof17instructions. Ithasthreedistinctinternalstorageareas.Thefirstisthesetof8registers,usedbythe individualinstructionsasdetailedbelow,thesecondisanareausedforthestorageof variablesandthethirdisanareausedforthestorageofprogram.Theinstructionscan beprecededbyalabel.Thisconsistsofanintegerintherange1to9999andthelabel isfollowedbyacolontoseperateitfromtherestoftheinstruction.Thenumericallabel canbeusedastheargumenttoajumpinstruction,asdetailedbelow.

In the description of the individual instructions below, instruction argument types are specified as follows:

R specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc). L specifies a numerical label (in the garbage 1 tp 9999).

V specifies a "variable location" ( a variable number, or a variable location pointed to

by a register - see below).

A specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows: LOAD A, R

loads the integer value specified by A into register R. STORE R, V

stores the value in register R to variableV. OUTR

outputs the valuein register R. NEGR

negates the value in register R. ADD A, R

adds the value specified by A to register R, leaving the result in register R. SUB A, R

subtracts the value specified by A from register R, leaving the result in register R. MUL A, R

multiplies the value specified by A by register R, leaving the result in register R. DIV A, R

divides register R by the value specified by A, leaving the result in register R. JMP L

causesanunconditionaljumptotheinstructionwiththelabelL. JEQ R,L

jumpstotheinstructionwiththelabelLifthevalueinregisterRiszero. JNE R,L

jumpstotheinstructionwiththelabelLifthevalueinregisterRisnotzero. JGE R,L

jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

JGT R, L

jumps to the instruction with the label L if the value in register R is greater than zero.

JLE R, L

jumps to the instruction with the label L if the value in register R is less than or equal to zero.

JLT R, L

jumps to the instruction with the label L if the value in register R is less than zero. NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a STOP instruction.

## TEXT BOOKS:

1. A.V.Aho.J.D.Ullman,”**Principlesofcompilerdesign**”,PearsonEducation.
2. Andrew N. Appel, ”**Modern Compiler Implementation in C**”, Cambridge UniversityPress.
3. D.M Dhamdhere, **Systemsprogrammingandoperating systems**” ,2ndedition,tataMcGrawhillpublishingcomppvt.Ltd.

## REFERENCES:

1. JohnR.Levine,TonyMason,DougBrown,”**Lex&yacc**”,O’reilly
2. DickGrune,HenryE.Bal,CarielT.H.Jacobs,”**ModernCompilerDesign**”,Wiley dreamtech.
3. Cooper&Linda,” **Engineering a Compiler**”, Elsevier.
4. Louden,” **Compiler Construction**”,Thomson.

## Course Outcomes:

At the end of the course, students will be able to

1. **Apply**theknowledgeof lextool&yacctooltodevelopascanner&parser.
2. **Develop**programforsolvingparserproblems.
3. **Create** program forintermediate code generation.
4. **Write**codetogenerateabstractsyntaxtreeandtoconvertBNFtoYACC.
5. **Implement** target code from the abstract syntaxtree.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO3** | 2 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |
| **CO5** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VI Semester** | | |
| **Code:B0M03** | **Quantitative Aptitude - II**  **(Common for CE, EEE, ME, ECE, CSE, IT and**  **Mi.E)** | **L** | **T** | **P** |
| **Credits: NIL** | **2** | **-** | **-** |

## Pre requisites: NIL

**Quants: Number System (NS)**

**Number Systems-**Factors and Multiples: The H.C.F. of two or more than twonumbers; Factorization Method Division Method; Finding the H.C.F. of more than two numbers; product of two numbers = Product of their H.C.F. and L.C.M.;Co-primes;H.C.F.and L.C.M.ofFractions:ComparisonofFractions.

## Verbal: Articles, Para Jumbles

**Articles-** Types of articles, Countable nouns, Uncountable nouns, Usage ofarticles, Omission ofarticles.

**Para Jumbles**- Para Jumbles, Types of Para Jumbles, Strategies to answer questions on JumbledParagraphs.

## Logical: Data Arrangements, Blood Relation

**Data Arrangements-** Linear Arrangement, Circular Arrangement, Multi- DimensionalArrangement.

**BloodRelations-**Classificationofbloodrelations,Pointingaperson,Equation

related problems.

## Module–II[6periods]

**Quants: Time and Distance, Pipes**

**Time & Distance-**;Km/hr to m/sec conversion; m/sec to km/hr conversion**;** over certain distance at x km/hr and an equal distance at y km/hr

## Verbal: Sentence Completion, Prepositions

**Sentence Completion-** Formats of Question; Strategies to solve sentence completion questions- Proactive and reactive solving, Identifying clues- Signposts,Typesofsignposts,Rootwords,Sentencestructureclues.

**Prepositions-** Definition, Types of prepositions, Preposition of Place, Preposition of Time, Preposition of Direction, Compound Prepositions, PrepositionalPhrases.

## Logical: Coding and Decoding

**Coding and Decoding-**Number Series, Alphabet Series, Analogy, Odd ManOut, VisualReasoning.

## Module–III [6periods]

**Quants: Ages, Progression, Logarithms**

**Ages, Progression-**; Arithmetic progression; Arithmetic mean; Geometric progression andmean

**Logarithms-**Why logarithms: Properties of Logarithms: Laws of logarithm: Characteristic oflogarithm:

## Verbal: Vocabulary: Vocabulary-Etymology, Root Words, Prefixes and Suffixes; Synonyms andAntonyms,TipstosolvequestionsonSynonymsandAntonyms;WordAnalogy, PatternsofquestionsonWordAnalogy;MiscellaneousVocabulary.

## Logical: Data Interpretation and Data Sufficiency

**DataInterpretation-**Tables,Piecharts,BarGraphs,Linegraphs

**Data Sufficiency-**Strategies tosolve.

## Module–IV [6periods]

**Quants: Permutations and Combinations, Probability**

**Permutations-**Factorial Notation: The different arrangements; Number ofPermutations: number of all permutations of n things, taken all at a time; nsubjectsofwhichp1arealikeofonekind;p2arealikeofanotherkind; p3are alikeofthirdkind;Numberof Combinations:Thenumberofallcombinations ofnthings,takenratatime.

## Verbal: Sentence Correction

**Sentence Correction-** Subject-Verb Agreement; Modifiers; Parallelism; Pronoun- Antecedent Agreement; Verb Time Sequence; Comparisons; Determiners; ExerciseQuestions.

## Logical: Clocks and Calendars

**Clocks:** Introduction, Derivation of angles, Angles between hands of the clock, Handstogether,Handsatangulardistance,Gain&Lossproblems.

**Calendars:** - Leap year-Non leap year, Odd days, Finding the day from date,Repeatedyears.

## Module-V: [6periods]

**Quants: Areas and Volumes (Mensuration)**

**Areas &Volumes-**Pythagoras Theorem Results on Quadrilaterals Perimeter; Area of a circle Circumference Length of an arc Area of a sector; Area of a triangle.

## Verbal: Reading Comprehension, Critical Reasoning

**ReadingComprehension-**Speedreadingstrategies;ReadingComprehension

- types of questions, tackling strategies; Critical Reasoning.

## Logical: Directions, Cubes, Syllogisms

**Directions-**Introduction,Directionbasedquestions,Shadowbasedproblems.

**Cubes**-Cube&cuboidconcepts,3-2-1-0facedproblems.

**Syllogisms**-StatementsandConclusion,SyllogismsusingVennDiagrams

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | |
| **COs** | **Programme Outcomes (POs)** | | | | | | | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  |  | 2 |  | 2 |  |  |  | 2 |
| **CO2** |  |  |  |  |  | 2 |  | 2 |  |  |  | 2 |
| **CO3** |  |  |  |  |  | 2 |  | 2 |  |  |  | 2 |
| **CO4** |  |  |  |  |  | 2 |  | 2 |  |  |  | 2 |
| **CO5** |  |  |  |  |  | 2 |  | 2 |  |  |  | 2 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VI Semester** | | |
| **Code: B0H08** | **ENGINEERING ECONOMICS AND**  **ACCOUNTANCY** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

## Prerequisites: NIL

**Course Objectives:** EEA is a think beyond program which will make the student to examine the application of microeconomics theory as applied to the manager’s responsibilities in an organization. To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making. This course should emphasize the quantitative and qualitative applications of economic principle to business analysis

**MODULE-1 Business Environment and Managerial Economics [10 Periods] Business Environment**: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Latest trends in Business Environment (Entrepreneurship).

**Managerial Economics:** Definition, Nature and Scope of Managerial Economics– Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand, Types, Significance of Elasticity of Demand, Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

**MODULE – II Theory of Production and Cost Analysis [10 Periods] Theory of Production:** Production Function – ISO quants and ISO costs, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

**Cost Analysis:** Cost concepts, Opportunity cost, fixed vs. Variable costs, explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEA.

## MODULE – III Market structures and Pricing Policies [09Periods]

1. **Introduction to Markets & Market structures:** Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.
2. **Pricing Policies & Methods:** Cost plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, PLC based pricing methods.

**MODULE – IV Capital and Capital Budgeting [09 Periods] Capital:** Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

**Capital Budgeting:** Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

## MODULE – V Financial Accounting and Ratios [10Periods]

**Financial Accounting:** Introduction, Accounting principles, Accounting Cycle, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

**Financial Analysis Through Ratios:** Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

## TEXT BOOKS:

* 1. Aryasri, “**Managerial Economics and Financial Analysis**”, TMH, 2ndedition, 2005.
  2. Varshney&Maheswari,“**ManagerialEconomics**”,5theditionSultanChand,2003

## REFERENCES:

1. H. Craig Peterson & W. Cris Lewis, “**Managerial Economics**”, PHI,4th Edition.
2. Domnick Salvatore, “**Managerial Economics In a Global Economy**”, Thomson, 4th Edition.
3. Raghunatha Reddy &Narasimhachary, “**Managerial Economics & Financial**

**Analysis**”, 4th Edition Scitech.

1. S.N.Maheswari&S.K.Maheswari,“**FinancialAccounting**”,6thEdition Vikas.
2. Dwivedi,“**ManagerialEconomics**”,Vikas,6thEdition.

