



**M.Sc**

**Software Technology  
Curriculum and Syllabus**

**Effective from the Academic year**

**2019 – 2020**

**Department of Computer Applications**

**School of Computing Sciences**

## PROGRAM EDUCATIONAL OBJECTIVES(PEO)

- PEO1: Exhibit practical hands on experience on the core and fundamentals like System Software Concepts, Mobile Computing and Application Development, Network Security, Relational Database Systems, Web Technology.
- PEO2: Display practical knowledge, identify and find solutions on research problems related to the latest trends in software technology such as Advanced Java Programming, Data Exploration using Python, .Net Framework and Architecture etc.
- PEO3: Be technology-oriented with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of computer systems and technology on people and society
- PEO4: Be familiar with current research within various fields of Software Technology and to Know the recent developments of IT, future possibilities and limitations, and understand the value of lifelong learning
- PEO5: Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

## PROGRAM OUTCOME (PO)

- PO1: **Engineering knowledge:** Apply the knowledge of science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2: **Problem analysis:** An ability to analyze a problem, and identify and employ in the IT requirements appropriate to its solution
- PO3: **Design/development of solutions:** An ability to design, implement, and evaluate an IT based system, process, component, or program or a Mobile Application to meet desired needs.
- PO4: **Conduct investigations of complex problems:** An ability to effectively integrate IT-based solutions into the user environment. An understanding of best practices and standards and their application
- PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6: **The engineer and society:** An ability to use current techniques, skills, and tools necessary for computing practice. An ability to use and apply current technical concepts and practices in the core information technologies
- PO7: **Communication:** Communicate effectively on complex activities with the scientific community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

## **PROGRAMME SPECIFIC OUTCOME(PSO)**

- PSO1: Communicate software technology concepts, designs, and solutions effectively and professionally. Apply knowledge of computing to produce effective designs and solutions for specific problems.
- PSO2: Use software development tools, software systems, and modern computing platforms. Understand how technological advances impact society and the social, legal, ethical and cultural ramifications of computer technology and their usage.
- PSO3: Discuss the advancements in the specialized communication technologies such as Mobile Computing, Cloud Computing, Software Management and Quality Assurance, Networking and Database Management Systems.
- PSO4: Be familiar in the applications areas like Python, JAVA Programming, .Net Framework, Relational Database Management etc. by allowing the students choose electives in accordance with their areas of interest.
- PSO5: Get industrial exposure through the 6 months Industrial Internship in IT industry. To make them employable according to current demand of IT Industry.

**BOARD OF STUDIES**

|    |                               |  |                 |
|----|-------------------------------|--|-----------------|
| 1. | Dr. P. SWAMINATHAN            | DEAN, School of<br>Computing Sciences  | Chairman        |
| 2. | Dr.P.MAYILVAHANAN             | Professor, Department<br>Of Computer<br>Applications   | Internal Member |
| 3. | Dr. S. PRASANNA               | Professor and HEAD,<br>Department of<br>Computer Applications                                    | Internal Member |
| 4. | Dr. T. KAMALAKANNAN           | Professor and<br>HEAD,<br>Department of IT.  | Internal Member |
| 5. | Dr. K. KALAISELVI             | Professor and HEAD,<br>Department of<br>Computer Science.  | Internal Member |
| 6. | Dr. K.R. ANANTH<br>PADMANABAN | Professor & HEAD,<br>Department of Computer<br>Science, SRM Arts and<br>Science College, Chennai | External Member |
| 7. | Dr. P. MAGESH KUMAR           | Calibsoft Technologies Pvt<br>Ltd.,<br>Chennai.  | Industry Member |
| 8. | Mr.R. BALAMURUGAN,            | SCOPUS Ltd., Chennai   | Alumni Member   |

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES**

**(VISTAS) M.SC SOFTWARE TECHNOLOGY**

**COURSES OF STUDY AND SCHEME OF ASSESSMENT**

**(TOTAL NO OF CREDITS:96)**

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|                   |           | Hours/Week   |                                       |        |         |       |    |    |    |     |
|-------------------|-----------|--------------|---------------------------------------|--------|---------|-------|----|----|----|-----|
|                   |           | MaximumMarks | CodeNo.                               | Course | Lecture |       |    |    |    |     |
| Tutorial          | Practical | Credits      | CA                                    |        | SEE     | Total |    |    |    |     |
| <b>SEMESTER I</b> |           |              |                                       |        |         |       |    |    |    |     |
| CORE              |           |              | System Software Concepts              | 4      | 0       | 0     | 4  | 40 | 60 | 100 |
| CORE              |           |              | Programming in Java                   | 5      | 0       | 0     | 5  | 40 | 60 | 100 |
| CORE              |           |              | Relational Database Systems           | 4      | 0       | 0     | 4  | 40 | 60 | 100 |
| CORE              |           |              | Web Technology                        | 3      | 0       | 0     | 3  | 40 | 60 | 100 |
| CORE              |           |              | Practical –I Java Programming         | 0      | 0       | 6     | 3  | 40 | 60 | 100 |
| CORE              |           |              | Practical – II Web Technology & RDBMS | 0      | 0       | 6     | 3  | 40 | 60 | 100 |
| GE                |           |              | Soft Skill- I                         | 2      | 0       | 0     | 2  |    |    |     |
|                   |           |              |                                       | 18     | 0       | 12    | 24 |    |    |     |

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(VISTAS) M.SC SOFTWARE TECHNOLOGY**

**COURSES OF STUDY AND SCHEME OF ASSESSMENT**

**(TOTAL NO OF CREDITS:96)**

|                                  |                   | Hours/Week   |                 |   |    |         |    |     |       |  |
|----------------------------------|-------------------|--|-----------------|---|----|---------|----|-----|-------|--|
| Tutorial                         | Practical Credits | Maximum Marks  | Code No. Course |   |    | Lecture |    | SEE | Total |  |
|                                  |                   |  | CA              |   |    |         |    |     |       |  |
| <b>SEMESTER 2</b>                |                   |  |                 |   |    |         |    |     |       |  |
| CORE                             |                   | Advanced JAVA Programming  | 5               | 0 | 0  | 5       | 40 | 60  | 100   |  |
| CORE                             |                   | Mobile Computing and Application Development                       | 4               | 0 | 0  | 4       | 40 | 60  | 100   |  |
| CORE                             |                   | Network Security   | 4               | 0 | 0  | 4       | 40 | 60  | 100   |  |
| <b>Business Analytics Stream</b> |                   |  |                 |   |    |         |    |     |       |  |
| DSE                              |                   | Discipline Specific Elective -I                                    | 4               | 0 | 0  | 4       | 40 | 60  | 100   |  |
| DSE                              |                   | Discipline Specific Elective-II                                    | 4               | 0 | 4  | 4       | 40 | 60  | 100   |  |
| <b>Social Computing Stream</b>   |                   |  |                 |   |    |         |    |     |       |  |
| DSE                              |                   | Discipline Specific Elective - I                                   | 4               | 0 | 0  | 4       | 40 | 60  | 100   |  |
| DSE                              |                   | Discipline Specific Elective – II                                  | 4               | 0 | 0  | 4       | 40 | 60  | 100   |  |
| CORE                             |                   | Practical III – Advanced Java & Mobile Application Development     | 0               | 0 | 4  | 2       | 40 | 60  | 100   |  |
| CORE                             |                   | Practical IV – Social Computing Lab/ Data Exploration using Python | 0               | 0 | 4  | 2       | 40 | 60  | 100   |  |
| GE                               |                   | Generic Elective   | 2               | 0 | 0  | 2       |    |     |       |  |
|                                  |                   |  | 23              | 0 | 12 | 27      |    |     |       |  |

CA - Continuous

AssessmentSEE -

SemesterEndExamination

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES  
(VISTAS) M.SC SOFTWARE TECHNOLOGY**

**COURSES OF STUDY AND SCHEME OF ASSESSMENT**

**(TOTAL NO OF CREDITS:96)**

|                                  |   | Hours/Week                 |    |    |     |         |    |     |  |
|----------------------------------|---|----------------------------|----|----|-----|---------|----|-----|--|
|                                  |   | MaximumMarksCodeNo. Course |    |    |     | Lecture |    |     |  |
| Tutorial                         | Practical   | Credits                    | CA |    | SEE | Total   |    |     |  |
| <b>SEMESTER 3</b>                |   |                            |    |    |     |         |    |     |  |
| CORE                             | Enterprise Cloud Computing                                | 4                          | 0  | 0  | 4   | 40      | 60 | 100 |  |
| CORE                             | .Net Framework and Architecture                           | 4                          | 0  | 0  | 4   | 40      | 60 | 100 |  |
| CORE                             | Software Management & Quality Assurance                   | 3                          | 0  | 0  | 3   | 40      | 60 | 100 |  |
| <b>Business Analytics Stream</b> |   |                            |    |    |     |         |    |     |  |
| DSE                              | Discipline Specific Elective -III                         | 3                          | 0  | 0  | 3   | 40      | 60 | 100 |  |
| DSE                              | Discipline Specific Elective-IV                           | 3                          | 0  | 0  | 3   | 40      | 60 | 100 |  |
| <b>Social Computing Stream</b>   |   |                            |    |    |     |         |    |     |  |
| DSE                              | Discipline Specific Elective - III                        | 3                          | 0  | 0  | 3   | 40      | 60 | 100 |  |
| DSE                              | Discipline Specific Elective – IV                         | 3                          | 0  | 0  | 3   | 40      | 60 | 100 |  |
| CORE                             | Practical IV - .Net Programming                           | 0                          | 0  | 6  | 3   | 40      | 60 | 100 |  |
| CORE                             | Practical V – Social Computing Lab/Business Analytics Lab | 0                          | 0  | 6  | 3   | 40      | 60 | 100 |  |
| GE                               | Generic Elective  | 2                          | 0  | 0  | 2   |         |    |     |  |
|                                  |   | 17                         | 0  | 12 | 25  |         |    |     |  |

