3rd Year B.Tech. - Compter Science and Engineering
1st Semester Course Structure

Regulations: R15-CBCS   **Admission to I-Year: 2015-16**   **With effect from Academic year 2017-18 Onwards**

Sl. No.	Subject Code	Subject	Category	Periods per Week		Credits	Scheme of Examination Maximum Marks			Pg. No.
				L	T/P /D		Internal	External	Total	
1	37301	Web Technologies	PC	4	0	4	30	70	100	1
2	38301	Managerial Economics And Financial Analysis	HS	3	1	3	30	70	100	3
3	35301	Operating Systems	PC	3	1	3	30	70	100	5
4	35302	Data Communication and Computer Networks	PC	4	1	4	30	70	100	7
5	**Open Elective-I: Enclosed: Annexure-A**		OE	3	0	3	30	70	100	
Practicals										
6	37331	Web Technologies Lab	PC	-	3	2	30	70	100	9
7	38331	Advanced English Comunication & Soft Skills Lab	PC		3	2	30	70	100	11
8	35331	Hands on Mobile Application Development with Android	PC	-	3	2	30	70	100	12
9	38332	Effective Technical Communication Lab	HS	-	2	1	30	70	100	14
			Total	**17**	**14**	**24**	**270**	**630**	**900**	
			Total Hours	**31**						

Service Courses of 3rd Year 1st sem. B.Tech. (CSE)

Sl. No.	Subject Code	Subject	Branch & Category		Periods per Week		Credits	Scheme of Examination Maximum Marks			Pg. No.
					L	T/P/D		Internal	External	Total	
1	35303	Software Engineering	IT	PC	3	1	3	30	70	100	16
Practicals											
1	35332	CASE Tools Lab	IT	PC	-	3	2	30	70	100	15

Note: Lecture Hours (L), Tutorials (T), Practicals (P), Drawing (D) & Credits (C)

1. PC : PROFESSIONAL CORE   **2. OE : OPEN ELECTIVE**
3. HS : HUMANITIES AND SCIENCES

3rd Year B.Tech. - Computer Science and Engineering
2nd Semester Course Structure

Regulations: R15-CBCS   Admission to I-Year: 2015-16   With effect from Academic year 2017-18 Onwards

Sl. No.	Subject Code	Subject	Category	Periods per Week L	Periods per Week T/P /D	Cre dits	Internal	External	Total	Pg. No.
1	35351	Software Engineering	PC	3	1	3	30	70	100	16
2	34359	Microprocessor and Interfacing	PC	4	-	4	30	70	100	18
3	35352	Visual Programming using C# and .Net	PC	4	-	4	30	70	100	20
Professional Elective-I:										
4	35353	Introduction to Analytics	PE	3	1	3	30	70	100	22
	35354	Computer Graphics								24
	35355	Network Security								26
	37356	Information Security Management								28
5		**Open Elective-II:** **Enclosed: Annexure-A**	OE	3	0	3	30	70	100	
Practicals										
6	35381	R- Programming and CASE Tools Lab	PC	-	3	2	30	70	100	29
7	35382	Visual Programming using C# and .Net Lab	PC	-	3	2	30	70	100	30
8	34384	Microprocessors and Interfacing lab	PC	-	3	2	30	70	100	31
9	38382	Quantitative Ability Lab	HS	-	2	1	30	70	100	32
			Total	**17**	**13**	**24**	**270**	**630**	**900**	
			Total Hours	**30**						

Service Courses of 3rd Year 2nd semester B.Tech. (CSE)

Sl. No.	Subject Code	Subject	Branch & Category		Periods per Week L	Periods per Week T/P /D	Credits	Internal	External	Total	Pg. No.
1	35354	Computer Graphics	IT	PE	3	1	3	30	70	100	24
2	35353	Introduction to Analytics	IT	PE	3	1	3	30	70	100	22

Note: Lecture Hours (L), Tutorials (T), Practicals (P), Drawing (D) & Credits (C)

1. PC : PROFESSIONAL CORE   **2. PE : PROFESSIONAL ELECTIVE**
3. OE : OPEN ELECTIVE   **4. HS : HUMANITIES AND SCIENCES**

4th Year B.Tech. - Compter Science and Engineering
1st Semester Course Structure

Regulations: R15-CBCS   Admission to I-Year: 2015-16   With effect from Academic year 2018-19 Onwards