## E-RESOURCES:

1. <http://www.learnerstv.com/Free-Economics-video-lecture-courses.htm>
2. <http://nptel.ac.in/courses/110105067/>
3. <http://nptel.ac.in/courses/110107073/>
4. <http://nptel.ac.in/courses/110101005/>
5. <http://nptel.ac.in/courses/109104073/>

## Course Outcomes:

At the end of the course, students will be able to

1. Understand the concepts of managerial economics and their application in evaluating the demand.
2. Evaluatetheproductionfunctionandidentifiestheleastcostcombinationtocontrol the costs of production.
3. Understandthestructuresofvariousmarkettypesandtheirpricingpolicies.
4. Understand the types of business forms and also be able to evaluate the investments using capital budgeting techniques.
5. Understandthebasicconceptsoffinancialaccountingandevaluationofcompany performance using ratio analysis.

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | | | | |
| **COS** | | **Programme Outcomes(POs)** | | | | | | | | | | | | | | | | |
| **PO1** | **PO2** | | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | | **PO11** | | | **PO12** | |
| **CO1** | |  | 2 | |  |  |  |  |  |  | 1 |  | | 3 | | |  | |
| **CO2** | | 3 |  | |  | 2 | 1 |  |  |  |  |  | |  | | |  | |
| **CO3** | |  | 1 | |  |  | 2 |  |  |  |  |  | | 3 | | |  | |
| **CO4** | | 2 | 1 | |  |  | 3 |  |  |  |  |  | |  | | |  | |
| **CO5** | |  | 1 | |  |  | 2 |  |  |  |  |  | | 3 | | |  | |
| **2021-22**  **Onwards(MR-21)** | | | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | | | | | | | | | **B.Tech.**  **VISemester** | | | | |
| **Code:B6208** | | | **ETHICAL HACKING** | | | | | | | | | **L** | | **T** | **P** | |
| **Credits:3** | | | **3** | | **-** | **-** | |

**Prerequisites:**

* A course on “Operating Systems”
* A course on “Computer Networks”
* A course on “Network Security and Cryptography”

**Course Objectives:**

* The aim of the course is to introduce the methodologies and framework of ethical hacking for enhancing the security.
* The course includes-Impacts of Hacking; Types of Hackers; Information Security Models; Information Security Program; Business Perspective; Planning a Controlled Attack; Framework of Steps (Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Deliverable and Integration)

**MODULE – I: Introduction**

Hacking Impacts, The Hacker Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration Information Security Models: Computer Security, Network Security, Service Security, Application Security, Security Architecture Information Security Program: The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking

**MODULE – II: The Business Perspective**

Business Objectives, Security Policy, Previous Test Results, Business Challenges Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, Timing is Everything, Attack Type, Source Point, Required Knowledge, Multi-Phased Attacks, Teaming and Attack Structure, Engagement Planner, The Right Security Consultant, The Tester, Logistics, Intermediates, Law Enforcement

**MODULE – III: Preparing for a Hack**

Technical Preparation, Managing the Engagement Reconnaissance: Social Engineering, Physical Security, Internet Reconnaissance

**MODULE – IV:Enumeration**

Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase Exploitation: Intutive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern

**MODULE -V: Deliverable**

The Deliverable, The Document, Overal Structure, Aligning Findings, Presentation Integration: Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion

**TEXT BOOK**

* James S. Tiller, “The Ethical Hack: A Framework for Business Value Penetration Testing”, Auerbach Publications, CRC Press

**REFERENCE BOOKS**

* EC-Council, “Ethical Hacking and Countermeasures Attack Phases”, Cengage Learning
* Michael Simpson, Kent Backman, James Corley, “Hands-On Ethical Hacking and Network Defense”, Cengage Learning

**Course Outcomes:**

* Gain the knowledge of the use and availability of tools to support an ethical hack
* Gain the knowledge of interpreting the results of a controlled attack
* Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
* Comprehend the dangers associated with penetration testing

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| **CO-PO,PSOMapping**  **(3/2/1indicatesstrengthofcorrelation)3-Strong,2-Medium,1-Weak** | | | | | | | | | | | | | | | |
| **CO** | **ProgrammeOutcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **sPO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO1**  **0** | **PO1**  **1** | **PO1**  **2** | **PSO**  **1** | **PSO**  **2** | **PSO**  **3** |
| **CO** | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 2 |
| **CO** | 1 | 1 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 1 |
| **CO** | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 2 |  |  |  |  |  |  | 2 | 2 | 1 | 3 |

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| **2021-22**  **Onwards(MR-21)** | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VI Semester** | | |
| **Code:B0536** | **DATA MINING** | **L** | **T** | **P** |
| **Credits:3** | **3** | **-** | **-** |

## Pre requisites: NIL

**Course Objectives:**

This course provides the students to understand stages in building a Data Warehouse,identifytheneedandimportanceofpreprocessingtechniques,implementsimilarityanddissimilaritytechniques,analyzeandevaluateperformanceofalgorithmsforAssociationRules,analyzeClassificationandClusteringalgorithms.

**MODULEI: Introduction and Mining Issues & Data [09Periods]**

**Introduction-** Why Data Mining? What Is Data Mining? What Kinds of Data Can Be mined? What Kinds of Patterns Can Be Mined? Which Technologies Are Used? Which Kinds of Applications Are Targeted?

**Mining Issues and Data-**Major Issues in Data Mining, Types of Data, Data Quality

**MODULE II: Data, Measuring Data Similarity and Dissimilarity [10 Periods]**

**Data –** Data Pre-processing, Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation, Data Discretization and Binarization, Variable transformation.

**Measuring Data Similarity and Dissimilarity-** Similarity and Dissimilarity between simple attributes, Dissimilarities and similarities between data objects, Examples of Proximity measures, Issues in Proximity Calculation, Selection of right proximity measure.

**MODULEIII: Classification and Techniques [09Periods]**

**A: Classification** -Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Working of Decision Tree, building a decision tree .**B:** **Techniques-**Methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.

**MODULEIV:** **Classifier and** **Association** **Analysis [10Periods]**

**Classifiers -**Alterative Techniques**,** Bayes’ Theorem, Naïve Bayesian Classification, Bayesian Belief Networks

**Association Analysis -** Basic Concepts and Algorithms: Problem Definition, Frequent Item Set generation, Rule generation, compact representation of frequent item sets, FP-Growth Algorithm

**MODULEV: Cluster Analysis and DBSCAN [10Periods] Cluster Analysis-** Basic Concepts and Algorithms: Overview: What Is Cluster Analysis? Different Types of Clustering, Different Types of Clusters; K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, Strengths and Weaknesses; Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm.

**DBSCAN-** Traditional Density Center- Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.

**TEXTBOOKS:**

1. Pang-Ning Tan & Michael Steinbach, “**Introduction to DataMining**”, VipinKumar, Pearson.
2. JiaweiHan,MichelKamber,”**DataMiningconceptsandTechniques**”,3/e,

Elsevier.

## REFERENCES:

1. HongboDu,“**DataMiningTechniquesandApplications:AnIntroduction**”,CengageLearning.
2. Vikram PudiandP. Radha Krishna, “**DataMining**”, Oxford.
3. MohammedJ.Zaki,WagnerMeira,Jr,”**Data Mining and Analysis-fundamental Concepts and Algorithms**”,Oxford
4. Alex Berson,StephenSmith,”**Data Warehousing Data Mining & OLAP**”,TMH.

## E-RESOURCES:

1. <http://www-users.cs.umn.edu/~kumar/dmbook/index.php>
2. [http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-](http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf)

[Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf](http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf)

1. <http://www.ijctee.org/files/Issuethree/IJCTEE_1111_20.pdf>
2. [http://www.ccsc.org/southcentral/E-Journal/2010/Papers/Yihao%20final%20paper](http://www.ccsc.org/southcentral/E-Journal/2010/Papers/Yihao%20final%20paper%20%20CCSC%20for%20submission.pdf)

[%20CCSC%20for%20submission.pdf](http://www.ccsc.org/southcentral/E-Journal/2010/Papers/Yihao%20final%20paper%20%20CCSC%20for%20submission.pdf)

1. <https://gunjesh.wordpress.com/>

## Course Outcomes:

At the end of the course, students willbe able to

1. **Acquire** knowledge in building a DataWarehouse
2. **Understand** the need and importance of preprocessing techniques
3. **Implement** Similarity and dissimilarity techniques
4. **Analyze** and evaluate performance of algorithms for Association Rules.
5. **Deploy** Classification and Clustering algorithms

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| **CO-PO, PSO Mapping**  **(3/2/1indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **CO** | **Programme Outcomes (POs)** | | | | | | | | | | | | **PSOs** | | |
| **sPO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO1**  **0** | **PO1**  **1** | **PO1**  **2** | **PSO**  **1** | **PSO**  **2** | **PSO**  **3** |
| **CO** | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 2 |
| **CO** | 1 | 1 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 1 |
| **CO** | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 2 |  |  |  |  |  |  | 2 | 2 | 1 | 3 |

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| **2021-22**  **Onwards(MR-21)** | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VI Semester** | | |
| **Code:B6209** | **CRYPT ANALYSIS** | **L** | **T** | **P** |
| **Credits:3** | **3** | **-** | **-** |