CA - Continuous

AssessmentSEE -

SemesterEndExamination

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES  
(VISTAS) M.SC SOFTWARE TECHNOLOGY**

**COURSES OF STUDY AND SCHEME OF ASSESSMENT**

**(TOTAL NO OF CREDITS:96)**

|                   |           | Hours/Week  |         |        |         |    |    |    |     |
|-------------------|-----------|---|---------|--------|---------|----|----|----|-----|
|                   |           | MaximumMarks  | CodeNo. | Course | Lecture |    |    |    |     |
| Tutorial          | Practical | Credits   | CA      | SEE    | Total   |    |    |    |     |
| <b>SEMESTER 4</b> |           |   |         |        |         |    |    |    |     |
| CORE              |           | Project Work/Industry<br>Internship/ Research Work at<br>R & DLab | 0       | 0      | 40      | 20 | 40 | 60 | 100 |

**List of Discipline Specific Elective (DSE)**

**Business Analytical Stream**

| <b>Subjectcode</b> | <b>Title of thePaper</b>                   |
|--------------------|--|
| 19MST101           | Data Mining for BusinessIntelligence       |
| 19MST102           | Data Exploration Using Python.             |
| 19MST103           | Advanced Data Structures & Algorithms      |
| 19MST104           | MachineLearning                            |
| 19MST105           | Big Data Analytics with Map Reduce &Hadoop |
| 19MST106           | Programming Foundations for DataSciences   |
| 19MST107           | Design and Analysis ofAlgorithms           |
| 19MST108           | Mathematics for DataAnalytics              |



|          |                   |
|----------|-------------------|
| 19MST109 | Computer Networks |
| 19MST110 | Ad Hoc Networks   |

### **Social Computing Stream**

| <b>Subjectcode</b> | <b>Title of thePaper</b>                     |
|--------------------|--|
| 19 MST111          | Management Information System                |
| 19 MST112          | Social Media Programming and Content Design. |
| 19 MST113          | Advanced Data Structures & Algorithms        |
| 19 MST114          | Business Intelligence and its Applications   |
| 19 MST115          | Internet of Things and Analytics             |
| 19 MST116          | Augmented Reality Technologies               |
| 19 MST117          | Social Web Programming                       |
| 19 MST118          | Social Commerce                              |
| 19 MST119          | Social Media Marketing                       |
| 19 MST120          | Open Source Technology                       |

### **List of Generic Elective (GE)**

| <b>Subject Code</b> | <b>Title of the Paper</b> |
|---------------------|---------------------------|
| 20GEC01             | Soft Skill – I            |
| 20GEC02             | Soft Skill – II           |
| 20GEC03             | Advance Excel             |
| 20GEC04             | Internet Basics           |

## I SEMESTER

15CMST11

SYSTEMSOFTWARECONCEPTS

4 0 0 4

### COURSE OUTCOME (Employability)

- Study the architecture of a hypothetical machine, its assembly language, macro language.
- Program in assembly language
- Understand the structure and design of assemblers, linkers and loaders
- Understand the concepts and theory behind the implementation of high level programming languages

#### UNIT I

12

Language processors – Language processing activities and fundamentals – Language specification – Development Tools – Data Structures for Language processing- Scanners and Parsers.

#### UNIT II

12

Assemblers: Elements of Assembly language programming - Overview of the Assembly process - Design of a Two-pass Assembler - A single pass Assembler for the IBM PC.

#### UNIT III

12

Macros and Macro processors – Macro definition, call , and expansion – Nested macro calls – Advanced macro facilities - Design of a macro preprocessor - Compilers: Aspects of compilation

#### UNIT IV

12

Compilers and Interpreters – Memory allocation - Compilation of Expressions and Control structures - Code optimization – Interpreters.

#### UNIT V

12

Linkers: Linking and Relocation concepts – Design of a linker – Self relocating Programs – A linker for MS DOS - Linking for over-lays – loaders - Software tools: Software tools for program development - Editors - Debug monitors - Programming environments – User interfaces.

**TOTAL: 60 HOURS**

#### Text Books

1. D. M. Dhamdhere, 1999, Systems Programming and Operating Systems, Second Revised Edition, Tata McGraw-Hill, New Delhi. Reference Books

2. L. L. Beck, 1996, System Software An Introduction to System Programming, 3rd edition, AddisonWesley

**19CMST12**

**PROGRAMMING IN JAVA**

**5 0 0 5**

COURSE OUTCOME (**Employability**)

- Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
- Read and make elementary modifications to **Java programs that solve real-world problems**. Validate input in a Java program
- Identify and fix defects and common security issues in code.
- Use a version control system to track source code in a project.

**UNIT I**

**INTRODUCTION TO JAVA**

**12**

Introduction to Java – Features of Java – **Object Oriented Concepts** – Lexical issues – Data Types – Variables – Arrays – Operators – Control Statements.

**UNIT II**

**CLASSES, OBJECTS AND METHODS**

**12**

**Classes – Objects** – Constructors – Overloading methods – Access control – Static and fixed Methods – String Class – Inheritance – Overriding Methods – Using Super – AbstractClass.

**UNIT III**

**PACKAGES**

**12**

**Packages** – Access Protection – Importing Packages – Interfaces – Exception Handling – Thread – Synchronization – Messaging – **Runnable Interface – Inter Thread Communication**.

**UNIT IV**

**I/O STREAMS**

**12**

I/O Streams – File Streams – Applets – String Buffer – Char Array – Java Utilities – Random, Vector, Calendar and Properties.

Network Basics – Socket Programming – Proxy Server – URL – Datagrams – Working With Windows Using AWT Classes. AWT Controls – Layout Management and Menus.

**TOTAL: 60 HOURS**

**Text Book:**

1. P. Naughton & H. Schildt, “Java2-The Complete Reference”, 5th Edition, Tata McGraw Hill, 2002.

**References:**

1. Cay S. Horstmann, Gray Cornell, “Core Java 2 Volume 1 Fundamentals”, AddisonWesley, 2003.
2. K. Arnold and J. Gosling, “The Java Programming Language”, Second Edition,

**19CMST13 RELATIONAL DATABASE SYSTEMS 4 004**

**COURSE OUTCOME (Employability)**

- Explain the characteristics, architecture of database approach, describe the components, major functions of a database system and give examples of their use.
- Compare and contrast appropriate data models, including concepts in modeling notation and how they would be used
- Demonstrate use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division).
- Give examples of the application of primary, secondary, and clustering indexes, explain the theory and application of internal and external hashing techniques.
- Discuss the PL-SQL programming structures, control structures, functions, procedures with the example programs.





Education Asia,2001.

4. Bipin C. Desai, "An Introduction to Database Systems", Galgotia Publications Pvt. Limited,2001.
5. Oracle Database Handbook (Oracle Press) 2007.

**15CMST14**

**WEBTECHNOLOGY**

**3 003**

**COURSE OUTCOME (Employability)**

- History and development of the World Wide Web and associated technologies.
- The client-server architecture of the World Wide Web and its communication protocol HTTP/HTTPS..
- Formats and languages used in modern web-pages: HTML, XHTML, CSS, XML, XSLT, Javascript, DOM
- Programming web pages with Javascript/DOM (client).
- Good design, universal design, multi-platform web applications.

**UNIT1**

**HTML**

**12**

Internet basics-Introduction toHTML-Structure of HTML-Formatting Tags-Anchor Tag-Image Tag-Working with Frames

**UNIT2:**

**HTML:**

**12**

Working With List-Ordered list-Unordered List-Definition List-Graphics with HTML--Working with Tables-Rowspan and Colspan-Form HandlingWith Html.

**UNIT3:**

**JAVASCRIPT:**

**12**

Introduction to JavaScript- Variables-Constants-Datatypes-Operators-Expression-Control Structures-Functions-Object-DOM-Event Handling

**UNIT4:**

**PHP:**

**12**

**Introduction**to PHP- Variables-Comments-Operators-Looping-Statements-If Statement-Switch Statement Array-Functions-Super Globals

**UNIT5:**

**MYSQL:**

**12**

Introduction to MySQL Database Connectivity; Working with MySQL Statement: Select- Insert- Update- and Delete; Creating Tables and Records-SQL Data types-Creating Database and Tables-Dropping the Database and Tables-Adding and Altering Fields In Tables-Working with PhpMyadmin.