Sl. No.	Subject Code	Subject	Category	Periods per Week		Credits	Scheme of Examination Maximum Marks			Pg. No.
				L	T/P /D		Internal	External	Total	
1	35401	Automata & Compiler Design	PC	3	1	3	30	70	100	33
2	35402	Linux Programming	PC	3	1	3	30	70	100	35
3	35403	Data Warehousng and Data Mining	PC	3	1	3	30	70	100	37
Professional Elective - II:										
4	35404	MVC through Scripting Languages	PE	3	1	3	30	70	100	39
	35405	Big Data Analytics								41
	37406	Information Security Assessments and Audits								43
	35406	Soft Computing								45
Professional Elective - III:										
5	35407	Design Patterns	PE	3	1	3	30	70	100	47
	35408	Semantic Web and Social Networks								48
	35409	Web Services and Cloud Computing								50
Professional Elective - IV:										
6	37410	Internet of Things	PE	3	1	3	30	70	100	52
	35410	Wireless Networks and Mobile Computing								54
	35411	Software Testing Methodologies								56
Practicals										
6	35431	Linux Programming Lab	PC	-	3	2	30	70	100	58
7	35432	Data Mining and Compiler Design Lab	PC		3	2	30	70	100	59
8	35433	Industry Oriented Mini Project	PC	-	2	2	30	70	100	
			Total	**18**	**14**	**24**	**270**	**630**	**900**	
			Total Hours	**32**						

Service Courses of 4th Year 1st sem. B.Tech. (CSE)

Sl. No.	Subject Code	Subject	Branch & Category		Periods per Week		Credits	Scheme of Examination Maximum Marks			Pg. No.
					L	T/P/D		Internal	External	Total	
Practicals											
1	35431	Linux Programming Lab	IT	PC	-	3	2	30	70	100	58

Note: Lecture Hours (L), Tutorials (T), Practicals (P), Drawing (D) & Credits (C)

1. PC : PROFESSIONAL CORE   2. PE : PROFESSIONAL ELECTIVE

4th Year B.Tech. - Computer Science and Engineering
2nd Semester Course Structure

Regulations: R15-CBCS   **Admission to I-Year: 2015-16**   **With effect from Academic year 2018-19 Onwards**

Sl. No.	Subject Code	Subject	Category	Periods per Week L	Periods per Week T/P/D	Credits	Internal	External	Total	Pg. No.
1	38451	Management Science	HS	4	0	4	30	70	100	61
2	**Open Elective-III Enclosed: Annexure-A**		OE	3	0	3	30	70	100	
Professional Elective - V:										
3	37456	Adhoc and Sensor Networks	PE	3	1	3	30	70	100	63
	35453	Machine Learning								65
	35454	Predictive Analytics								67
	35455	Image Processing and Pattern Recognition								69
	37455	Information Security Incident Response & Management								71
4	35481	Seminar	PC	0	6	2	100	0	100	
5	35482	Comprehensive Viva	PC	0	0	2	0	100	100	
6	35483	Project Work	PC	0	15	10	30	70	100	
			Total	**10**	**22**	**24**	**220**	**380**	**600**	
			Total Hours	**32**						

Service Courses of 4th Year 2nd semester B.Tech. (CSE)

Sl. No.	Subject Code	Subject	Branch & Category		Periods per Week L	Periods per Week T/P/D	Credits	Internal	External	Total	Pg. No.
1	35454	Predictive Analytics	IT	PE	3	1	3	30	70	100	67
2	35456	Design Patterns	IT	PE	3	1	3	30	70	100	47

Note: Lecture Hours (L), Tutorials (T), Practicals (P), Drawing (D) & Credits (C)

1. HS : HUMANITIES AND SCIENCES   **2. PE : PROFESSIONAL ELECTIVE**
3. OE : OPEN ELECTIVE   **4. PC : PROFESSIONAL CORE**

37301

WEB TECHNOLOGIES
(Common to CSE & IT)

Instruction	:	4 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	4	End Exam Duration	:	3 Hours

Prerequisites: Object Oriented Programming through Java

Course Objectives:

1. To learn the basics of HTML elements
2. To learn the basics of java Console and GUI based programming
3. To introduce XML and processing of XML Data with Java
4. To introduce Server side programming with Java Servlets and JSP
5. To introduce Client side scripting with JavaScript and AJAX.

Unit I
HTML Graphics: div, span, layers, image maps
CSS: Syntax structure, using style sheets, borders, margins, box model, fonts, and other advanced elements.
JavaScript: Introduction to JavaScript, data types, operators, loop structures, conditions, functions, Arrays, Objects, Regular expressions, error handling, JS HTML DOM, JS Browser DOM, JSON

Unit II
Introduction to Jquery: Syntax, selectors, events, effects, traversing
XML: Syntax, namespaces, DTD, Schema, XSLT, XML Processors-DOM,SAX, Introduction to AJAX

Unit III
Database Technologies: JDBC Drivers and types, JDBC Configuration (Database URLs, Registering a driver, connecting to a database), Executing SQL statements (Statement and ResultSet classes), query execution (prepared statements and callable statements), Scrollable and Updatable result sets, row sets, Meta data, transactions.
Web servers: An introduction to the various Web Servers (discuss the features and merits of 2-3 Web servers including Tomcat). A brief discussion of HTTP and its relevance to Web programming, Web application structure and deployment in Tomcat.