**Prerequisites:** A Course on “Computer Networks, Mathematics”.

**Course Objectives:**

* To understand the importance of cryptanalysis in our increasingly computer- driven world.
* To understand the fundamentals of Cryptography
* To understand the Lattice- based cryptanalysis and elliptic curves andpairings
* To understand birthday- based algorithms for functions and attacks on streamciphers
* To apply the techniques for secure transactions in real worldapplications

# MODULE- I

**A bird’s – eye view of modern Cryptography:** Preliminaries, Defining Security in Cryptography **Monoalphabetic Ciphers:** Using Direct Standard Alphabets, The Caesar Cipher, Modular arithmetic, Direct Standard alphabets, Solution of direct standard alphabets by completing the plain component, Solving direct standard alphabets by frequency considerations, Alphabets based on decimations of the normal sequence, Solution of decimated standard alphabets, Monoalphabets based on linear transformation. **Polyalphabetic Substitution:** Polyalphabetic ciphers, Recognition of polyalphabetic ciphers, Determination of number of alphabets, Solution of individual alphabets if standard, Polyalphabetic ciphers with a mixed plain sequence, Matching alphabets, Reduction of a polyalphabetic cipher to a monoalphabetic ciphers with mixed cipher sequences

# MODULE - II

**Transposition:** Columnar transposition, Solution of transpositions with Completely filled rectangles, Incompletely filled rectangles, Solution of incompletely filled rectangles – Probable word method, Incompletely filled rectangles general case, Repetitions between messages; identical length messages. **Sieve algorithms:** Introductory example: Eratosthenes’s sieve, Sieving for smooth composites

# MODULE - III

**Brute force Cryptanalysis:** Introductory example: Dictionary attacks, Brute force and the DES Algorithm, Brute force as a security mechanism, Brute force steps in advanced cryptanalysis, Brute force and parallel computers. **The birthday paradox: Sorting or not?:** Introductory example: Birthday attacks on modes of operation, Analysis of birthday paradox bounds, Finding collisions, Application to discrete logarithms in genericgroups.

# MODULE - IV

**Birthday- based algorithms for functions:** Algorithmic aspects, Analysis of random functions, Number-theoretic applications, A direct cryptographic application in the context of blockwise security, Collisions in hash functions. **Attacks on stream ciphers:** LFSR- based key stream generators,

Correlation attacks, Noisy LFSR model, Algebraic attacks, Extension to some non- linear shift registers, The cube attack.

# MODULE - V

**Lattice- based cryptanalysis:** Direct attacks using lattice reduction, Coppersmith’s small roots attacks. **Elliptic curves and pairings:** Introduction to elliptic curves, The Weil pairing, the elliptic curve factoringmethod.

# Text Books:

1. Elementary Cryptanalysis A Mathematical Approach by Abraham Sinkov, The mathematical Association of America(lnc).
2. Algorithmic Cryptanalysis” by Antoine joux, CRCPress’

# References:

1. Algebraic Cryptanalysis, Bard Gregory, Springer,2009
2. Cryptanalysis of Number Theoretic Ciphers, Sameul S. Wag staff, Champan&Hall/CRC.
3. Cryptanalysis: A Study of Cipher and Their Solution, Helen F.Gaines,1989

# Course Outcomes:

* Ability to apply cryptanalysis in system design to protect it from variousattacks.
* Ability to identify and investigate vulnerabilities and security threats and the mechanisms to counter them.
* Ability to analyze security of cryptographic algorithm against brute force attacks, birthday attacks.

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| **CO-PO,PSOMapping**  **(3/2/1indicatesstrengthofcorrelation)3-Strong,2-Medium,1-Weak** | | | | | | | | | | | | | | | |
| **CO** | **ProgrammeOutcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **sPO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO** | **PO1**  **0** | **PO1**  **1** | **PO1**  **2** | **PSO**  **1** | **PSO**  **2** | **PSO**  **3** |
| **CO** | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 2 |
| **CO** | 1 | 1 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 |  | 1 |
| **CO** | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  | 1 | 1 | 1 | 1 |
| **CO** | 1 | 2 | 2 | 2 | 2 |  |  |  |  |  |  | 2 | 2 | 1 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **M.Tech II Sem** | | |
| **Code: B6210** | **ADVANCED WIRELESS NETWORKS** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Pre-Requisites:** Computer Networks

**Course Objectives:**

* The students should get familiar with the wireless/mobile market and the future needs and challenges.
* To get familiar with key concepts of wireless networks, standards, technologies and their basic Operations.
* To learn how to design and analyse various mediumaccess.
* To learn how to evaluate MAC and network protocols using network simulation softwaretools.
* The students should get familiar with the wireless/mobile market and the future needsand challenges.

**Course Outcomes:** After completion of course, students would be able to:

* Demonstrate advanced knowledge of networking and wireless networking and understand various types of wireless networks, standards, operations and usecases.
* Be able to design WLAN, WPAN, WWAN, Cellular based upon underlying propagation and performanceanalysis.
* Demonstrate knowledge of protocols used in wireless networks and learn simulating wireless networks.
* Design wireless networks exploring trade-offs between wire line and wirelesslinks.
* Develop mobile applications to solve some of the real-worldproblems.

# MODULE - I

**Introduction:**

Wireless Networking Trends, Key Wireless Physical Layer Concepts, Multiple Access Technologies - CDMA, FDMA, TDMA, Spread Spectrum technologies, Frequency reuse, Radio Propagation and Modelling, Challenges in Mobile Computing: Resource poorness, Bandwidth, energy etc.

# Wireless Local Area Networks:

IEEE 802.11 Wireless LANs Physical & MAC layer, 802.11 MAC Modes (DCF& PCF) IEEE 802.11 standards, Architecture & protocols, Infrastructure vs. Adhoc Modes, Hidden Node & Exposed Terminal Problem, Problems, Fading Effects in Indoor and outdoor WLANs, WLAN Deployment issues

# MODULE – II

**Wireless Cellular Networks:**

1G and 2G, 2.5G, 3G, and 4G, Mobile IPv4, Mobile IPv6, TCP over Wireless Networks, Cellular architecture, Frequency reuse, Channel assignment strategies, Handoff strategies, Interference and system capacity, Improving coverage and capacity in cellular systems, Spread spectrum Technologies.

# MODULE - III

WiMAX (Physical layer, Media access control, Mobility and Networking), IEEE802.22 Wireless Regional Area Networks, IEEE 802.21 Media Independent Handover Overview

# Wireless Sensor Networks:

Introduction, Application, Physical, MAC layer and Network Layer, Power Management, Tiny OS Overview.

# MODULE - IV

**Wireless PANs:**

Bluetooth AND Zigbee, Introduction to Wireless Sensors,.

# MODULE - V

**Security:**

Security in wireless Networks Vulnerabilities, Security techniques, Wi-Fi Security, DoS in wireless communication.

# Advanced Topics

IEEE 802.11x and IEEE 802.11i standards, Introduction to Vehicular Adhoc Networks

# References:

1. Schiller J., Mobile Communications, Addison Wesley2000
2. Stallings W., Wireless Communications and Networks, Pearson Education2005
3. Stojmenic Ivan, Handbook of Wireless Networks and Mobile Computing, John Wiley and Sons Inc2002
4. Yi Bing Lin and Imrich Chlamtac, Wireless and Mobile Network Architectures, John Wiley and Sons Inc2000
5. Pandya Raj, Mobile and Personal Communications Systems and Services, PHI200

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VIII Semester** | | |
| **Code: B0532** | **MOBILE COMPUTING** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

##### Prerequisites: **NIL**

**MODULE I:**

Mobile Computing: Novel Applications, Limitations of Mobile Computing, Mobile Computing Architecture: Programming languages, Functions of Operating Systems, Functions of Middleware for mobile Systems, Mobile Computing Architectural layers, Protocols, Layers.

**MODULE II:**

Mobile Devices: Handheld Mobile Smartphones with Multimedia Functionalities, Smartcards, Smart Sensors,Mobile System Networks: Cellular Network, WLAN Network and Mobile IP, Ad-hoc Networks, Mobility Management

**MODULE III:**

Global System For Mobile Communications (Gsm): Mobile Services, System Architecture, Protocols, Localization & Calling, Handover, Security. GPRS: GPRS System Architecture, UMTS: UMTS System Architecture. LTE: Long Term Evolution

**MODULE IV:**

Mobile Network Layer: Mobile IP: Goals, Assumptions, Entities and Terminology, IP Packet Delivery, Agent Discovery, Registration, Tunneling and Encapsulation, Optimizations, Dynamic Host Configuration Protocol (DHCP) Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP, TCP over 2.5G/3G Wireless Networks.

**MODULE V:**

Security Issues in Mobile Computing: Introduction, Information Security, Security Techniques and Algorithms, Security Protocols, Security Models, Security Frameworks for mobile Environment.

**TEXT BOOKS:**

1. Raj Kamal, “Mobile Computing”, OXFORD UNIVERSITY PRESS.

2. Asoke K Talukder, et al, “Mobile Computing”, Tata McGraw Hill, 2008.

**REFERENCES:**

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Second Edition, 2008.

2. Dr. Sunilkumar, et al “Wireless and Mobile Networks: Concepts and Protocols”, Wiley India.

3. Matthew S.Gast, “802.11 Wireless Networks”, SPD O’REILLY.

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0539** | **Information Retrieval Systems** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Pre-requisite:** DataStructures

**Course Objectives:**

* TolearntheimportantconceptsandalgorithmsinIRS
* Tounderstandthedata/filestructuresthatarenecessarytodesign,andimplementinformationretrieval(IR)systems.