**TOTAL: 60 HOURS**

**TEXT BOOKS:**

1. I. Bayross, "Teach yourself web technology part 1 & 2", BPB, 2010.
2. Coding with Javascript for Dummies, Chris Minnick, Eva Holland, Wiley Brand, 2015.
3. Michele E. Davis and Jon A. Phillips, Learning PHP and MySQL, 2007 edition.



## SEMESTER II

19CMST21

AdvancedJavaProgramming

5005

### COURSE OUTCOME (Employability)

- Students will design and implement programs in the Java programming language that make strong use of classes and objects..
- Learn to print formatted text to the console output and read/parse console input text using a Scanner object.
- Apply logical constructs for branching and loops as well as use iterator objects when appropriate.
- Learn how to handle exceptions and errors. Students will design and implement custom checked and unchecked exception types
- Become familiar with the use of input, output, and object stream objects. Students will use such streams for file processing as well as client/server communications tasks.

### UnitI – AWT & Swings

12

Applets- Architecture, Basics, skeleton, simple applets, Requesting and Repainting HTML applet tag, passing parameters to applets- Graphics- Font,-Colorclasses

Swing-JApplet, JFrame, JComponent Differences between Component and Container,Icons, JLabel, JTextField, JButton, JCheckBox, JRadioButton,JComboBox

### UnitII – Networking

12

Networking basics - Sockets overview - client/server - Reserved Sockets - IP Address -DNS- TCP /IP Client Socket - TCP /IP Server Socket - Datagram - Datagram Packet- Datagram Server and Client.

### UnitIII RMI

12

RMI- Overview – RMI Architecture - Developing Application with RMI Declaring and implementing remote interfaces –Stub and Skeleton –registering Remote objects – writing RMI server –client- EJB Introduction Entity bean –session bean –EJB Transaction.

### Unit-IV JSP

12

JSP Introduction to JSP - JSP life cycle - Attributes in JSP - JSP elements - Directives -

Declarations - Expressions - Script let - Action Elements - using session Object and Cookies-  
**Working with Java Mail** - usage of use Bean Tag.

**UnitV-**

**JDBC &Servlets**

**12**

JDBC/ODBC Driver – **Connection Procedure** with Example - SQL: DDL,DML,TCL – JDBC  
ResultSet- Metadata - ResultSetMetaData - JDBC Statements- Servlets - Life Cycle of Servlet,  
Generic Servlet, HTTP Servlet

**TOTAL: 60 HOURS**

**TEXT BOOK :**

1. Herbert Schildt, Java, The Complete Reference, Mcgraw-Hill EighthEdition,

**REFERENCE**

1. Phil Hanna, Jsp 2.0: The Complete Reference, Mcgraw-Hill/Osborne, 2003

# 19CMST22 MOBILE COMPUTING AND APPLICATION DEVELOPMENT

## 4 0 04

### COURSE OUTCOME (Employability)

- Be exposed to technology and business trends impacting mobile applications
- Be competent with the characterization and architecture of mobile applications.
- Be competent with understanding enterprise scale requirements of mobile applications
- Be competent with designing and developing mobile applications using one application Development framework.

#### UNIT-I: INTRODUCTION 12

Mobile Computing – An overview - Wired Networks vs. Mobile networks-Mobile computing vs. wireless networking – Characteristics of Mobile computing and Applications – Advantages and disadvantages of mobile computing.

#### UNIT-II: MOBILE PROTOCOL AND NETWORKS 12

Mobile internet protocol and transport layer-Mobile telecommunication system – mobile adhoc networks.

#### UNIT-III: MOBILE PLATFORMS 12

Mobile Device Operating Systems- Special Constraints & Requirements-Commercial Mobile Operating Systems- Identifying Various Mobile Platforms: iOS, Android, Blackberry, Windows Phone, Symbian.

#### UNIT-IV: INTRODUCTION TO MOBILE APPLICATION DEVELOPMENT 12

Fundamentals of Mobile App Development-Types of Mobile Apps-Mobile Apps: Usage Scenarios - Identifying various Mobile development Environments - Exploring Android Platform & architecture.

#### UNIT-V: BUILDING ANDROID APPLICATION AND DEBUGGING 12

Building User Interface and adding functionality -Designing and developing simple android applications-Debugging android applications.

**TOTAL: 60 HOURS**

## TEXT BOOKS:

1. KavehPahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education,2003.
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York,2003.

## REFERENCE

1. HazysztofWesolowshi, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002  
Android Studio IDE Quick Reference- A Pocket Guide to Android Studio Development-Ted Hagos.

**19CMST23**

**NETWORKSECURITY**

**4004**

### COURSE OUTCOME (Employability)

- Identify some of the factors driving the need for network security
- Identify and classify particular examples of attacks.
- Define the terms vulnerability, threat and attack
- Identify physical points of vulnerability in simple networks
- Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to Attack, and explain the characteristics of hybrid systems.

**UNITI**

**INTRODUCTION**

**12**

Attacks – Services – Mechanisms – Conventional Encryption – Classical and Modern Techniques –Encryption Algorithms – Confidentiality.

**UNITII**

**PUBLIC KEY ENCRYPTION**

**12**

Public key cryptography RSA (Rivestshamir-adleman) algorithm – Elliptic Curve Cryptography –Number Theory Concepts – Modular arithmetic – Euler’s theorem.

**UNITIII**

**MESSAGEAUTHENTICATION**

**12**

Message Authorization and Hash Functions- Authentication Requirements – Digest Function – Digital Signatures – Digital signature Standards.

**UNITIV      NETWORKSECURITY PRACTICE      12**

Authentication Protocols, **Authentication Applications** – Electronic Mail Security – Internet Protocol Security – Web Security.

**UNITV      SYSTEMSECURITY      12**

Introduction to **security attacks** - Intruders –Types of Intruders – Viruses – Worms – Firewalls Design Principles –Trusted Systems.

**TOTAL: 60 HOURS**

**TEXT BOOKS:**

1. Stallings, “Cryptography & Network Security – Principles & Practice”, Prentice Hall, 3<sup>rd</sup> Edition 2002.

**References:**

1. Bruce, Schneier, “Applied Cryptography”, Toha Wiley & Sons, 2nd Edition, 1996.
2. Man Young Rhee, “Internet Security”, Wiley, 2003.
3. Pfleeger&Pfleeger, “Securityin Computing”, Pearson Education, 3<sup>rd</sup> Edition, 2003.

**SEMESTER III**

**19CMST31**

**ENTERPRISE CLOUD COMPUTING**

**4 0 0 4**

**COURSE OUTCOME (Employability)**

- Define Cloud Computing and memorize the different Cloud service and deployment models

- Describe importance of **virtualization** along with their technologies.
- Use and Examine different **cloud computing services**
- Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing

## **UNIT I CLOUD ARCHITECTURE AND MODEL 12**

Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. **Cloud Models**:- Characteristics – **Cloud Services** – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud – Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

## **UNIT II VIRTUALIZATION 12**

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - **Virtualization Structures - Tools and Mechanisms** - Virtualization of CPU, Memory, I/O Devices- Virtual Clusters and Resource management – Virtualization for Data-center Automation.

## **UNIT III CLOUD INFRASTRUCTURE 12**

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – **Design Challenges** - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

## **UNIT IV PROGRAMMING MODEL 12**

Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - **Cloud Software Environments** - Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

## **UNIT V SECURITY IN THE CLOUD 12**

Security Overview – Cloud Security Challenges and Risks – **Software-as-a-Service Security** – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – **Data Security** – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

**TOTAL: 60 HOURS**

### **References:**

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2016.
2. John W. Rittinghouse and James F. Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2006.

4. Kumar Saurabh, "Cloud Computing – insights into New-Era Infrastructure", Wiley India, 2011.
5. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud", Reilly
6. James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
7. Katarina Stanoevska-Slabeva, Thomas Wozniak, Santi Ristol, "Grid and Cloud Computing – A Business Perspective on Technology and Applications", Springer.
8. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.
9. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, "Mastering Cloud Computing", TMGH, 2013.
10. Gautam Shroff, "Enterprise Cloud Computing", Cambridge University Press, 2011.
11. Michael Miller, "Cloud Computing", Que Publishing, 2008.
11. Nick Antonopoulos, "Cloud computing", Springer Publications, 2010

**19CMST32 .Net Technology 4 0 0 4**

**COURSE OUTCOME (Employability)**

- Understand code solutions and compile C# projects within the .NET framework CO2:
- Demonstrate knowledge of object-oriented concepts
- Design user experience and functional Requirements C#.NET application.
- Construct classes, methods, and assessors, and instantiate objects.

**UNIT I: INTRODUCTION TO .NET TECHNOLOGIES: 12**

Overview of .NET Framework – Feature of .NET Framework – .NET Framework Components – Overview with Focus on CLR, CTS – MSIL – JIT – Assembly – DLL – Meta Data – Application Architecture.

**UNIT II: INTRODUCTION TO C# 12**

C# Building Blocks: Introduction to C# – Overview – Types – Expressions – Declarations – Statements – Classes and Struts – OOPS – Constructors and Destructors

**UNIT III: BASIC WEBSERVER CONTROLS 12**

Windows Controls : Basic web server controls – Rich web server Controls – ToolTip –



ErrorProvider – MainMenu – ContextMenus – Common Dialogs –Date Time Picker – MonthCalendar – Splitter – HelpProvider – StatusBar – Notify Icon – Print Related

**UNIT IV: ADVANCED .NET CONTROLS:**

**12**

**Web Server List Controls:** Check Box List – Radio Button List – Drop Down List – List Box – Bulleted List. Data Controls: Data Grid – Repeater Control – Grid View–Other Web Server Controls: Navigation Controls and Validation Controls.