Unit IV
Servlet Technology: Servlets necessity, Servlet lifecycle, The Servlet API packages and class and interface hierarchy, Basic servlet program template, Handling requests and responses, Using form parameters, Using ServletContext and ServletConfig objects, Using initialization parameters (both context and config level), Session management (Cookies, Session API, URL Rewriting), Security issues, Servlet Listeners and Filters.

Unit V
JSP Technology: The Anatomy of a JSP Page, JSP Lifecycle, Scripting elementsScriplets, expressions, declarations, comments), JSP Directives, JSP Standard actions, JSP Implicit objects, JSP page scope, JSTL Concepts.
Expression Language: EL operators, EL Objects, EL functions, TLDs.
Error handling, developing custom tag libraries.

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Able to write html, CSS codes
CO 2	:	Demonstrate JavaScript, XML, and DHTML and related Technologies.
CO 3	:	Implement the Database Connectivity and Component Technologies like Beans
CO 4	:	Deploy the servlet technology & API
CO 5	:	Construct the fundamentals of JSP, EL (Expression Language)

Text Books:

1. Beginning HTML, XHTML, CSS, and JavaScript, Jon Duckett, Wrox Publications, 2010
2. Head First Servlets and JSP, 2nd Edition, Bryan Basham, Kathy Sierra and Bert Bates, O'Reilly Media, 2008
3. Core Java Volume II: Advanced Features, Cay Horstmann and Gary Cornell, 9th Edition, Prentice Hall, 2013 (Only Chapter 4 for Database Programming)

References:

1. E-resource: http://www.w3schools.com/
2. Core Servlets and JSPs: Volume I and II, Martin Hall and Larry Brown, Pearson

38301
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to all branches)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Course Objectives:

1. To learn various principles of Managerial Economics and to make them effective business decision makers
2. To make the students understand functional areas and potential problems in economics for efficient utilization of resources
3. To have an overview on investment appraisal methods and to promote the students to learn how to start new enterprises
4. To understand the basic elements involved in Capital budgeting process
5. To provide fundamental knowledge of accounting statements & analysis for effective business decisions

Unit I – Introduction to Managerial Economics, Demand and Demand Forecasting

Definition, Nature and Scope of Managerial Economics, Demand Analysis-Demand Determinants, Law of Demand and its exceptions, Elasticity of Demand-Definition, Types, Measurement and Significance of Elasticity of Demand, Introduction to Demand Forecasting Methods-Meaning, Factors Governing Demand Forecasting, Methods of Demand Forecasting (Statistical and Survey Methods).

Unit II - Theory of Production and Cost Analysis

Production Function-Isoquants and Isocosts, Marginal Rate of Technical Substitution, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale, Break-Even Analysis (BEA)-Determination of Break Even Point (simple problems), Managerial Significance and Limitations of BEA.

Unit III – Market Structures

Market structures-Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Price-Output Determination in case of Perfect Competition and Monopoly, Pricing Strategies

Unit IV - Capital Budgeting

Capital and its significance- Types of Capital, Working Capital, Nature and Scope of Capital Budgeting- Features of Capital Budgeting Proposals, Methods of Capital Investment Appraisal Techniques- Payback Period (PBP) Method, Accounting Rate of Return (ARR), Net Present Value (NPV) Method and Internal Rate of Return (IRR), Profitability Index

Unit V – Preparation of Financial Statements and Ratio Analysis

Introduction to Financial Accounting – Accounting principles – Accounting cycle – Journal, Ledger, Trial balance and Final Accounts. Financial Analysis Through Ratios- Computation, Analysis and Interpretation of Liquidity Ratios (Current and Quick Ratios), Activity Ratios (Inventory Turnover Ratio and Debtors Turnover Ratio), and Profitability Ratios (Gross Profit Ratio-Net Profit Ratio-Operating Profit Ratio – P/E Ratio and EPS), Leverage Ratio (Debt-Equity Ratio).