**MODULE I**

IntroductiontoInformationRetrievalSystems:DefinitionofInformationRetrievalSystem,ObjectivesofInformationRetrievalSystems,FunctionalOverview,RelationshiptoDatabaseManagementSystems,DigitalLibrariesand DataWarehouses

Information Retrieval System Capabilities: Search Capabilities, Browse Capabilities, MiscellaneousCapabilities

**MODULEII**

Cataloging and Indexing: History and Objectives of Indexing, Indexing Process, Automatic Indexing,InformationExtraction

Data Structure: Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-GramData Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures,HiddenMarkovModels

**MODULE III**

Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, ConceptIndexing,HypertextLinkages

Document and Term Clustering: Introduction to Clustering, Thesaurus Generation, Item Clustering,Hierarchy ofClusters

# MODULE IV

UserSearchTechniques:SearchStatementsandBinding,SimilarityMeasuresandRanking,Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of BooleanSystems,Searching theINTERNETand Hypertext

InformationVisualization:IntroductiontoInformationVisualization,CognitionandPerception,InformationVisualizationTechnologies

**MODULE V**

Text Search Algorithms: Introduction to Text Search Techniques, Software Text Search Algorithms,HardwareTextSearchSystems

Multimedia Information Retrieval: Spoken Language Audio Retrieval, Non-Speech Audio Retrieval,GraphRetrieval,ImageryRetrieval,Video Retrieval

# TEXTBOOK:

1.InformationStorageandRetrievalSystems–TheoryandImplementation,SecondEdition,GeraldJ.Kowalski,MarkT.Maybury,Springer

# REFERENCES

1. Frakes,W.B.,RicardoBaeza-Yates:InformationRetrievalDataStructuresandAlgorithms,PrenticeHall,1992.
2. InformationStorage& RetrievalBy RobertKorfhage–JohnWiley&Sons.
3. ModernInformationRetrievalByYatesandNetoPearsonEducation.

# CourseOutcomes:

* AbilitytoapplyIRprinciplestolocaterelevantinformationlarge collectionsofdata
* Abilitytodesigndifferentdocument clusteringalgorithms
* Implement retrievalsystemsforwebsearchtasks.
* DesignanInformationRetrievalSystemforwebsearchtasks.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | 1 |  | 1 |  | 1 |  |  |  |  |  | 1 | 1 |  |  |
| **CO2** | 1 | 2 | 1 | 1 | 1 | 1 |  |  |  |  |  | 1 |  | 2 | 1 |
| **CO3** | 1 | 1 | 2 | 2 | 1 | 1 |  |  |  |  |  | 2 |  | 2 | 2 |
| **CO4** | 1 | 1 | 1 | 2 | 1 | 1 |  |  |  |  |  | 3 |  | 1 | 2 |
| **CO5** | 1 | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  | 2 |  | 1 | 2 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **IT SECURITY METRICS** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Learning Objectives:**

To learn security metrics.

To learn The Security Process Management Framework.

To learn Measurements Security Operations.

To learn Measuring Security Cost and Value.

To learn The Security Improvement Program.

**MODULE-1:** What Is a Security Metric? Metric and Measurement, Security Metrics Today, The Dissatisfying State of Security Metrics, Reassessing Our Ideas About Security Metrics. Designing Effective Security Metrics: Choosing Good Metrics, GQM for Better Security Metrics, More Security Uses for GQM, Summary.

**MODULE-2:** Understanding Data: What Are Data? Data Sources for Security Metrics; We Have Metrics and Data -Now what, Summary, Case Study 1. The Security Process Management Framework: Managing Security as a Business Process, the SPM Framework, Before You Begin SPM, Summary. The Analyzing Security Metrics Data: The Most Important Step, Analysis Tools and Techniques, Summary. Designing the Security Measurement Project: Before the Project Begins, Phase One: Build a Project Plan and Assemble the Team, Phase two: Gather the Metrics Data, phase Three: Analyze the Metrics Data and Build Conclusions, phase Four: Present Results, Phase Five: Reuse the Results, Project Management Tools, Summary.

**MODULE-3:** Measurements Security Operations: Sample Metrics for Security Operations, Sample Measurement Project for Security Operations, Summary. Measuring Compliance and Conformance: The Challenges of Measuring Compliance, Sample Measurement Projects for Compliance and Conformance, Summary.

**MODULE-4**: Measuring Security Cost and Value: Sample Measurement Projects for Compliance and Conformance, The Importance of Data to Measuring Cost and Value, Summary. Measuring People, Organizations, and Culture: Sample Measurement Projects for People, Organizations, and Culture, Summary.

**MODULE-5:** The Security Improvement Program: Moving from Projects to Programs, Managing Security Measurement with a Security, Requirements for a SIP, Measuring the SIP, Summary. Learning Security: Different Contexts for Security Process Management: Organizational Learning, Three Learning Styles for IT Security Metrics, Final Thoughts, Summary.

**TEXTBOOKS:**

1. IT SECURITY METRICS, Lance Hayden, TATA McGraw-HILL.

2. SECURITY METRICS, CAROLINE WONG, TATA McGraw-HILL

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| **O- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **INTERNET TECHNOLOGIES AND SERVICES** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Objective:**

The student who has knowledge of programming with java should be able to develop web based solutions using multi-tier architecture. S/he should have good understanding of different technologies on client and server side components as Follows:

Client Side: HTML5, CSS3, Javascript, Ajax, JQuery and JSON

Server Side: Servlets, JSP

Database: MySQL with Hibernate and Connection Pooling

Framework: Struts with validation framework, Internationalization (I18N)

SOA: Service Oriented Architecture, Web services fundamentals, Axis framework for WS

**MODULE I:** Client Side Technologies: Overview of HTML - Common tags, XHTML, capabilities of HTML5 Cascading Style sheets, CSS3 enhancements, linking to HTML Pages, Classes in CSS Introduction to JavaScripts, variables, arrays, methods and string manipulation, BOM/DOM (Browser/Document Object Model), accessing elements by ID, Objects in JavaScript Dynamic HTML with JavaScript and with CSS, form validation with JavaScript, Handling Timer Events Simplifying scripting with JQuery, JASON for Information exchange.

**MODULE II:** Introduction to Java Servlets: Introduction to Servlets: Lifecycle of a Servlet, Reading request and initialization parameters, Writing output to response, MIME types in response, Session Tracking: Using Cookies and Sessions Steps involved in Deploying an application Database Access with JDBC and Connection Pooling Introduction to XML, XML Parsing with DOM and SAX Parsers in Java Ajax - Ajax programming with JSP/Servlets, creating XML Http Object for various browsers, Sending request, Processing response data and displaying it. Introduction to Hibernate

**MODULE III:** Introduction to JSP: JSP Application Development: Types of JSP Constructs (Directives, Declarations, Expressions, Code Snippets), Generating Dynamic Content, Exception Handling, Implicit JSP Objects, 30 SCHOOL OF IT,JNT UNIVERSITY HYDERABAD-500085 : : REGULATIONS,COURSE STRUCTURE & SYLLABUS FOR M.TECH(CNIS) W.E.F 2019-20 Conditional Processing, Sharing Data Between JSP pages, Sharing Session and Application Data, Using

user defined classes with jsp:useBean tag, Accessing a Database from a JSP.

**MODULE IV:** Introduction to Struts Framework: Introduction to MVC architecture, Anatomy of a simple struts2 application, struts configuration file, Presentation layer with JSP, JSP bean, html and logic tag libraries, Struts Controller class, Using form data in Actions, Page Forwarding, validation frame work, Internationalization

**MODULE V :**Service Oriented Architecture and Web Services Overview of Service Oriented Architecture – SOA concepts, Key Service Characteristics, Technical Benefits of a SOA Introduction to Web Services– The definition of web services, basic operational model of web services, basic steps of implementing web services. Core fundamentals of SOAP – SOAP Message Structure, SOAP encoding, SOAP message exchange models, Describing Web Services –Web Services life cycle, anatomy of WSDL Introduction to Axis– Installing axis web service framework, deploying a java web service on axis. Web Services Interoperability – Creating java and .Net client applications for an Axis Web Service (Note: The Reference Platform for the course will be open source products Apache Tomcat Application Server, MySQL database, Hibernate and Axis) .

**TEXT BOOKS:**

1. Web Programming, building internet applications, Chris Bates 3rd edition, WILEY Dreamtech .

2. The complete Reference Java 7th Edition , Herbert Schildt., TMH.

3. Java Server Pages,Hans Bergsten, SPD, O’Reilly.

4. Professional Jakarta Struts - James Goodwill, Richard Hightower, Wrox Publishers.

5. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India, rp – 2008.

6. Understanding SOA with Web Services, Eric Newcomer and Greg Lomow, Pearson Edition – 2009

7. Java Web Service Architecture, James McGovern, Sameer Tyagi et al., Elsevier – 2009

**REFERENCES:**

1. Programming the world wide web,4th edition,R.W.Sebesta,Pearson

2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES , Marty Hall and Larry Brown Pearson

3. Internet and World Wide Web – How to program , Dietel and Nieto PHI/Pearson.

4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O’Reilly.

5. Professional Java Server Programming,S.Allamaraju & othersApress(dreamtech).

6. Java Server Programming ,Ivan Bayross and others, The X Team,SPD

7. Web Warrior Guide to Web Programmming-Bai/Ekedaw-Cengage Learning.

8.BeginningWebProgramming-JonDuckett,WROX.

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **CLOUD COMPUTING** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Objectives:**

Cloud computing has evolved as a very important computing model, which enables information, software, and shared resources to be provisioned over the network as services in an on-demand manner.

This course provides an insight into what is cloud computing and the various services cloud is capable.

**MODULE I:** Computing Paradigms, High-Performance Computing, Parallel Computing.Distributed Computing.ClusterComputing.Grid Computing, Cloud Computing., Biocomputing, Mobile Computing.QuantumComputing, Optical Computing. Nanocomputing.

**MODULE II:** Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics...Four Cloud Deployment Models .

**MODULE III:** Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

**MODULE IV:** Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS.Suitability of IaaS,Pros and Cons of IaaS,Summary of IaaS Providers,Platform as a Service,Characteristics of PaaS,Suitability of PaaS,Pros and Cons of PaaS,Summary of PaaS Providers,Software as a Service,Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS,Summary of SaaS Providers.Other Cloud Service Models.