**UNIT V: OBJECTS AND ADVANCED CONCEPTSINASP.NET:**

**12**

Request Object – Response Object – State Management for **Session, Application, Cookies,Query String** –Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – Data Reader – Data Adapter – ADO.NETClasses.

**TOTAL: 60 HOURS**

**COURSE OUTCOME:**

**TEXT BOOKS:**

1. Andrew Troelsen, "C# and the .Net platform" a press, (UNIT I and UNIT II), 2001.
2. Mridula Parihar, et.al. "ASP .NET Bible" Wiley – Dreamtech India Pvt. Ltd, –2002.

### REFERENCE BOOKS:

1. David S. Platt – "Introducing .Net", Microsoft press, 2002.
2. Alex Homer et. Al, "professional ASP .NET 1.1", Wiley Dreamtech India Pvt.Ltd. 2004.
3. Rebecaam. Riordan, "ADO .NET Step By Step", Microsoft Press.

## 19CMST33 SOFTWARE MANAGEMENT & QUALITY ASSURANCE

### COURSE OUTCOME (Skill Development)

- Understand software testing and quality assurance as a fundamental component of software life cycle
- Define the scope of SW T&QA projects
- Efficiently perform T&QA activities using modern software tools
- Estimate cost of a T&QA project and manage budgets

### UNIT I INTRODUCTION 12

Introduction to Competencies – Product Development Techniques – Management Skills – Product Development Life Cycle – Software Development Process.

### UNIT II DOMAIN PROCESSES 12

Managing Domain Processes – Project Selection Models – Project Portfolio Management – Financial Processes – Selecting a Project Team – Goal and Scope of the Software Project – Project Planning.

### UNIT III SOFTWARE DEVELOPMENT 12

Tasks and Activities – Software Size and Reuse Estimating – The SEI CMM – Problems and Risks – Cost Estimation – Effort Measures – COCOMO. A Regression Model – COCOMO II

### UNIT IV SCHEDULING ACTIVITIES 12

Project Management Resource Activities – Organizational Form and Structure – Software Development Dependencies – Brainstorming – Scheduling Fundamentals – PERT and CPM.

### UNIT V QUALITY ASSURANCE 12

Quality Requirements – The SEI CMM – Guidelines – Challenges – Quality Function Deployment  
– Building the Software Quality Assurance – Plan – Software Configuration Management  
Principles – Requirements.

**TOTAL: 60 HOURS**

Text Book:

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “Quality Software Project Management”, Pearson Education, Asia, 2002.

References:

1. Pankaj Jalote, “Software Project Management in Practice”, Addison Wesley, 2002.
2. Hughes, “Software Project Management, 3<sup>rd</sup> Edition”, Tata McGrawHill, 2004.

## List of Discipline Specific Elective Courses

### Business Analytics Stream

19MST101                      DATA MINING FOR BUSINESS INTELLIGENCE                      4 0 0 4

#### COURSE OUTCOME (Employability)

- Identify the major frameworks of computerized decision support: decision support systems (DSS), data analytics and business intelligence (BI).
- List the definitions, concepts, and architectures of data warehousing
- Demonstrate the impact of business reporting, information visualization, and dashboards
- Describe how analytics are powering consumer applications and creating a new opportunity for entrepreneurship for analytics.
- Effectively communicate course work in writing and oral presentation.

KDD-Taxonomy of data mining task-Architecture of Data mining system-Types of database used for mining-Relational Databases-Data Warehouses-Transaction Databases- Object Oriented Databases-Spatial Databases-Temporal Databases-Text And Multimedia Databases-Heterogeneous Databases-Applications of Data Mining.

**UNIT II -Business IntelligenceanIntroduction** **12**

Introduction, Definition, History and Evolution, Business Intelligence Segments, Differencebetween Information and Intelligence,Defining Business Intelligence Value Chain, Roles of Business Intelligence in Modern Business, Business Intelligence Applications. - Challenges ofBI

**UNIT III-DataPreprocessing** **12**

Why Data Preprocessing – Need for pre-processing-Data cleaning as a process-Data Cleaning-Binning,OutlierAnalysis,Integration,Transformation,DataNormalization,DataReduction,Data Discretization ,DataAggregation.

**UNIT IV-Datamining Techniques** **12**

Association Rule Mining- TheApriori Algorithm- Classification and Prediction –How does Classification works-Building classifier model-Comparison of classification & prediction techniques-Classification by Decision Tree Induction-Prediction methods.

**UNIT V-ClusterTechniques** **12**

Clusters Analysis: Applications & Requirements- **Types of Data in Cluster Analysis**- Clustering Methods:k-meansandk-medoidsclustering-CaseStudies-MiningWWW-MiningTextDatabase-Mining Spatial Database-Applications of datamining inBI.

**TOTAL: 60 HOURS**

**TEXT BOOKS:**

1. J. Han, M. Kamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann.
2. G. Shmueli, N.R. Patel, P.C. Bruce, “Data Mining for Business Intelligence:Concepts, Techniques, and Applications in Microsoft Office Excel withXLMiner”,

**REFERENCES:**

1. PaulrajPonnan, “Data Warehousing Fundamentals”, JohnWilley.
2. M. Dunham, “Data Mining: Introductory and Advanced Topics”, PearsonEducation.

19MST102 DATA EXPLORATIONUSING PYTHON 4 0 0 4

**COURSE OUTCOME** **(Employability)**

- Learn Python Programming basics and essentials, along with Machine Learning for conducting data analytics in Python
- Hybrid Learning with Guided practice & Weekly Practice quiz questions on the app along with the classroom sessions
- Hands-on application of the Tools
- App based learning. Connect with Faculty on the App apart from the regular classroom training

**Objective**

- An understanding of how to use the Python standard library to write programs,access various tools, and document and automate analyticalprocesses.
- With Python, you can perform data manipulation, analysis, andvisualization
- Python provides powerful libraries for Machine learning applications and otherscientific computations

**Unit I: Python Essentials**

12

Data Types (strings, lists, dictionaries, and more),Control Flow (if-then statements, looping), Organizing code (functions, modules, packages), Reading and writing files,Overview of Object- **Oriented Programming (OOP)**

**Unit II: NumPy and2DPlotting**

12

Understanding the N-dimensional data structure, **Creating arrays, Indexing arrays by slicing or more generally with indices or masks**, Basic operations and manipulations on N-dimensional arrays,plotting with

matplotlib

### **Unit III: Pandas: Python Toolkit for Data Analysis**

12

**Data aggregation and reorganization capabilities** for data set explorations, including support for labelling data along each dimension, dealing with missing values, and time series manipulations.

### **Unit IV: Data Preparation**

12

Working with Pandas data structures: **Series and Data Frames**, Accessing your data: indexing, slicing, fancy indexing, Boolean indexing, Data wrangling, including dealing with dates and times and missing data, Adding, dropping, selecting, creating, and combining rows and columns.

### **Unit V: Data Visualization & Analysis**

12

Data visualization: scatter plots, line plots, box plots, bar charts, and histograms with matplotlib, Split-apply-combine with **DataFrames Data summarization and aggregation methods**, Pandas powerful group by method, Reshaping, pivoting, and transforming your data.

**TOTAL: 60 HOURS COURSE OUTCOME:**

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

CO1: Learn Python Programming basics and essentials, along with Machine Learning for conducting data analytics in Python

CO2: Hybrid Learning with Guided practice & Weekly Practice quiz questions on the app along with the classroom sessions

CO3: Hands-on application of the Tools

CO4: App based learning. Connect with Faculty on the App apart from the regular classroom training

**TEXT BOOKS:**

1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython William McKinney, O'Reilly Media
2. Python For Data Analysis – 2013 by Wes McKinney, O'Reilly Media

**REFERENCES:**

1. Introduction to Machine Learning with Python: A Guide for Data Scientists Andreas Müller
3. Mastering Python for Data Science, Samir Madhavan Samir

**COURSE OUTCOME (Skill Development)**

- Identify classes, objects, members of a class and relationships among them needed for a specific problem
- Write Java application programs using OOP principles and proper program structuring Demonstrate the concepts of polymorphism and inheritance
- Create Java programs to implement error handling techniques using exception handling
- Design and develop GUI based applications
- Develop graphics applications

**EXPERIMENTS**

1. Program to define a structure of a basic JAVA program.
2. Program to define operators, arrays and control structures.
3. Program to define class and constructors. Demonstrate constructors.
4. Program to define class, methods and objects.
5. Program to demonstrate method overloading.
6. Program to define inheritance and show method overriding.
7. Program to demonstrate Packages.
8. Program to demonstrate Exception Handling.
9. Program to demonstrate Multithreading.
10. Program to demonstrate Applet structure
11. Program to demonstrate Graphics programming

**TOTAL: 90 HOURS**

**COURSE OUTCOME (Skill Development)**

- Create databases with different types of key constraints.
- Write simple and complex SQL queries using DML and DCL commands.
- Realize database design using 3NF and BCNF.
- Use advanced features such as stored procedures and triggers and incorporate in GUI based application development.
- Create and manipulate data using NOSQL database.

