

SYLLABUS FOR M.C.A. 3rd SEMESTER

PAPER : IT 31 : INTERNET AND WEB TECHNOLOGY.

Full marks: 75, Pass Marks: 30, Time : 3 Hrs. Credits: 3

12 Questions will be set two from each module and students will be required to answer six (06) question one from each module.

Course Objectives

This course enables the students:

1.	This Subject is useful for Making own Web page and how to host own web site on internet.
2.	Along with that Students will also learn about the protocols involved in internet technology.

Course Outcomes

After the completion of this course, students are expected to

A.	Identify about the technologies used in internet.
B.	students would have capability to make own web site and host their own web site on internet

Module 01 (Lecture 03)

Introduction to WWW: History, Protocols and programs, secure connections, application and development tools, the web browser, what is server, choices, setting up UNIX and Linux web servers, Logging users, dynamic IP

Module 02(Lecture 08)

Introduction to HTML: The development process, Html tags and simple HTML forms, web site structure
Introduction to XHTML: XML, Move to XHTML, Meta tags, Character entities, frames and frame sets, inside browser. Style sheets: Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, border sand boxes, margins, padding lists, positioning using CSS

Module 03 (Lectures 06)

Javascript: Client-side scripting, what is Javascript, how to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition

Module 04 (Lecture 07)

Advance script, Javascript and objects, Javascript own objects, the DOM and web browser environments, forms and validations

DHTML: Combining HTML, CSS and Javascript, events and buttons, controlling your browser

Module 05 (Lecture 07)

XML: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT.

Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT

Module 06 (Lecture 07)

PHP : Starting to script on server side, Arrays, function and forms, advance PHP

Databases : Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs.

Text books:

2. Steven Holzner Title : “Web Technologies, black book”.Jan,2009, 5th edition, Dreamtech Press
3. P.J. Deitel& H.M. Deitel Pearson. “Web Applications : Concepts and Real World Design”, 2006 Wiley-India

Reference books:

1. Lynn Beighley& Michael Morrison , “Head First PHP & MySQL”- 2009 5th edition Pearson Education
2. Laura Lemay, “Mastering HTML, CSS & Javascript Web Publishing “ -2016 First edition BPB Publications

PAPER : IT 32 : SOFTWARE ENGINEERING

Fullmarks: 75, Pass Marks: 30, Time : 3 Hrs. Credits:3

12 Questions will be set two from each module and students will be required to answer six (06) question one from each module.

Course Objectives

This course enables the students:

1.	To understand principles, concepts, methods, and techniques of the software engineering approach to producing quality software (particularly for large, complex systems).
2.	To organize and manage a medium-sized software development project, including project plans and documentation, schedule and cost estimates, and quality assurance activities.
3.	To make effective technical oral and written presentations.
4.	To function effectively as a member of a team engaged in technical work.
5.	To think critically about ethical and social issues in software engineering.

Course Outcomes

After the completion of this course, students are expected to

A.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
B.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
C.	An ability to communicate effectively with a range of audiences
D.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
E.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

Module 01(Lecture 06)

Introduction: Software Crisis, Software Processes, Software life cycle models: Waterfall, Prototype, Evolutionary, Spiral, V- shaped, Agile

Module 02(Lecture 06)

Software Requirement Analysis and Specifications: Problem Analysis, Data Flow Diagrams, Data Dictionaries, Entity-Relationship diagrams, Software Requirement and Specifications, Behavioural and non-behavioural requirements, Software Prototyping.

Module 03(Lecture08)

Software Design: Project Scheduling, Staffing, Software Configuration Management, Cohesion& Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, User Interface Design,UML.

Module 04(Lecture08)

Software Testing: Validation &Verification, Software process, Functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Structural testing: Path testing, Data flow and mutation testing, unit testing, integration and system testing, Debugging, Testing Tools & Standards.

Module 05(Lecture 08)

Software Project Planning: Software Project Metrics: Size Metrics like LOC, Token Count, Function Count, Cost estimation, static, Single and multivariate models, COCOMO Model, Risk management.

Module 06(Lecture 06)

Software Reliability: Failure and Faults, Reliability Models: Basic Model, Logarithmic Poisson Model, Calendar time Component, Reliability Allocation. Overview of Quality Standards like ISO 9001
CASE Tools: Concepts, use and application.

Text books: -

3. Roger S. Pressman, “Software Engineering: A practitioner’s Approach”, 7th Edition, TMH,2017.
4. Rajib Mall, Fundamentals of Software Engineering”, 5th Edition, PHI,2018.

Reference books: -

3. Ian Sommerville , “Software Engineering”, 9th Edition, Pearson,2010
4. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, “Fundamental of Software Engineering “2nd Edition, Pearson,2015.