**MODULE V:** Cloud Service Providers:EMC,EMC IT,Captiva Cloud Toolkit,Google,Cloud Platform,Cloud Storage,Google Cloud Connect,Google Cloud Print,Google App Engine,Amazon Web Services,Amazon Elastic Compute Cloud,Amazon Simple Storage Service,Amazon Simple Queue ,service,Microsoft,Windows Azure,Microsoft Assessment and Planning Toolkit,SharePoint,IBM,Cloud Models,IBM SmartCloud,SAP Labs,SAP HANA Cloud 92 SCHOOL OF IT,JNT UNIVERSITY HYDERABAD-500085 : : REGULATIONS,COURSE STRUCTURE & SYLLABUS FOR M.TECH(CNIS) W.E.F 2019-20 Platform,Virtualization Services Provided by SAP,Salesforce,Sales Cloud,Service Cloud: Knowledge as a Service,Rackspace,VMware,Manjrasoft,Aneka Platform.

**TEXTBOOKS:**

1. Essentials of cloud Computing: K.Chandrasekhran , CRC press, 2014

**REFERENCES:**

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.

2. Distributed and Cloud Computing, Kai Hwang, Geoffery C.Fox, Jack J.Dongarra, Elsevier, 2012.

3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, ShahedLatif,O’Reilly,SPD,rp2011

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **SOFTWARE QUALITY ASSURANCE AND TESTING** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Objectives:**

The student should be able to:

To understand software testing and quality assurance as a fundamental component of software life cycle.

To define the scope of SW T&QA projects To efficiently perform T&QA activities using modern software tools To estimate cost of a T&QA project and manage budgets .

To prepare test plans and schedules for a T&QA project.

To develop T&QA project staffing requirements .

To effectively manage a T&QA project.

**MODULE I:** Software Quality Assurance and Standards: The Software Quality challenge, What is Software Quality, Software Quality factors, The components of Software Quality Assurance system, Software Quality Metrics, Costs of Software Quality, Quality Management Standards, Management and its role in Software Quality Assurance, SQA unit and other actors in SQA system. - (Chapters: 1-4, 21-23, 25, 26) of T3 Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma and other latest quality standards (Refer Internet and R11, R12, R13).

**MODULE II:** Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy Building Software Testing Process: Software Testing Guidelines, workbench concept, Customizing the Software Testing Process, Process Preparation checklist - (Chapters: 2,3) of T1 Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing -(Chapters: 4, 5, 6, 7, 8) of T2 .

**MODULE III :** Software Testing Tools: Selecting and Installing Software Testing tools – (Chapter 4) of T1. Automation and Testing Tools - (Chapter 15) of T2 Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus. (Refer Internet and R9, R10) 80 SCHOOL OF IT,JNT UNIVERSITY HYDERABAD-500085 : : REGULATIONS,COURSE STRUCTURE & SYLLABUS FOR M.TECH(CNIS) W.E.F 2019-20 .

**MODULE IV:** Testing Process Seven Step Testing Process – I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing. (Chapters 6, 7, 8, 9, 10) of T1 .

**MODULE V:** Seven Step Testing Process – II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems (Chapters 12, 13, 14, 15) of T1.

**TEXT BOOKS:**

1. Effective Methods for Software Testing, Third edition, William E. Perry, Wiley India, 2009 .

2. Software Testing – Principles and Practices, Naresh Chauhan, Oxford University Press, 2010.

3. Software Quality Assurance – From Theory to Implementation, Daniel Galin, Pearson Education, 2009.

**REFERENCES:**

1. Testing Computer Software, Cem Kaner, Jack Falk, Hung Quoc Nguyen, Wiley India, rp2012.

2. Software Testing – Principles, Techniques and Tools, M.G.Limaye, Tata McGraw-Hill, 2009.

3. Software Testing - A Craftsman’s approach, Paul C. Jorgensen, Third edition, Auerbach Publications, 2010.

4. Foundations of Software Testing, Aditya P. Mathur, Pearson Education, 2008.

5. Software Testing and Quality Assurance – Theory and Practice, Kshirasagar Naik, Priyadashi Tripathy, Wiley India, 2010.

6. Software Testing, Ron Patton, Second edition, Pearson Education, 2006.

7. Software Testing and Analysis – Process, Principles and Techniques, Mauro Pezze, Michal Young, Wiley India, 2008.

8. Software Testing Techniques, Boris Beizer, Second edition, Wiley India, 2006

9. Foundations of Software Testing, Dorothy Graham, et al., Cengage learning, 2007, rp 2010.

10. Software Testing - Effective Methods, Tools and Techniques, Renu Rajani, Pradeep Oak, Tata McGraw-Hill, rp2011.

11. Software Automation Testing Tools for Beginners, Rahul Shende, Shroff Publishers and Distributors, 2012.

12. Software Testing Tools, K.V.K.K. Prasad, Dream Tech Press, 2008.

13. Software Testing Concepts and Tools, Nageswara Rao Pusuluri, Dream Tech press, 2007.

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **NATURAL LANGUAGE PROCESSING** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Objectives:**

To acquire basic understanding of linguistic concepts and natural language complexity, variability.

To acquire basic understanding of machine learning techniques as applied to language.

To implement N-grams Models.

**MODULE I:** Introduction and Overview What is Natural Language Processing, hands-on demonstrations. Ambiguity and uncertainty in language. The Turing test. Regular Expressions Chomsky hierarchy, regular languages, and their limitations. Finite-state automata. Practical regular expressions for finding and counting language phenomena. A little morphology. Exploring a large corpus with regex tools. Programming in Python An introduction to programming in Python. Variables, numbers, strings, arrays, dictionaries, conditionals, iteration. The NLTK (Natural Language Toolkit) String Edit Distance and Alignment Key algorithmic tool: dynamic programming, a simple example, use in optimal alignment of sequences. String edit operations, edit distance, and examples of use in spelling correction, and machine translation.

**MODULE II:** Context Free Grammars Constituency, CFG definition, use and limitations. Chomsky Normal Form. Top-down parsing, bottom-up parsing, and the problems with each. The desirability of combining evidence from both directions Non-probabilistic Parsing Efficient CFG parsing with CYK, another dynamic programming algorithms. Early parser. Designing a little grammar, and parsing with it on some test data. Probability Introduction to probability theory Joint and conditional probability, marginals, independence, Bayes rule, combining evidence. Examples of applications in natural language. Information Theory The "Shannon game"--motivated by language! Entropy, cross entropy, information gain. Its application to some language phenomena.

**MODULE III:** Language modeling and Naive Bayes Probabilistic language modeling and its applications. Markov models. N-grams. Estimating the probability of a word, and smoothing. Generative models of language. Part of Speech Tagging and Hidden Markov Models, Viterbi Algorithm for Finding Most Likely HMM Path Dynamic programming with Hidden Markov Models, and its use for part-of-speech tagging, Chinese word segmentation, prosody, information extraction, etc. 130 SCHOOL OF IT,JNT UNIVERSITY HYDERABAD-500085 : : REGULATIONS,COURSE STRUCTURE & SYLLABUS FOR M.TECH(CNIS) W.E.F 2019-20.

**MODULE IV**: Probabilistic Context Free Grammars Weighted context free grammars. Weighted CYK. Pruning and beam search. Parsing with PCFGs A tree bank and what it takes to create one. The probabilistic version of CYK. Also: How do humans parse? Experiments with eye-tracking. Modern parsers. Maximum Entropy Classifiers The maximum entropy principle and its relation to maximum likelihood. Maximum entropy classifiers and their application to document classification, sentence segmentation, and other language tasks.

**MODULE V:** Maximum Entropy Markov Models & Conditional Random Fields Part-of-speech tagging, nounphrase segmentation and information extraction models that combine maximum entropy and finite-state machines. State-of-the-art models for NLP. Lexical Semantics Mathematics of Multinomial and Dirichlet distributions, Dirichlet as a smoothing All for multinomial’s Information Extraction & Reference Resolution- Various methods, including HMMs. Models of anaphora resolution. Machine learning methods for co reference.

**TEXT BOOKS:**

1. "Speech and Language Processing": Jurafsky and Martin, Prentice Hall

2. "Statistical Natural Language Processing"- Manning and Schutze, MIT Press

3. “Natural Language Understanding”. James Allen. The Benajmins/Cummings Publishing Company

**REFERENCES BOOKS:**

1. Cover, T. M. and J. A. Thomas: Elements of Information Theory. Wiley.

2. Charniak, E.: Statistical Language Learning. The MIT Press.

3. Jelinek, F.: Statistical Methods for Speech Recognition. The MIT Press.

4. Lutz and Ascher - "Learning Python", O'Reilly

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B. Tech.**  **VI Semester** | | |
| **Code: B0540** | **BLOCKCHAIN TECHNOLOGY** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Objectives:**

Familiarise the functional/operational aspects of cryptocurrency ECOSYSTEM.

Understand emerging abstract models for Blockchain Technology.

identify major research challenges and technical gaps existing between theory and practice in cryptocurrency domain .

**MODULE 1** :The consensus problem - Asynchronous Byzantine Agreement - AAP protocol and its analysis - Nakamoto Consensus on permission-less, nameless, peer-to-peer network - Abstract Models for BLOCKCHAIN - GARAY model - RLA Model - Proof of Work ( PoW) as random oracle - formal treatment of consistency, liveness and fairness - Proof of Stake ( PoS) based Chains - Hybrid models ( PoW + PoS) .

**MODULE 2:** cryptographic basics for cryptocurrency - a short overview of Hashing, signature schemes, encryption schemes and elliptic curve cryptography .