**EXPERIMENTS**

1. Create a database table, add constraints (primary key, unique, check, Not null), insert rows, update and delete rows using SQL DDL and DML commands.
2. Create set of tables, add foreign key constraints and incorporate referential integrity.
3. Query the database tables using different 'where' clause conditions and also implement aggregate functions.
4. Query the database tables and explore sub queries and simple join operations.
5. Query the database tables and explore natural, equi and outer joins.
6. Write user defined functions and stored procedures in SQL.
7. Execute complex transactions and realize DCL and TCL commands.
8. Write SQL Triggers for insert, delete, and update operations in database table.
9. Create View and index for database tables with large number of records.
10. Develop a simple GUI based database application and incorporate all the above-mentioned features.

**TOTAL: 90 HOURS**



**COURSE OUTCOME (Skill Development)**

- Design HTML pages to demonstrate Java Servlets, JSP, Bean and EJB programs.
- Implement Dynamic HTML using Servlet and demonstration of service methods, auto web page refresh, Session tracking using cookie and Http Session in Servlet.
- Learn the fundamental of connecting to the database.
- Demonstrate JSP (page attributes, action tags and all basic tags) and types of EJB application.
- Learn to design and code web applications.

**List of Experiments:**

1. HTML to Servlet Communications
2. Servlet to HTML Communication
3. Applet to Servlet Communication
4. Servlet to Applet Communication
5. Designing online applications with JSP
6. Creating JSP program using JavaBeans
7. Working with Enterprise JavaBeans
8. Performing Java Database Connectivity and storing the students Marks.
9. Creating Web services with RMI.
10. Creating and Sending Email with Java
11. Building web applications for any Departmental Store.
12. Finding Compound Interest and Simple Interest using Session Management.

**TOTAL: 60 HOURS**

**COURSE OUTCOME (Skill Development)**

- Prioritize power of understanding and aids assimilation of vocables. Vocabulary to charge communication with educated words
- Develop comprehensive knowledge through listening leading to answering questions
- Build observation power and infuse self-confidence through group discussions
- Identify methodology for befitting constructional ability
- Experiments with inward looking and visualization of the ‘otherness’ of situations

**1. READING COMPREHENSION AND VOCABULARY****06**

Filling the blanks – Cloze Exercise – Vocabulary building – Reading and answering Questions.

**2. LISTENING AND ANSWERING QUESTIONS.****06**

Listening and writing – Listening and sequencing sentences – Filling in the blanks – Listening and answering questions.

**3. GROUP DISCUSSIONS****06**

Why GD part of a selection process – Structure of a GD – strategies in GD – Team Work – Body Language

**4. CONVERSATION.****06**

Face to face Conversation and Telephone conversation.

**5. SELF- INTRODUCTION AND ROLE PLAY****06****TOTAL: 30 HOURS**

**COURSE OUTCOME (Skill Development)**

- Familiarize with algorithmic techniques such as brute force, greedy, and divide and conquer
- Apply advanced abstract data type (ADT) and data structures in solving real world problems Analyze and apply graph data structure to real-life problems
- Effectively combine fundamental data structures and algorithmic techniques in building a complete algorithmic solution to a given problem

**UNIT I ANALYSIS OF ALGORITHMS 12**

Review of order of growth of functions, recurrences, probability distributions, Average case analysis of algorithms, Randomized Algorithms – Analysis - NP – Complete and NP – Hard Problems – Amortized Analysis

**UNIT II HEAPS 12**

Min Heap – Min-max Heaps – Leftist heaps – Skew leftist heaps – Binomial Heaps – Lazy binomial heaps – Fibonacci Heaps.

**UNIT III TREES 12**

AVL Trees – Red-Black Trees – Splay Trees - B trees - Multi-way search trees –Tries

**UNIT IV ADVANCED TREE STRUCTURES 12**

Point – trees – Quad trees - K-d trees – TV- trees – Segment trees – Static and Dynamic

**UNIT V GEOMETRIC ALGORITHMS 12**

Geometric algorithms – line segment intersection – Map overlay detection – Voronoi diagram

**Total: 60h**

**TEXT BOOKS**

1. H. S. Wilf, Algorithms and complexity, Prentice hall.
2. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Introduction to Algorithms, Prenticehall.

**COURSE OUTCOME (Employability)**

- Gain knowledge about **basic concepts** of Machine Learning
- Identify **machine learning techniques** suitable for a given problem Solve the problems using various machine learning techniques
- Apply Dimensionality reduction techniques.
- Design application using machine learning techniques.

**UNIT I FOUNDATIONS FORML 12**

ML Techniques overview -Validation Techniques (Cross-Validations) - Feature Reduction/Dimensionalityreduction-**Principalcomponentsanalysis**(Eigenvalues,Eigenvectors, Orthogonality

**UNITII CLUSTERING 12**

Distance measures - **Different clustering methods** (Distance, Density, Hierarchical) - Iterative distance-based clustering; - Dealing with continuous, categorical values in K-Means - Constructing a hierarchical cluster - K-Medoids, k-Mode and density-based clustering -Measures of quality of clustering

**UNITIII CLASSIFICATION NAÏVE BAYESCLASSIFIER 12**

Model Assumptions, **Probability estimation** - Required data processing -M-estimates, Feature selection: Mutual information - Classifier K-Nearest Neighbors -Computational geometry;

Voronoi Diagrams; Delaunay Triangulations-K-Nearest Neighbor algorithm; Wilson editing and triangulations -Aspects to consider while designing K-Nearest Neighbor

**UNITIV                  SUPPORT VECTOR MACHINES    12**

Linear learning machines and Kernel space, Making Kernels and working in feature space -**SVM for classification and regression problems**. Decision Trees-ID4, C4.5, CART Ensemble methods  
- Bagging & boosting and its impact on bias and variance - C5.0 boosting - Random forest - Gradient Boosting Machines and XGBoost

**UNITV                          ASSOCIATION RULE MINING    12**

The applications of Association Rule Mining: **Market Basket**, Recommendation Engines, etc.- A mathematical model for association analysis; Large item sets; Association Rules - Apriori: Constructs large item sets with mini sup by iterations; Interestingness of discovered association rules; -Application examples; Association analysis vs. classification -FP-trees

**Total: 60h**

**TEXT BOOKS**

1. Bishop, C. (2006). Pattern Recognition and Machine Learning. Berlin:Springer-Verlag.
2. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e,2008

**COURSE OUTCOME (Employability)**

- Ability to identify **the characteristics of datasets** and compare the trivial data and big data for various applications
- Ability to select and **implement machine learning techniques** and computing environment that are suitable for the applications under consideration
- Ability to solve problems associated with batch learning and online learning, and the **big data characteristics such as high dimensionality**, dynamically growing data and in particular scalability issues
- Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies

**UNIT 1****12**

Introduction to Big Data, Characteristics of Data, and Big Data, Evolution of Big Data, Definition of Big Data, Challenges with big data, Why Big data? Data Warehouse environment, Traditional Business Intelligence versus Big Data. State of Practice in Analytics, **Introduction to big data analytics and Classification of Analytics**, Challenges & importance of Big Data, Big Data Technologies, Data Analytics Life Cycle.,

**UNIT 2****12**

Analytical Theory and Methods: **Clustering and Associated Algorithms**, Association Rules, Apriori Algorithm, Candidate Rules, Applications of Association Rules, Validation and Testing.

**UNIT 3****12**

Analytical Theory and Methods: Classification, **Decision Trees, Naïve Bayes**, Diagnostics of Classifiers, Additional Classification Methods, Time Series Analysis, Box Jenkins methodology, Text Analysis, Steps, Text Analysis Example.

**UNIT 4****12**

Data Product, **Building Data Products at Scale with Hadoop**, Data Science Pipeline and Hadoop Ecosystem, Operating System for Big Data, Concepts, Hadoop Architecture, Spark Basics,

**UNIT 5****12**

Distributed Analysis and Patterns, Computing with Keys, **Design Patterns**, Last-Mile Analytics, Data Mining and Warehousing.

**TOTAL: 60 HOURS**

### **Text Books:**

1. Big Data and Analytics Subhashini, ,Chellappan,SeemaAcharya,WileyFirst
2. Data Analytics with Hadoop-An Introduction for Data Scientists,BenjaminBengfort and Jenny KimO'Reilly2016.
3. Big Data and Hadoop V.K Jain Khanna,Publishing First2018

### **Reference Books:**

Big Data for beginner's –Vince Reynolds

Big Data in Practice By Bernard Marr

**19MST106 PROGRAMMING FOUNDATIONS OF DATASCIENCES 3 0 0 3**

### **COURSE OUTCOME (Employability)**

- Understand the fundamental concepts of data science
- Evaluate the data analysis techniques for applications handling large data
- Demonstrate the various machine learning algorithms used in data science
- Visualize and present the inference using various tools
- Learn to think through the ethics surrounding privacy, data sharing and algorithmic decision- making

### **Unit-1**

Definition – Data Science – **Why Data Science** – Data Scientist – Data Science Process – Data Preparation – Data Exploration – Data Modelling

### **Unit-2**

Big Data – **Characteristics of big data** – general Techniques for Big Data – data storage for big data - Applications of Big data- case study.