PAPER : IT 33 : WSN& INTERNET OF THINGS

Fullmarks: 75, Pass Marks: 30, Time: 3 Hrs. Credits:3

12 Questions will be set two from each module and students will be required to answer six (06) question one from each module.

Course Objectives

This course enables the students:

1.	Understand various sources of IoT &M2M communication protocols.
2.	Describe Cloud computing and design principles of IoT.
3.	Become aware of MQTT clients, MQTT server and its programming.
4.	Understand the architecture and design principles of WSNs.
5.	Enrich the knowledge about MAC and routing protocols in WSNs.

After the completion of this course, students are expected to

A.	Describe the OSI Model for the IoT/M2M Systems.
B.	Understand the architecture and design principles for IoT.
C.	Learn the programming for IoT Applications.
D.	Identify the communication protocols which best suits the WSNs

Module 01(Lecture 07)

IoT Conceptual Framework, IoT Architectural View, Technology Behind IoT, Sources of IoT,M2M communication, Examples of IoT. Modified OSI Model for the IoT/M2M Systems, data enrichment, data consolidation and device management at IoT/M2M Gateway, web communication protocols used by connected IoT/M2M devices, Message communication protocols (CoAP-SMS, CoAP-MQ, MQTT, XMPP) for IoT/M2M devices.

Module 02(Lecture 06)

Internet connectivity, Internet-based communication, IPv4, IPv6,6LoWPAN protocol, IP Addressing in the IoT, Application layer protocols: HTTP, HTTPS, FTP, TELNET and ports.

Module 03(Lecture 08)

Introduction, Cloud computing paradigm for data collection, storage and computing, Cloud service models, IoT Cloud- based data collection, storage and computing services using Nimbits.

Module 04(Lecture 07)

Introduction, Prototyping Embedded device software, Programming Embedded Device Arduino Platform using IDE, Reading data from sensors and devices, Devices, Gateways, Internet and Web/Cloud services software development.

Module 05(Lecture 08)

Programming MQTT clients and MQTT server. Introduction to IoT privacy and security. Vulnerabilities, security requirements and threat analysis, IoT Security Tomography and layered attacker model.

Module 06 (Lecture 06)

Challenges for Wireless Sensor Networks, Enabling Technologies for Wireless Sensor Networks. Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes, Operating Systems and Execution Environments, Network Architecture-Sensor Network Scenarios, Optimization Goals and Figures of Merit, Design principles for WSNs, Service interfaces of WSNs Gateway Concepts.

Text books:

1. RajKamal, ||InternetofThings-Architectureanddesignprinciples||, McGrawHillEducation.
2. Holger Karl & Andreas Willig, "Protocols And Architectures for Wireless Sensor Networks" , JohnWiley,2005.

Reference books:

1. KazemSohraby, Daniel Minoli, & TaiebZnati, —Wireless SensorNetworksTechnology, Protocols, And Applications||, John Wiley,2007.
2. Anna Hac, —Wireless Sensor Network Design||, John Wiley,2003.

PAPER : IT 34 : DATA MINING

Fullmarks: 75, Pass Marks: 30, Time : 3 Hrs. Credits:3

12 Questions will be set two from each module and students will be required to answer six (06) question one from each module.

Course Objectives

This course enables the students:

1.	To learn the overview of data mining principles and approaches.
2.	This course will introduce the concepts of data ware house and data mining, which gives a complete description about the principles.
3.	To describe the strengths and limitations of various clustering algorithms and to choose the appropriate algorithm.
4.	Student will be able to understand architectures, applications, design and implementation of data mining and data ware housing concepts.
5.	To learn the concepts of data mining, with illustrations of current state of the art research and applications.

Course Outcomes

After the completion of this course, students are expected to

A.	Understand the functionality of the various data mining and data warehousing component.
B.	Learn the strengths and limitations of various data mining and data warehousing Models.
C.	Explain the analyzing techniques of various data.
D.	Describe different methodologies used in data mining and data ware housing.
E.	Compare different approaches of data ware housing and data mining with various Technologies.

Module 01 (Lecture 08)

Data Mining- Introduction, Data, Types of Data, Data Mining Functionalities, Interestingness of Patterns, Classification of Data Mining Systems, Data Mining Task Primitives, Integration of a Data Mining System with a Data Warehouse, Issues, Data Preprocessing.

Module 02 (Lecture 06)

Data Warehousing- Data warehousing Components, building a Data warehouse, Mapping the Data Warehouse to a Multiprocessor Architecture, DBMS Schemas for Decision Support, Data Extraction, Cleanup and Transformation Tools, Metadata.

Module 03 (Lecture 06)

Business Analysis- Reporting and Query tools and Applications, Tool Categories, The Need for Applications, Online Analytical Processing (OLAP), Multidimensional Data Model, OLAP Guidelines, Multidimensional versus Metarelational OLAP, Categories of Tools, OLAP Tools and the Internet.