**MODULE 3 :** Bitcoin - Wallet - Blocks - Merkley Tree - hardness of mining - transaction verifiability - anonymity - forks - double spending - mathematical analysis of properties of Bitcoin.

**MODULE 4 :** Ethereum - Ethereum Virtual Machine ( EVM) - Wallets for Ethereum - Solidity - Smart Contracts - some attacks on smart contracts .

**MODULE 5:** (Trends and Topics) - Zero Knowledge proofs and protocols in Blockchain - Succinct non interactive argument for Knowledge ( SNARK) - pairing on Elliptic curves - Zcash .

**Text Books:**

* 1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016. (Free download available).

**Reference Books :**

1. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015 ( article available for free download) { curtain raiser kind of generic article, written by seasoned experts and pioneers}.

2. J.A.Garay et al, The bitcoin backbone protocol - analysis and applications EUROCRYPT 2015 LNCS VOl 9057, ( VOLII ), pp 281-310. ( Also available at eprint.iacr.org/2016/1048) . ( serious beginning of discussions related to formal models for bitcoin protocols).

3. R.Pass et al, Analysis of Blockchain protocol in Asynchronous networks , EUROCRYPT 2017, ( eprint.iacr.org/2016/454) . A significant progress and consolidation of several principles).

4. R.Pass et al, Fruitchain, a fair blockchain, PODC 2017 ( eprint.iacr.org/2016/916)

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| **CO- PO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | |
| **COs** | **Program Outcomes (POs)** | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** |
| **CO1** | 1 |  | 1 |  |  |  |
| **CO2** | 1 |  | 1 |  |  |  |
| **CO3** |  |  | 1 |  | 1 |  |
| **CO4** |  |  | 1 |  | 2 | 1 |
| **CO5** | 1 |  | 1 | 1 | 2 | 3 |

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| **Code:80H03** | **ENGLISHCOMMUNICATION ANDPRESENTATIONSKILLSLAB**  **(CommonforEEE,ECE,CSEandIT)** | **L** | **T** | **P** |
| **Credits:1** | **-** | **-** | **2** |

## Pre-requisites: NILCourseObjectives:

Thelearnersneedtobeawareofthecharacteristicsoftechnicalcommunicationintheirworkplaces;asaresult,theyareexposedtodifferentchannelsoftechnicalcommunication. Hence the acquired skills make the learners effective communicatorsusing persuasive language. Besides the above said, one of the major objectives is tomaintainobjectivityinwritingdocuments andtoproduceprofessionalqualitydocumentsusingdifferentcomponentsofthelanguage.

**Methodology:** Facilitator’s role: Since classroom learning augments thinking process,helpingthemtodevelop written,spokenandnonverbalcommunication,thefacilitator

/Facultywouldbrieflydiscussthetopicswiththestudentsandlateronguidethem

whilethestudentsinvolvedin activities,writingwork andwhilemakingpresentations.Thefacilitatorisrequiredtodesignalotofpractical/industryorientedprojectworksforthestudents

\*Studentsarerequiredtoparticipate,perform,writeandsubmittheworkintheformofwritten documents or Power Point Presentations to hone their spoken written and nonverbal communication skills. Students are to take up field work and submit the projectwork.

## MODULEI:OralPresentation

Mechanics of Presentations – Methodology of Presentation, Importance of Non-verbalcommunicationduringpresentations–NuancesofPresentation.

\*ThisparticularMODULEisforinternalevaluationpurpose(s).

## MODULEII: E-CorrespondenceandEmailetiquette

Common web mail services, yahoo, Gmailetc, fields to pay attention- To:, Cc:, Bcc:,Reply All, Subject, Salutation, Body, Signature, Font, Caps Lock , Highlight,The‘KISS’ strategy( Keep It Simple and Short,)Points to remember while signing off,IntroductiontoTechnicalVocabulary.

* ThisMODULEispurelyforinternalassessment/evaluation

## MODULEIII:GroupDiscussion

Initiators-Contributor-Informer-TeamLeader-Motivator-CreativeContributor,Importance of ,Non verbal communication -eye contact, voice characters, posture,gestures, do’s and don'ts, Role play and Simulation- Learners assuming the roles ofcharactersand participating in Group discussion, analysis, or prediction with strictlydefinedgoals.

## MODULEIV:InterviewSkills&OfficeEtiquette

Preparing for the interview, types of interviews, interview session, importance of nonverbalcommunicationduringtheinterview,do’sanddon'tsofinterview,followupandthanking letter. FAQ’s.Formal Conversation, office attire- do’s and don’ts, greetingsandmeetings,speakingtoseniors andhandshakes,offeringandtakingvisitingcards.

## MODULEV:JobHuntProcess

SWOTanalysis, correspondence and browsing the internet tosearch for a suitablejob(s), jobapplication-cover letterdrafting, drafting awinningresume’, types ofresume’s-electronic,videoandprintedresume’s

* Instruction: Students are required toprepare their video resume whichwill beassessedbythefacultymember.

## REFERENCES:

1. Chrissie:**HandbookofPracticalCommunication Skills**:JaicoPublishinghouse,1999.
2. Daniels, Aubrey:**Bringing OuttheBest inPeople**:TataMcGraw-Hill: NewYork,2003.
3. [Wright](http://www.amazon.in/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&field-author=Chrissie%2BWright&search-alias=stripbooks),Goulstone,Mark:**JustListen:DiscovertheSecrettogettingthroughtoabsolutelyanything**:AmericanManagementAssociation,2010.
4. Leslie.T.Giblin:**Skillwithpeople**Publicationdetailsnotknown
5. Lewis,Norman:**WordPowerMadeEasy**:GoyalPublications:New Delhi,2009.
6. Murthy,A.G,Krishna,:**TenMuch**:TataMcGraw-Hill:NewDelhi,2010.

## E-RESOURCES:

1. <http://www.mindtools.com/pages/article/newTMC_05.htm>
2. <http://www.kent.ac.uk/careers/intervw.htm>
3. <http://www.wikihow.com/Write-a-Report>

## Course Outcomes:

Attheendofthecourse,studentswillbe ableto

1. GiveOralPresentationsConfidently.
2. DraftappropriateResumeinaccordancewiththecontext.
3. Participateandpresenttheirviewandideaslogicallyandconfidently.
4. Understandthe importanceofcommunicationinvarioussettings.
5. Utilizethetechnologyforcareeradvancement.

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| **CO-POMapping**  **(3/2/1indicates strengthofcorrelation)3-Strong,2-Medium,1-Weak** | | | | | | | | | | | | |
| **COs** | **ProgrammeOutcomes(POs)** | | | | | | | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  | 1 |  |  |  |  | 2 |  | 2 |
| **CO2** |  |  |  |  |  |  |  |  |  | 1 |  | 2 |
| **CO3** |  | 1 |  | 1 |  |  |  |  |  | 2 |  | 2 |
| **CO4** |  |  |  |  | 1 | 1 |  |  | 1 | 2 |  | 2 |
| **CO5** |  |  |  | 1 | 1 |  |  |  | 1 | 2 |  | 2 |

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| **2021-22**  **Onwards(MR-21)** | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VISemester** | | |
| **Code:B0544** | **DATA MINING LAB** | **L** | **T** | **P** |
| **Credits:2** | **-** | **1** | **2** |

## Prerequisites: NIL

## Course Objectives:

This course provides the students to understand stages in building a Data Warehouse,identifytheneedandimportanceofpreprocessingtechniques,implementsimilarityanddissimilaritytechniques,analyzeandevaluateperformanceofalgorithmsforAssociationRules,analyzeClassificationandClusteringalgorithms.

**SoftwareRequirements:**WEKATOOL

## ListofPrograms:

1. Demonstrationofpreprocessingondatasetstudent.arff.
2. Implementationofpreprocessingondatasetlabor.arff.
3. DemonstrationofAssociationruleprocessondatasetcontactlenses.arffusingaprioriAlgorithm.
4. ImplementAssociationruleprocessondatasettest.arff usingapriorialgorithm.
5. Applyclassificationruleprocessondatasetstudent.arffusingj48algorithm.
6. Performclassificationruleprocess ondatasetemployee.arffusingj48algorithm.
7. Useclassificationruleprocessondatasetemployee.arffusingid3algorithm.
8. Deployclassificationruleprocessondatasetemployee.arff usingnaïvebayesAlgorithm.
9. Implementclusteringruleprocessondatasetiris.arff usingsimplek-means.
10. Makeuseofclusteringruleprocessondatasetstudent.arffusingsimplek-means.
11. Designadecisiontreebypruningthenodesonyourown.Convertthedecisiontreesinto “if- then-else rules”. The decision tree must consists of 2-3 levels and convertitintoasetofrules.
12. Generate Association rules for the following transactional database using Apriorialgorithm.

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| TID | ListofItems |
| T100 | I1,I2,I5 |
| T200 | I2,I4 |
| T300 | I2,I3 |
| T400 | I1,I2,I4 |
| T500 | I1,I3 |
| T600 | I2,I3 |
| T700 | I1,I3 |
| T800 | I1,I2,I3,I5 |

## TEXTBOOKS:

1. Pang-Ning Tan & Michael Steinbach, “**Introduction to Data Mining**”,VipinKumar,Pearson.
2. Jiawei Han, Michel Kamber ,”**Data Mining concepts and Techniques**”, 3/e,Elsevier.

## REFERENCES:

1. HongboDu,“**DataMiningTechniquesandApplications:AnIntroduction**”,CengageLearning.
2. VikramPudiandP.RadhaKrishna,“**DataMining**”,Oxford.
3. MohammedJ.Zaki,WagnerMeira,Jr,”**DataMiningandAnalysis-FundamentalConceptsandAlgorithms**”,Oxford
4. AlexBerson,StephenSmith,”**DataWarehousingDataMining&OLAP**”,TMH.