### **Unit-3**

Machine Learning – Definition- Key Elements of machine learning - types machine learning algorithms - supervised and unsupervised algorithms -Application of machine learning .

#### **Unit-4**

Deep Learning – Definition - Feed Forward Networks – Optimization for deep learning algorithms  
– Applications of Deep Learning algorithms

#### **Unit-5**

Introduction to Data Visualization – Data Visualization options and Filters – Ethics and Tools:  
Data Science ethics – future Trends of Data science – Data Science Tools.



**COURSE OUTCOMES (Skill Development)**

- Analysis of Algorithms: computational models, order notation, **time and space complexities**, worst-case and expected complexities, lower and upper bounds, Amortized cost
- Techniques for **designing efficient algorithms**: recursion, divide-and-conquer, dynamic programming, balancing and backtracking
- Problems on sets and sequences: merging, sorting, searching, and selection (including external memory)
- Able to do Graph/Network algorithms, String matching algorithms, **Optimization algorithms** LP, IP, SDP.
- Tractable and intractable problems: The classes of P, NP and NP-Complete problems

**UNIT I****INTRODUCTION****12**

Introduction Notion of an Algorithm – Fundamentals of Algorithmic Problem Solving – Important Problem Types – **Fundamentals of the Analysis of Algorithm Efficiency** – Analysis Framework – Asymptotic Notations and its properties – Mathematical analysis for Recursive and Non-recursive algorithms.

**UNIT II****BRUTE FORCE AND DIVIDE-AND-CONQUER****12**

Brute Force - Closest-Pair and Convex-Hull Problems-Exhaustive Search - **Traveling Salesman Problem - Knapsack Problem** - Assignment problem. Divide and conquer methodology – Merge sort – Quick sort – Binary search

### **UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE 12**

Computing a Binomial Coefficient – Warshall’s and Floyd’ algorithm – Optimal Binary Search Trees – Knapsack Problem and Memory functions. **Greedy Technique**– Prim’s algorithm-Kruskal's Algorithm Dijkstra's Algorithm-Huffman Trees.

### **UNIT IV ITERATIVE IMPROVEMENT 12**

The Simplex Method-The Maximum-Flow Problem–Maximum Matching in Bipartite Graphs The Stable marriage Problem

### **UNIT V COPING WITH THE LIMITATIONS OF ALGORITHM 12**

Power Limitations of Algorithm Power-Lower-Bound Arguments-Decision Trees-P, NP and NP Complete Problems--Coping with the Limitations - **Backtracking** – n-Queens problem – Hamiltonian Circuit Problem – Subset Sum Problem-Branch and Bound – Assignment problem – Knapsack Problem – Traveling Salesman Problem- Approximation Algorithms for NP – Hard Problems – Traveling Salesman problem – Knapsack problem.

**Total: 60h**

### **TEXT BOOKS:**

1. A. Aho, J. Hopcroft and J. Ullman “The Design and Analysis of algorithms”

2. D. E. Knuth "The Art of Computer Programming", Vol. I & Vol.2

## REFERENCES:

1. Horowitz Ellis, SahaniSartaz, R. Sanguthevar" Fundamentals of ComputerAlgorithms".
2. Goodman: Introduction to Design and Analysis OfAlgorithms,

**19MST109**

**COMPUTERNETWORKS**

**4 0 0 4**

### **COURSE OUTCOME: (Employability)**

- Familiarize the **different layers** of TCP/IP protocol
- Understand the **working principle of different protocols** at different layers
- Apply networking concepts to real life problems
- Understanding the concept of application layer and working strategy of transport

### **UNIT I INTRODUCTION 12**

Introduction to Networks - Application of Networks - **Architecture Topology** Switching - SLIP, PPP -ALOHA protocols, CSMA/CD, IEEE 802.3, 802.4, 802.5

### **UNITII NETWORK LAYERNETWORKLAYER 12**

Issues- Routing, Congestion control- **Internetworking** - Issues, Address Learning Bridges, Spanning tree, Source routing, Bridges, Routers, Gateway.

### **UNITIII NETWORK PROTOCOL 12**

Network Protocol- **IP datagram** - hop by hop routing, ARP, RARP, DHCP -Sub net Addressing, Address Masking, ICMP, RIP, RIPv2, OSPF, DNS, LAN and WAN Multicast.

### **UNITIV TRANSPORT LAYER 12**

Transport Layer- **Design issues**, Connection Management, Transmission Control Protocol (TCP) User Datagram Protocol (UDP).

### **UNITV APPLICATION LAYER APPLICATION 12**

Layer Protocol- **Telnet** - **TFTP** - **FTP** - **SMTP** - Ping Finger, Bootstrap Network Time ProtocolSNMP.

**Total: 60h**

**TEXTBOOKS:**

1. Andrew S. Tanenbaum and David J. Wetherall, "Computer Networks", 5th Edition, Pearson, 2012.
2. William Stallings, "Data and Computer Communications", 9th Edition, Pearson, 2011

**REFERENCES:**

1. W Richard Stevens and G. Gabriani, "TCP/IP Illustrated - Volume I, The protocols", Pearson Education, 2009
2. Eiji Oki, Roberto Rojas-Cessa, Christian Vogt, Advanced Internet Protocols, Services and Applications, John Wiley and Sons Ltd, 2012

**19MST110**

**ADHOC NETWORKS**

**4004**

**COURSE OUTCOMES (Employability)**

- compare the differences between cellular and ad hoc networks and analyze the challenges at various layers and applications
- summarize the protocols used at the MAC layer and scheduling mechanisms
- compare and analyze types of routing protocols used for unicast and multicast routing examine the network security solution and routing mechanism
- evaluate the energy management schemes and Quality of service solution in ad hoc networks

**UNIT I**

**ROUTING**

**12**

Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – **Multicast Routing** – Tree based and Mesh based protocols – Multicast with Quality of Service Provision

**UNITII                      QUALITY OFSERVICE                      12**

Real-time traffic support – Issues and challenges in providing QoS – Classification of QoS Solutions – MAC layer classifications – **QoS Aware Routing Protocols** – Ticket based and Predictive location based QoS Routing Protocols

**UNITIII                      ENERGY MANAGEMENT ADHOC NETWORKS                      12**

Need for Energy Management – Classification of **Energy Management Schemes** – Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes

**UNITIV                      MESH NETWORKS                      12**

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – **Self Configuration and Auto Configuration** - Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

**UNITV                      SENSOR NETWORKS                      12**

Introduction – Sensor Network architecture – Data Dissemination – Data Gathering – MAC Protocols for sensor Networks – **Location discovery** – Quality of Sensor Networks – Evolving Standards – Other Issues – Recent trends in Infrastructure less Networks

**Total: 60h**

**TEXT BOOKS:**

1. C.Sivarammurthy, B.S.Manoj, "Ad hoc wireless networks - Architectures and protocols" Pearson
2. Education, 2005 Stefano Basagni, Marco Conti, "Mobile ad hoc networking", Wiley Interscience 2004
3. Charles E. Perkins, "Ad hoc networking", Addison Wesley, 2001

**REFERENCES:**

1. Xiuzhen Cheng, Xiao Huang, Ding Zhu DU, "Ad hoc wireless networking", Kluwer Academic Publishers, 2004
2. George Aggelou, "Mobile ad hoc networks - From wireless LANs to 4G networks", McGraw Hill publishers, 2005

## List of Discipline Specific Elective Courses

### Business Analytics Stream

**19MSD111                      MANAGEMENT INFORMATION SYSTEM                      3003**

**Course objective( Employability)**

To understand the fundamental principles of managing the information system and to improve decision making and evaluate the hardware and software requirements for information systems.

UNIT-1: 12

Information system-definition, dimensions of information system- **Roll of information system** in business-Contemporary approaches to information systems-technical approach-behavioral approach-approach of this text-sociotechnical systems

UNIT-2: 12

**Business processes-types** of information system-e-business-e-commerce-e-governance-information system functions in business-organizing the IS functions.

UNIT-3: 12

Impact of information systems on organization and business firms-economic, organizational and behavioural impact-Porter’s **competitive force model**-information system strategies for dealing with competitive forces-internet impact on competitive advantage-Aligning IT with business objectives.

UNIT4: 12

Ethical and social issues related to IT-Moral dimensions of information age-responsibility, accountability and liability-**candidate ethical principles**-professional code of conduct-moral dimensions of Information system-System quality-Data quality and system errors.

UNIT5: 12

IT infrastructure-evolution of IT infra structure-Technology drivers of infrastructure evolution-dealing with platform and infrastructure change-management and governance-making wise infrastructure investments-comparing stages in infrastructure evolution

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Evaluate the role of information systems in today's competitive business environment

CO2: Define an information system from both a technical and business perspective and distinguish between computer literacy and information systems literacy.

CO3: Assess the relationship between the digital firm, electronic commerce, electronic business and internet technology.

CO4: Identify the major management challenges to building and using information systems in organizations.

CO5: Identify managerial risks related to information system organization processing and utilizing.