Module 04 (Lecture 06)

Association Rule Mining - Mining Frequent Patterns, Associations and Correlations, Mining Methods, Mining various Kinds of Association Rules, Correlation Analysis, Constraint Based Association Mining

Module 05 (Lecture 06)

Classification - Classification and Prediction, Basic Concepts, Decision Tree Induction, Bayesian Classification, Rule Based Classification, Classification by Back propagation, Support Vector Machines Associative Classification, Lazy Learners, Other Classification Methods, Prediction.

Module 06 (Lecture 08)

Clustering and Trends in Data Mining- Cluster Analysis, Types of Data, Categorization of Major Clustering Methods, K-means, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid Based Methods, Model-Based Clustering Methods, Clustering High Dimensional Data Constraint-Based Cluster Analysis, Outlier Analysis, Data Mining Applications.

Text book:

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining and OLAP", Tata McGraw – Hill Edition, Thirteenth Reprint 2008.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Third Edition, Elsevier, 2012.

Reference books:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson Education 2007.
2. K. P. Soman, Shyam Diwakar and V. Aja, "Insight into Data Mining Theory and Practice", Eastern Economy Edition, Prentice Hall of India, 2006.

LABORATORY SYLLABUS FOR M.C.A. 3RD SEMESTER

PAPER: IT-31P: INTERNET LAB

Full marks: 75(25(INTERNAL)+50(EXTERNAL)), Pass Marks: 30, Time: 3 Hrs. Credits: 3

Sl. No.	List of Experiments
01.	CreateHTMLdocumentcodetodevelopaWebpagehavingthebackgroundinred andtitle“MyFirstPage”inanyothercolourandgivingdetailsofyourname,age, telephonenumber,address,enrolmentnumberalignedinproperorder.
02.	Create HTML code to design a page containing paragraphs giving suitable heading style.
03.	CreateawebpagetoshowdifferentattributesofFonttagsuchascolour,sizefaceandanother showdifferentattributes:italics,bold,underlineandalsothispagehavingbackground colour green, giving text colour blue.
04.	CreateaWebpageofredcolouranddisplaylinksinbluecolourwriteappropriatecontentand insertanimagetowardstheleft-handsofthepage.Whenuserclicksonthe image, it should open another web page.
05.	CreateaWebpageusinghrefattributeofanchortag&theattribute: <i>alink,vlink</i> etc and display a moving message in redcolour.
06.	Create an HTML document containing an ordered nested list and unordered nested list showing the content page of engineering college, medical college and general college.
07.	Create a web page containing a table having name of five countries and their capitals.
08.	Create HTML page to show the logical style tags and physical style tags.
09.	Design a form in web page using level, all input types such text as well clickable option.
10.	CreateanHTMLformthatinputsemployeedetailsanddisplaythesameonthe HTMLpage.
11.	To find the addition of two numbers in web page.
12.	To displays the multiplication table.
13.	Create a web page in dynamic form.
14.	Write a program of XML using key attributes.

Tools Required: IDE, Atom, Visual Studio Code

Server: Wamp Server/XAMPP Server/Tomcat Server

Operating System Required: Windows 7/10

PAPER: IT-33P: SOFTWARE ENGINEERING LAB

Full marks: 75(25(INTERNAL)+50(EXTERNAL)), Pass Marks: 30, Time: 3 Hrs. Credits:

3

SI.	Name of Experiment
01.	Study of SRS (Software Requirement Specification) for one the following problems: Library Management System/ATM System/Hospital Management System/Online Marketing System.
02.	Study of Software development Life Cycle Model with an example: <ul style="list-style-type: none">• WaterfallModel<ul style="list-style-type: none">○ Classical WaterfallModel○ Iterative WaterfallModel• SpiralModel• Prototype Model
03.	Software design Principal: Draw the data flow diagram & structure chart for Library Management System/ATM System/Hospital Management System/ Online Marketing System.
04.	Introduction to UML. Design the Use case Model & Class diagram for Library Management System/ATM System/Hospital Management System/Online Marketing System.
05.	Design the Sequence diagram & Collaboration diagram for Library Management System/ATM System/Hospital Management System/Online Marketing System.
06.	Design the Activity diagram & State Chart diagram for Library Management System/ATM System/Hospital Management System/Online Marketing System.
07.	Design the Component diagram for Library Management System/ATM System/Hospital Management System/Online Marketing System.
08.	Design the Deployment diagram for Library Management System/ATM System/Hospital Management System/Online Marketing System.
09.	To Study various Software Metrics.
10.	To study about Integration Testing Identify the uses of Stubs or drivers in the context of an Integration Testing.

Tools Required: STAR UML/Microsoft Visio/Rational Rose Operating System Required: Windows 7/10