## Course Outcomes:

Attheendofthecourse,studentswillbe ableto

1. **Analyze**theclassificationrules onvarious databases.
2. **Deploy**associationrulesforanykindofdatabases.
3. **Develop** clusteringrulesforapplications.

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| **CO-PO,PSOMapping**  **(3/2/1indicatesstrengthofcorrelation)3-Strong,2-Medium,1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **ProgrammeOutcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 1 | 1 | 1 |
| **CO2** | 1 | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  | 2 |  | 2 |
| **CO3** | 1 | 2 | 3 | 2 | 1 |  |  |  |  |  |  |  | 1 |  | 2 |

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| **2021-22**  **Onwards(MR-21)** | **MALLAREDDYENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VISemester** | | |
| **Code:B6211** | **ETHICAL HACKING LAB** | **L** | **T** | **P** |
| **Credits:1.5** | **-** | **-** | **2** |

**Course Objectives:**

* The aim of the course is to introduce the methodologies and framework of ethical hacking for enhancing the security.
* The course includes-Impacts of Hacking; Types of Hackers; Information Security Models; Information Security Program; Business Perspective; Planning a Controlled Attack; Framework of Steps (Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Deliverable and Integration)

#### List Of Experiment:

1. Setup a honey pot and monitor the honey pot on network
2. Write a script or code to demonstrate SQL injection attacks
3. Create a social networking website login page using phishing techniques
4. Write a code to demonstrate DoS attacks
5. Install rootkits and study variety of options
6. Study of Techniques uses for Web Based Password Capturing.
7. Install jcrypt tool (or any other equivalent) and demonstrate Asymmetric, Symmetric Crypto algorithm, Hash and Digital/PKI signatures studied in theory Network Security And Management
8. Implement Passive scanning, active scanning, session hizaking, cookies extraction using Burp suit tool

#### Course Outcomes:

1. Gain the knowledge of the use and availability of tools to support an ethical hack
2. Gain the knowledge of interpreting the results of a controlled attack

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| **CO-PO,PSOMapping**  **(3/2/1indicatesstrengthofcorrelation)3-Strong,2-Medium,1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **ProgrammeOutcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 1 | 1 | 1 |
| **CO2** | 1 | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  | 2 |  | 2 |
| **CO3** | 1 | 2 | 3 | 2 | 1 |  |  |  |  |  |  |  | 1 |  | 2 |

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| **2021-22**  **Onwards**  **(MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VII Semester** | | |
| **Code: B6215** | **Digital Forensics** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

**Course Objectives:**

**•**To learn the concepts of the rapidly changing and fascinating field of computer forensics

•To be familiar with the technical expertise and the knowledge required to investigate, detect, and prevent digital crimes

•To identify the approaches on digital forensics legislations, digital crime, forensics processes and procedures

•To understand perceptions of E-evidence collection, preservation, network forensics, art of steganography and mobile device forensics

# MODULE –I:

**Digital Forensics Science:** Forensics science, computer forensics, and digital forensics.

**Computer Crime:** Criminalistics as itrelates to the investigative process, analysis of cyber criminalistics area, holistic approach to cyber-forensics

# MODULE –II:

**Cyber Crime Scene Analysis:** Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation

# MODULE –III:

**Evidence Management & Presentation:** Create and manage shared folders using operating system, importance of the forensic mindset, define the workload of law enforcement, explain what the normal case would look like, define who should be notified of a crime ,parts of gathering evidence, Define and apply probable cause.

# MODULE –IV:

**Computer Forensics:** Prepare a case, begin an investigation, understand computer forensics, workstations and software, Conduct an investigation, Complete a case, Critique a case

# MODULE –V:

**Network Forensics:** open-source security tools for network forensic analysis, Recent trends in mobile forensic technique and methods to search and seizure electronic evidence requirements for preservation of network data.

**Legal Aspects of Digital Forensics:** ITAct2000,amendment of ITAct 2008.

# TEXT BOOK:

1. The Basics of Digital Forensics, John Sammons, Elsevier
2. ComputerForensics:ComputerCrimeSceneInvestigation,JohnVacca,LaxmiPublications

# REFERENCES:

1. Learn Computer Forensics: A Beginner's Guide to Searching, Analyzing, and Securing Digital Evidence, William Oettinger, 1stEdition, Packt Publishing, 2020,ISBN:1838648178
2. Cybercrime and Digital Forensics :An Introduction, Thomas J.Holt, Adam M. Bossler, Kathryn C. Seigfried – Spellar, Routledge

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| **2021-22**  **Onwards**  **(MR21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VII Semester** | | |
| **Code: B0551** | **MACHINE LEARNING** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

## prerequisites: NIL

**Course Objectives:**

This course provides the students a broad introduction to python programming, machine learning, discuss about various learning algorithms like decision tree learning, Bayesian learning, computational learning, instance based learning, combined inductive and analytical learning methods, analyze genetic algorithms and various learning set of rules.

## Module I: Python programming -Machine Learning (ML) [10 Periods]

## Introduction to Python:

Python, expression, variables, assignment statements, functions, built in function, strings, modules, lists, making choice( Boolean, if, storing conditional statements), repetition(loops, while, counted loops, user input loops, control loops , style notes), File processing( one record per line, records with multiple fields, positional data, multiline records, looking ahead, writing files), sets and dictionaries( sets, dictionaries, inverting a dictionary), Algorithms with suitable example. Construction of functions, methods, Graphical user interfaces, databases and applications.

**Introduction -** Well-posed learning problems, designing a learning system, Perspectives and issues in ML

**Concept Learning -** Introduction, Concept Learning task, Concept learning as search, Find- S: Finding a maximally specific hypothesis, Version spaces and candidate elimination algorithm, Remarks on version spaces and Candidate elimination, Inductive bias.

**Module II: Decision Tree Learning and ANN [09 Periods]**

**Decision Tree learning -** Introduction, Decision Tree representation, Appropriate Problems, Decision Tree learning algorithm, Hypothesis Space Search, Inductive bias, Issues.

**Artificial Neural Networks -** Introduction, Neural network representation, Problems for Neural Network Learning, Perceptions, Multilayer networks and Back Propagation algorithm, Remarks on back propagation algorithm, Evaluation Hypotheses, Motivation, Estimation hypothesis accuracy, Sampling theory, General approach for deriving confidence intervals, Difference in error of two hypotheses,

**Module III: Bayesian learning and Instance based Learning [10 Periods]**

**A: Bayesian learning -** Introduction and concept learning, Maximum Likelihood and Least Squared Error Hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle.

**B: Instance-based Learning -** K -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Lazy and Eager Learning, Genetic Algorithm: Motivation, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

**Module IV: Rules and Analytical Learning [09 Periods]**

**Learning Sets of Rules -** Introduction, Sequential Covering Algorithms, Learning Rule Sets: Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution.

**Analytical Learning -** Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

**Module V: Learning Techniques [10 Periods]**

**Combining Inductive and Analytical Learning -** Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to initialize Hypothesis, Using Prior Knowledge to alter Search Objective, Using Prior Knowledge to Augment Search Operators.

**Reinforcement Learning -** Introduction, Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

## TEXT BOOKS:

1. Jennifer Campbell paulGries Jason Montojo Greg Wilson, "Practical Programming" An introduction to Computer Science Using Python
2. Tom M. Mitchell, ―**Machine Learning**‖, MGH, 1st Edition, 2013.
3. Stephen Marsland, ―**Machine Learning: An Algorithmic Perspective**‖, Chapman and Hall / CRC, 2nd Edition, 2014.

## REFERENCES:

1. Neural Networks,William WHsieh, ― **Machine Learning Methods in the Environmental Sciences**‖
2. Richard O. Duda, Peter E. Hart and David G. Stork, ―**Pattern Classification**‖, John Wiley & Sons Inc., 2001
3. Chris Bishop, ―**Neural Networks for Pattern Recognition**‖, Oxford University Press, 1995

## E-RESOURCES:

1. <http://www.zuj.edu.jo/download/machine-learning-tom-mitchell-pdf/>
2. https://goo.gl/FKioSh
3. <http://www.ntu.edu.sg/home/egbhuang/pdf/ieee-is-elm.pdf>
4. [www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-](http://www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-) summarization.pdf
5. <http://nptel.ac.in/courses/106106139/>
6. <http://nptel.ac.in/courses/106105152/>

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| **2021-22**  **Onwards (MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VII Semester** | | |
| **Code: B6217** | **CYBER SECURITY** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

# Prerequisites: NIL Course Objectives:

* This course makes the students to understand the concept of cyber security and issues and challenges associated with it, the cybercrimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.
* The course includes the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of social media platforms, the basic concepts related to E-commerce and digital payments, the basic security aspects related to computer and mobiles.

# MODULE-I: Introduction to Cyber Security [9 Periods]

Hacking, Types of hacking, Myths about hacking, Types of hackers, Motives for Hacking, Ethical hacking, Concept of cyber security, Issues and challenges of cyber security, Cyberterrorism, Cyber forensics, The INDIAN cyberspace, Regulation of cyberspace, National cyber security policy, Communication technology, Internet, World wide web, Advantages and Disadvantages of the Internet, Internet infrastructure for data transfer and governance, Internet society, Recent cyber-attacks and Data breaches in India.

# MODULE-II: Cyber Crime and Cyber Law [10 Periods]

Cybercrime, Classification of cybercrimes, Common cybercrimes- cybercrime targeting computers and mobiles, cybercrime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus- operandi, Reporting of cybercrimes, Remedial and mitigation measures, Legal perspective of cybercrime, IT Act 2000 and its amendments, Cybercrime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies.

# MODULE-III: Social Media Overview and Security [10 Periods]

Introduction to Social networks, Types of social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of social media, Case studies.