**TEXT BOOK:**

Kenneth C. Laudon and Jane P. Laudon, Management Information systems, Pearson

**REFERENCE:**

1. Ramesh Behl, James A. O'Brien, George M. Marakas "Management Information system", McGraw Hill.

2. Gordon B. Davis, Margrethe H. Olson "Management Information systems", Indian edition

**19MST112 SOCIAL MEDIA PROGRAMMING AND CONTENT DESIGN 3003**

**Course Objective (Skill Development)**

To understand the popular social media such as Facebook, LinkedIn and their impact for creating awareness on the product and to promote business

UNIT1: 12

Social business fundamentals-Social feedback Cycle-social Web and Engagement-Social Interactions-Social CRM-Outreach and Influencer relations

UNIT2: 12

Social Business-Employee as change agents-Social business ecosystem-social profiles-social applications-brand outpost and communities-Social Ecosystem.

UNIT3: 12

Social Business-innovation cycle-Social CRM and Decision support-social analytics-metrics and measurement-Web Analytics-Business analytics-Best practices in social business

UNIT4: 12

Social CRM and business design-Build a social CRM program-Engagement as customer activity in social web-Social object-build on existing social objects-create new social objects-use social objects-

Unit 5: 12

Social graph-tools-Use of social graph-Measure social graph-Social graph applications-Content publishing and sharing-crowd sourcing-ideation-curation and reputationmanagement

**Total: 60h**

### **COURSE OUTCOME:**

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

CO1: Learn the impact of social media and it's appropriate usage

CO2 :Learn to analyse the content in social media in business..

CO3: Employ strategies for promotion of business

CO4:To identify risk and develop CRM.

CO5: Build innovative techniques for engaging customer.

### **TEXT BOOK:**

1. Dave Evans with Jake Mckee, "Social Media Marketing" Wiley publishingInc.

### **REFERNCES:**

1. Mark D. Hawker, "The developer guide to social programming",Addison-Wesley
2. Min-Yuh-Day,Social Media and Mobile AppsProgramming
3. Matthew A.Russell,Mining the SocialWeb,O'REILLY



**19MST113 PYTHON-SOCIALCONTENT ANALYTICS 3003**

**Course objective: (Employability)**

To learn about various social media, the tools and techniques of collecting the data and analyzing by extracting it.

UNIT-1 12

Introduction to latest social media:-Landscape and importance:-Harnessing Social Data:- Connecting capturing and cleaning:-Advantages and limitations of each social media platforms:- Basic techniques to clean, structure and normalize the data: MongoDB and essential administration methods

UNIT-2: 12

Uncovering brand activities, emotions and popularity on Facebook:-Role of FB on brand activity and reputation:-FB API ecosystem:-Concept of feature extraction and content analysis using keywords, hashtag and verbating extraction

UNIT-3: 12

Analyzing twitter using sentiment analysis:-text mining techniques:-stemming using NLTK:- sentiment analysis using popular python libraries, VADER

UNIT-4: 12

Consumer reaction analyticsonyoutube-CharacteristicsofYoutube-Google developer platform to access and extract data,Next grade technology:-Trends mining on github:-Github API and its characteristics:-Github repositories such as watches, fork

UNIT-5: 12

Scrapping and extracting conversation topic on internet forum, public consumer forums:-Extract forum data using scrapy and beautiful soup in python: Demystifying Pinterest through Network:- advanced social network analysis:-graph mining:-pinterest API-Spark and Amazon web service:- sparks job on Amazon web services

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Learn to capture and collect data in various social media.

CO2 :Understand branding activities and to extract significant data.

CO3: Learn various tools for text mining and sentiment analysis

CO4: Analyze reaction of customer in youtube, GitHub.

CO5: Learn about Amazon Web services and tools.

RECOMMENDED TEXTS:

Siddhartha Chatterjee, Michal Krystyanczuk: Python Social Media Analysis

Reference:

1. Mathew Ganis, Avinash Kohirkar Social Media Analytics”
2. Fabio Nelli “Python for data analytics”

## 19MST114 BUSINESS INTELLIGENCE AND ITS APPLICATION 3003

### Course Objective ( Skill Development)

To understand the concept of business intelligence and the methods for creating, deploying and interaction with various tools for data and report generation.

UNIT-1: 12

Introduction:-purpose and structure of business intelligence systems:-understanding multidimensional analysis concepts:-dimensional data warehouse:-multi-dimensional OLAP:-dimensional data warehouse

UNIT-2: 12

Business intelligence projects:-wizard to create cube:-parent-child dimension:-adding measure and measure groups of a cube:-calculated members:-creating, deploying and browsing a cube

UNIT-3: 12

Using MDX to retrieve values:-calculation scripting:-creation of API's:-Creating reference using financial analysis cubes:-interaction with cubes:-creating standard and drilled down actions

UNIT-4: 12

Creating perspectives:-MDX queries:-Microsoft EXCEL with analysis services:-Data mining concepts:-creating data for data mining:-model creation:-

UNIT-5: 12

Creating data mining queries and reports:-Understanding DMX Language using SQL Server reporting services to develop reports:- mapping mining structures to source data columns:using cube sources:-**configuring algorithm parameters**

**Total: 60h**

### **COURSE OUTCOME:**

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

CO1: Understand the purpose and structure of business intelligence and OLAP.

CO2 :Learn to create, deploy And browsing a cube.

CO3: To perform financial analysis using tools.

CO4:Learn concept of data mining and to develop reports

### **TEXT BOOK**

1 Business Intelligence DCAP606,Lovely ProfessionalUniversity

### **REFERENCE**

1. Wilfried Grossman, RinderleMa Stefanie “Fundamentals of BusinessIntelligence” springer.
2. Marta E Zorillaetal.“Business intelligence applications and the Web” BusinessScience Reference.

**19MST115 INTERNETS OF THINGSANDANALYTICS 4 0 0 4**

### **Course Objective: (Skill Development)**

This course gives a foundation in the Internet of Things, including the components, tools, and analysis by teaching the concepts behind the IoT and a look at real-world solutions.

**UNITI INTRODUCTION 12**

Introduction: IoT data **and Bigdata, Challenges of IoT Analytics Applications.** IoT Analytics lifecycle and Techniques.

**UNITII IOT, CLOUD AND BIGDATA 12**

Cloud –Based IoT Platform, data analytics for the IoT, WAZIUP software platform, iKaaS software platform

**UNIT III DEVELOPMENT TOOLS 12**

Introduction, VITAL Development Environment, Vital Nodes: PPI Modes, system nodes, service nodes, Query systems, query services, query sensors.

**UNIT IV IOT ANALYTICS AS A SERVICE 12**

Architecture for IoT Analytics as a service, Sensing as a service, Scheduling, metering and service delivery

**UNIT V IOT ANALYTICS APPLICATIONS 12**

Management System of Smart Building, IoT based information management system for energy efficiency in smart buildings – edge based IoT analytics

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Understand the definition and significance of the Internet of Things

CO2: Discuss the architecture, operation, and business benefits of an IoT solution

CO3: Examine the potential business opportunities that IoT can uncover

CO4: Explore the relationship between IoT, cloud computing, and big data

CO5: Identify how IoT differs from traditional data collection systems

**TEXT BOOKS:**

1. John Soldatos “Building Blocks for IoT Analytics Internet-of-Things Analytics” River Publishers
2. Andrew Minter “ Analytics for the Internet of Things (IoT)” Ingram short title

**REFERENCES:**

1. Hwaiyu Geng “Internet of Things and Data Analytics Handbook” Wiley

19MST116

AUGMENT REALITY TECHNOLOGIES

4 0 0 4

**Course Objective: (Skill Development)**

To study and understand the concepts of augmented reality technologies. And the purpose of the *course* is to master the foundation of *augmented reality* (AR) and how to create an AR experience using ARCore.

**UNIT I INTRODUCTION 12**

Introduction to Augmented Reality – Definitions-Types of Augmented Reality: Projection, Watermarking Augmented Reality.

**UNIT II SYSTEM ORGANIZATION 12**

Augmented reality system organization, History: Real AR to DARPA, Trend Spotting, Real time context in content.

**UNIT III APPLICATIONS 12**

Key Applications: Scientific, Industrial and Government, Commercial and Enterprise Consumer

**UNIT IV SOFTWARE TOOLS 12**

Software tools and technologies: Khronos Group, ARToolkit: Vuforia, Kuda, GoogleTango, Hololens, Scope AR, View AR, Augmented Reality Operating System.

**UNIT V TECHNOLOGY ISSUES 12**

Technology Issues: Rods, Cones and Fovea, Resolution, Latency issues, Eyebow field of view, Displays, Sensors user Interfaces.

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Expose learners to the basic of AR/VR technology and devices, understanding of various elements and components used in AR/VR Hardware and Software.

CO2: Industrial application of AR/VR technology with hands on experience through more informative and practical exploration

CO3: Working on real life projects using AR/VR technology

CO4: To start their own start-up if they wish and further supports will be provided by GTU Incubation and DIC program in terms of funding, mentoring, fabrication lab support, company formation & legal structure, IPR etc.

CO5: To test and evaluate the virtual environment and the pedagogic content (the multilingual material and the pedagogical activities) from both functional and pedagogical perspectives

### **TEXT BOOKS:**

1. Jon Peddie, “Augmented Reality, Where we will all live” Springer International Publishing
2. Schmalstieg/Hollerer ,“Augmented Reality: Principles” Addison-Wesley (22 June 2016)

### **REFERENCES:**

1. Gregory Kipper and Joseph Rampolla” Augmented Reality: An Emerging Technologies Guide to AR” Syngress; 1st Edition (December 3, 2012)
2. Paul Mealy “Virtual & Augmented Reality For Dummies” For Dummies (8 June 2018)

**19MST117                      SOCIAL WEB PROGRAMMING                      4 0 0 4**

**Course Objective: (Skill Development)**

To understand the concept of semantic web and related applications and learning knowledge representation using ontology. Also to understand human behaviour in social web and related communities and to learn visualization of social networks

**UNIT I                      INTRODUCTION                      12**

Introduction to Semantic Web: Limitations of current Web – **Development of Semantic Web** – Emergence of the Social Web – Social Network analysis: Development of Social Network Analysis – Key concepts and measures in network analysis.

**UNIT II                      ELECTRONIC SOURCES FOR NETWORK ANALYSIS                      12**

**Electronic discussion networks, Blogs and online communities** – Web-based networks – Applications of Social Network Analysis, Review of order of growth of functions, recurrences, probability distributions, Average case analysis of algorithms, Randomized Algorithms – Analysis - NP – Complete and NP – Hard Problems – Amortized Analysis



19MST118

**SOCIAL COMMERCE**

**4 0 0 4**

**Course Objective: (Skill Development)**

Social Commerce is an introductory course in an emerging, quickly developing field which utilizes social media, including Web 2.0 tools and social network sites, to conduct e-commerce, e-marketing and other e-business activities. The course covers the areas of buyer behavior, social media marketing, social enterprise (Enterprise 2.0), social government, crowdsourcing, social entertainment and gaming, social strategy, market research and analytics, Facebook commerce (f-commerce), and several other critical topics.

**UNIT I INTRODUCTION 12**

Opening Case: Starbucks Goes Social - Social Computing and the Social Web - Social Computing - The Social Web - Fundamentals of Web 2.0 and Social Media: What is Web 2.0? - What is Social Media? - Social Commerce: Definitions and Evolution - Definitions and Characteristics - The Evolution of Social Commerce - The Content of the Social Commerce Field - **The Landscape and Major Components of the Field** Consumer Engagement in Social Commerce

**UNIT II TOOLS AND PLATFORMS FOR SOCIAL COMMERCE 12**

Social Media: The Basics - Web 2.0 and Its Major Characteristics - **The Major Social Media Tools:** From Blogs and Microblogs - Social Networks and Social Networking Sites and Services - Mobile Social Commerce

**UNIT III SUPPORTING THEORIES AND CONCEPTS FOR SOCIAL COMMERCE 12**

The Consumer Purchasing-Decision Process - Personalization and Behavioral Marketing - Word of Mouth in Social Commerce - - **Social Psychology Theories, Social Network Analysis**

**UNIT IV SOCIAL MEDIA MARKETING 12**

Developing Market Communication - Social Media for Social Commerce Communication - Owned Social Media - Paid Social Media: **Advertising - Coordinating** Social, Internet, and Traditional Media Promotion Plans

**UNIT V CUSTOMER ENGAGEMENT AND METRICS 12**

Earned Media - **Engagement Techniques** - Reputation Management in Social Media - Search Engine Optimization - Monitor, Measure, and Refine: SM Metrics - Measurement Tools.

**Total: 60h**



## **COURSE OUTCOME:**

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

CO1: Understand the essentials of social commerce and its strategic value.

CO2: Define social media and describe their composition and tools.

CO3: Describe the components of social commerce

CO4: Discuss how social media can engage customers in social commerce activities

CO5: Be familiar with many applications of social commerce such as social entertainment, social government and social learning.

## **TEXTBOOKS:**

1. Efraim Turban, Judy Strauss, Linda Lai "Social Commerce Marketing, Technology and Management" Springer International Publishing

## **19MST119 SOCIAL MEDIA MARKETING 4004**

### **Course Objective: (Employability)**

This course provides an introduction to social media marketing (SMM). It is built around a proven eight-step social media planning model provides you with a cumulative learning experience, showing you how to construct social media strategies that achieve desired marketing goals.

### **UNIT I INTRODUCTION 12**

. Social Media Definition - **Social Media and Marketing** - Social Media as a Guidepost - Social Media's Impact on the Purchase Funnel - The Social Feedback Cycle - The Elements of Social Media

### **UNIT II WEB 2.0, THE SOCIAL WEB 12**

Social Networks: The Power of the Collective - Sarnoff's Law - Metcalfe's Law - Reed's Law - Social Media Begins Here - Engaging with Social Media - Monday: Using Blogs and Wikis - **Multimedia - Microblogs and Tagging - RSS - Social Networks**

### **UNIT III THE SOCIAL FEEDBACK CYCLE 12**

Social Media in Marketing - Consideration and the Purchase Funnel - Consumer-Generated Media - Create Your Social Feedback - The Social Feedback Cycle - Define Campaign Objectives - The Awareness Phase - The Point of Sale - **Touchpoints and the Social Web** - Identifying Touchpoints - Quantifying Touchpoints - Building Social Networks

**UNITIV INFLUENCE AND MEASUREMENT 12**

Influence and the Social Web - Quantifying the Conversation - Monday and Tuesday: Influence and Metrics - Applying Influence: **Social Media - Metrics—From Influence to ROI - Quantifying the Social Feedback Cycle**

**UNITV SOCIAL CONTENT—TEXT, PHOTOS, AUDIO,ANDVIDEO 12**

Advertising and the Social Web - Explore Corporate Blogs - Experience Microblogs - Consider Photo and Video Sharing - **Experience Audio and Video Podcasting** - Create Your Social Media Marketing Plan Marketplace Conversations - Building - Understand Consensus and Marketing - Win the Popularity Contest

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Define social media marketing goal setting necessary to achieve successful online campaigns.

CO2: Describe the history of social media marketing, its rapidly evolving role in public relations, advertising, and marketing, as well as the merging of social media marketing with all facets of business.

CO3: Explain how to develop effective social media marketing strategies for various types of industries and businesses.

CO4:Use social media platforms (e.g., blogs, microblogs, social networks, bookmarking, social news, Q&A sites, photo & video sharing, and podcasting) to influence consumer and promote a company, brand, product, service or person.

**TEXTBOOKS:**

2. Evans, D. (2012). Social media marketing : An hour a day. ProQuestEbookCentral

**Course Objective: (Skill Development)**

Introducing an open source technology for development of web applications and to study the problems with traditional commercial software. To understand the open source scripting language for programming in web environment i.e. PHP.

**UNIT I INTRODUCTION 12**

The need of open Sources, advantages of Open sources application, Open Source Development Model Licenses and Patents, FOSS, BSD, Free Software Movement. Copyrights and copy lefts, Application of Open Sources - Problems with traditional commercial software.

**UNIT II OPEN SOURCE SCRIPTING LANGUAGE. INTRODUCTION 12**

What is PHP? - Basic Syntax of PHP – programming in web environment - Common PHP Script Elements - Using Variables - Constants – Data types - Operators ; Statements - Working With Arrays-Using Functions – OOP-String Manipulation and Regular Expression, File and Directory Handling , Working With Forms , Introduction to advanced PHP concepts

**UNIT III OPEN SOURCE DATABASE MANAGEMENT SYSTEM 12**

MySQL: Introduction - Setting up an account - Starting, Terminating and writing your own MySQL Programs - Record Selection Technology - Working with Strings - Date and Time - Sorting Query Results module- Generating Summary- Working with Metadata- Using Sequences – MySQL and Web.

**UNIT IV PHP AND SQL DATABASE 12**

PHP and SQL database: PHP and LDAP; PHP Connectivity; Sending and receiving emails, PHP Database Connectivity: Retrieving data from MySQL - Manipulating data in MySQL using PHP

**UNIT V WEB SERVER 12**

Apache Web server – Working with web server – Configuring and using apache web server, WAMP server, Lighttpd, Ftornd, Nginx, Savant, tornado. Open Source Software tools and Processors: Introduction – Eclipse IDE Platform – Compilers – Model driven architecture tools – Selenium ID – Features and uses Government Policy toward Open Source (E-Governance)

**Total: 60h**

**COURSE OUTCOME:**

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

CO1: Learned the need of open source technology, open source development model, application of open sources, aspects of open source movement

CO2: The students will be aware about the problems with traditional commercial software.

CO3: The student will be familiar with basis syntax of PHP, common PHP scripts elements.

CO4: The student will be familiar with creating of the serverside scripting using PHP, implement PHP database connectivity, perform operation on database and open sourced database management system

CO5: The students will be familiar with Working of different web Servers. The students will be aware about the software tool and process like Eclipse IDE, Selenium ID

**TEXTBOOKS:**

1. TheLinuxKernelBookRemCard, EricDumasandFrankMevelWileyPublicationssons, 2003
2. MySQL Bible Steve Suchring John Wiley sons, 2002

**REFERENCES:**

1. Programming PHP RasmusLerdorf and Levin Tatroe O'ReillyPublications,