# MODULE-IV: E-Commerce and Digital Payments [10 Periods]

Definition of E- Commerce, Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices, Introduction to digital payments, Components of digital payment and stake holders, Modes of digital payments- Banking Cards, Unified Payment Interface (UPI), e-Wallets, Unstructured Supplementary Service Data (USSD), Aadhar enabled Payment Systems (AePS), Digital payments related common frauds and preventive measures, RBI guidelines on digital payments and customer protection in unauthorized banking transactions, Relevant provisions of Payment Settlement Act,2007.

# MODULE-V: Digital Devices Security, Tools and Technologies for Cyber Security [9 Periods]

End Point device and Mobile phone security, Password policy, Security patch management, Data backup, Downloading and management of third-party software, Device security policy, Cyber Security best practices, Significance of host firewall and Ant-virus, Management of host firewall and Anti-virus, Wi-Fi security, Configuration of basic security policy and permissions, Cyber safety tips.

# TEXT BOOKS

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011).

# REFERENCE BOOKS

1. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry

A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)

1. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.

# Course Outcomes:

At the end of the course, students will be able to:

1. **Explore** various concepts of cyber security and issues.
2. **Investigate** more on various challenges associated with cyber security.
3. **Analyze** reporting procedure of inappropriate content.
4. **Review** underlying legal aspects and best practices for the use of social media platforms.
5. **Examine** various basic concepts related to E-commerce and digital payments.

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| **CO - PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes (POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 |  | 1 | 3 |  |  |  |  |  |  |  | 3 |  | 3 |  |
| **CO2** |  | 2 | 2 |  | 2 |  |  |  |  |  |  |  | 2 |  |  |
| **CO3** | 2 | 3 |  | 1 | 1 |  |  |  |  |  |  |  | 2 | 3 |  |
| **CO4** |  | 3 | 3 |  |  |  |  |  |  |  |  | 1 | 3 | 2 |  |
| **CO5** | 3 |  | 2 | 3 | 3 |  |  |  |  |  |  | 2 |  | 1 |  |

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| **2021-22**  **Onwards**  **(MR21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech VII Sem** | | |
| **Code:** B**6219** | **Open Elective-II**  **Software Project Management** | **L** | **T** | **P** |
| **Credits: 3** | **3** | **-** | **-** |

***Course Objectives & Outcomes***

The objectives of the course are:

1. To study how to plan and manage projects at each stage of the software development life cycle (SDLC)
2. To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process.
3. To understand successful software projects that support  organization's strategic goals

***Course Outcomes***

After completing this Course, the student should be able to:

1. To match organizational needs to the most effective software development model
2. To understand the basic concepts and issues of software project management
3. To effectively Planning the software projects
4. To implement the project plans through managing people, communications and change
5. To select and employ mechanisms for tracking the software projects
6. To conduct activities necessary to successfully complete and close the Software projects
7. To develop the skills for tracking and controlling software deliverables
8. To create project plans that address real-world management challenges

**MODULE I:** Introduction

Project, Management, Software Project Management activities, Challenges in software projects, Stakeholders, Objectives & goals

Project Planning: Step-wise planning, Project Scope, Project Products & deliverables, Project activities, Effort estimation, Infrastructure

**MODULE II:** Project Approach

Lifecycle models, Choosing Technology, Protoyping

Iterative & incremental Process Framework: Lifecycle phases, Process Artifacts, Process workflows (Book 2)

**MODULE III:** Effort estimation & activity Planning

Estimation techniques, Function Point analysis, SLOC, COCOMO, Use case-based estimation , Activity Identification Approaches, Network planning models, Critical path analysis

**MODULE IV:** Risk Management

Risk categories, Identification, Assessment, Planning and management, PERT technique, Monte Carlo approach

**MODULE V:** Project Monitoring &Control , Resource Allocation

Creating a framework for monitoring & control, Progress monitoring, Cost monitoring, Earned value Analysis, Defects Tracking, Issues Tracking, Status reports, Types of Resources, Identifying resource requirements, Resource scheduling

**MODULE VI:** Software Quality

Planning Quality, Defining Quality - ISO 9016, Quality Measures, Quantitative Quality Management Planning, Product Quality & Process Quality

Metrics, Statistical Process Control Capability Maturity Model, Enhancing software Quality ( Book3)

Text Books:

1. Software Project Management, Bob Hughes & Mike Cotterell, TATA Mcgraw-Hill
2. Software Project Management, Walker Royce: Pearson Education, 2005.
3. Software Project Management in practice, PankajJalote, Pearson.

Reference Book:

1. Software Project Management, Joel Henry, Pearson Education.

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | 1 | 1 | 1 |  | 1 |  |  |  |  |  | 1 | 1 | 2 | 1 |
| **CO2** | 1 | 2 | 1 | 2 | 1 |  |  |  |  |  |  | 1 | 1 | 2 |  |
| **CO3** | 1 | 3 | 2 | 2 | 1 | 1 |  |  |  |  |  | 2 | 1 | 2 | 1 |
| **CO4** | 1 | 3 | 3 | 3 | 1 | 2 |  |  |  |  |  | 3 | 2 | 2 | 1 |
| **CO5** | 1 | 3 | 3 | 3 | 1 | 2 |  |  |  |  |  | 3 | 2 | 3 | 1 |

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| **2021-22**  **Onwards**  **(MR-21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VII Semester** | | |
| **Code: B6215** | **DIGITAL FORENSICSLAB** | **L** | **T** | **P** |
| **Credits: 2** | **-** | **-** | **2** |

**COURSEOBJECTIVES:**

* To learn the concepts of the rapidly changing and fascinating field of computer forensics
* To be familiar with the technical expertise and the knowledge required to investigate, detect, and prevent digital crimes
* To identify the approaches on digital forensics legislations, digital crime, forensics processes and procedures
* To understand perceptions of E-evidence collection, preservation, network

forensics, art of steganography and mobile device forensics

**List of experiments**:

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| 1 | Study of Computer Forensics and different tools used for forensic investigation |  |
| 2 | How to Recover Deleted Files using Forensics Tools |  |
| 3 | Study the steps for hiding and extract any text file behind an image file/ Audio file using Command Prompt. |  |
| 4 | How to Extract Exchange able image file format (EXIF) Data from Image Files using Exit reader Software |  |
| 5 | How to make the forensic image of the hard drive using En Case Forensics. |  |
| 6 | How to Restoring the Evidence Image using En Case Forensics |  |
| 7 | How to Collect Email Evidence in Victim PC |  |
| 8 | How to Extracting Browser Artifacts |  |
| 9 | How to View Last Activity of Your PC |  |
| 10 | Find Last Connected US Bon your system (USB Forensics) |  |
| 11 | Comparison of two Files for forensics investigation by Compare IT software |  |
| 12 | Live Forensics Case Investigation using Autopsy |  |

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| **CO- PO, PSO Mapping**  **(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak** | | | | | | | | | | | | | | | |
| **COs** | **Programme Outcomes(POs)** | | | | | | | | | | | | **PSOs** | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 3 | 3 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO2** | 3 | 2 |  |  |  |  |  |  |  |  |  | 2 | 2 |  |  |
| **CO3** | 2 | 3 |  |  |  |  |  |  |  |  |  | 2 |  | 2 |  |
| **CO4** | 3 | 2 |  |  |  |  |  | 2 |  |  |  | 2 |  | 2 |  |

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| **2021-22**  **Onwards (MR21)** | **MALLA REDDY ENGINEERING COLLEGE**  **(Autonomous)** | **B.Tech.**  **VII Semester** | | |
| **Code: B0560** | **Machine Learning Lab** | **L** | **T** | **P** |
| **Credits: 2** | **-** | **1** | **2** |

**Prerequisites**: Computer Programming, Python

**Course Objective:** The objective of this lab is to get an overview of the various machine learning techniques and can able to demonstrate them using python.

**Course Outcomes:** After the completion of the course the student can able to:

* understand complexity of Machine Learning algorithms and their limitations;
* understand modern notions in data analysis-oriented computing;
* be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
* Be capable of performing experiments in Machine Learning using real-world data

**Software Requirement: Python**

**List of Programs**

**1.** The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye‘s rule in python to get the result. (Ans: 15%)

**2.** Extract the data from database using python

**3.** Implement k-nearest neighbors classification using python

**4.** Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the result of k means clustering with 3 means (i.e., 3 centroids) VAR1 VAR2 CLASS 1.713 1.586 0 0.180 1.786 1 0.353 1.240 1 0.940 1.566 0 1.486 0.759 1 1.266 1.106 0 1.540 0.419 1 0.459 1.799 1 0.773 0.186 1

**5.** The following training examples map descriptions of individuals onto high, medium and low credit-worthiness.

medium skiing design single twenties no -> high Risk

high golf trading married forties yes -> low Risk

low speedway transport married thirties yes -> med Risk

medium football banking single thirties yes -> low Risk

high flying media married fifties yes -> high Risk

low football security single twenties no -> med Risk

medium golf media single thirties yes -> med Risk

medium golf transport married forties yes -> low Risk

high skiing banking single thirties yes -> high Risk

low golf unemployed married forties yes -> high Risk

Input attributes are (from left to right) income, recreation, job, status, age-group, home owner. Find the unconditional probability of `golf' and the conditional probability of `single' given `med Risk' in the dataset?

**6.** Implement linear regression using python.

**7.** Implement the multivariate linear regression.

**8.** Implement simple logistic regression and multivariate logistics regression.

**9.** Implement Naïve Bayes theorem to classify the English text

**10.** Implement an algorithm to demonstrate the significance of genetic algorithm

**11.** Implement the finite words classification system using Back-propagation algorithm

**12.** Implement anomaly detection and recommendation.

**REFERENCES:**

**1.** Willi Richert, Luis Pedro Coelho, ―Building Machine Learning with Python‖, **Packt** Publishing, 2013.