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Capable of analyzing fundamentals of economics such as demand, production, price, supply concepts etc., which helps in effective business administration
CO 2	:	Analyze economies of scale and the Break-Even Point
CO 3	:	Able to determine the Price-Output Relationship in different market Structures

CO 4 : Analyze how to invest adequate amount of capital in order to get maximum return from selected business activity

CO 5 : Analyze accounting statements like income & expenditure statement, balance sheet to understand financial performance of the business and to initiate the appropriate decisions to run the business profitably

Text Books:

1. Financial Accounting, V.Rajasekaran and R.Lalitha, Pearson Education, 2010.
2. Managerial Economics, Suma Damodaran, Oxford University Press, 2009.

References:

1. Managerial Economics, Varshney and Maheswari, 2nd Edition, Sultan Chand & Co, 2009.
2. Managerial Economics in a Global Economy, Dominick Salvatore, 4th Edition, Cengage, 2009.
3. Financial Accounting for Management: Text & Cases, Subhash Sharma and M. Panduranga Vittal, Macmillan, 2008.
4. Financial Accounting, S. N. Maheswari and S. K. Maheswari, Vikas, 2008.
5. Managerial Economics and Financial Analysis, A. R. Aryasri, Tata McGraw-Hill, 2011.

35301

OPERATING SYSTEMS

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Prerequisites: Computer Organization

Course Objectives:

1. To acquire knowledge on basic concepts, principles, functions of operating systems and to demonstrate different process scheduling, synchronization, and deadlock algorithms, in multiprogramming and multiuser environment for conflict free utilization of resources.
2. To learn different memory management techniques and implementation mechanisms for efficient use of memory.
3. To gain knowledge about secondary storage structures, file systems and their implementation for storing and accessing programs and data in optimized manner.
4. To understand different protection and security threats to computer resources and mechanisms to overcome them.

Unit I - Operating System Overview, Process Management

Operating System Overview: Operating system functions and services, Overview of computer operating systems, distributed and special purpose systems, Systems calls and system programs, Operating system structure.
Process Management: Process concepts, Threads, scheduling-criteria, Scheduling algorithms (FCFS, SJF, Priority), Scheduling algorithms (RR, Multilevel queue, Multilevel feedback queue),
Case studies: Linux and Windows- Design principles, process scheduling

Unit II – Synchronization, Deadlocks

Synchronization: The critical- section problem and Peterson's solution, Synchronization hardware, Semaphores, Classic problems of synchronization, Monitors.
Deadlocks: Deadlock characterization, Deadlock prevention, Deadlock avoidance (Banker's algorithm), Deadlock detection and recovery
Case studies: Linux and Windows-Synchronization

Unit III - Memory-Management Strategies, Virtual-Memory Management

Memory-Management Strategies: Contiguous memory allocation, Paging, Structure of the page table, Segmentation.
Virtual-Memory Management: Virtual memory and demand paging, Introduction to page replacement & page-replacement algorithms (FIFO, Optimal). (LRU, LRU variations, Counting based), Allocation of frames and thrashing.
Case studies: Linux and Windows -Memory management.

Unit IV - File System, System Implementation, Mass-Storage Structure

File System: The concept of a file and access methods, Directory structure, File sharing and protection.
File System Implementation: File system structure, file system implementation and directory implementation. Allocation methods, Free-space management, efficiency and performance
Mass-Storage Structure: Overview of mass-storage structure, Disk scheduling, RAID structure
Case studies: Linux and Windows - File system

Unit V - I/O Systems, Protection, Security

I/O Systems: I/O hardware, Application I/O interface, kernel I/O subsystem.
Protection: Goals and principles of protection, domain of protection access matrix. Implementation of access matrix, revocation of access rights.

Security: The Security problem, program threats, system and network threats. Cryptography as a security tool. User authentication, implementing security defenses. Firewalling to protect systems and networks, computer – security classifications.
Case studies: Linux and Windows- Security

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

CO 1	:	Acquire basic knowledge about different functions, structures and design features of contemporary operating systems
CO 2	:	Classify, implement and demonstrate different process scheduling, Synchronization, and deadlock related algorithms.
CO 3	:	Differentiate different memory management techniques and their implementations
CO 4	:	Demonstrate secondary storage structures, file systems and directory structures and their implementations.
CO 5	:	Identify the protection and security threats and mechanisms to overcome them.
CO 6	:	Solve numerical problems on concurrency issues such as deadlocks and synchronization.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin and Greg Gagne, 8th Edition, John Wiley, 2008.
2. Operating Systems- A Concept Based Approach, D.M.Dhamdhere, 3rd Edition, TMH, 2009.

References:

1. Operating Systems, Internals and Design Principles, William Stallings, 6th Edition, Pearson Education, 2009.
2. Modern Operating Systems, Andrew S Tanenbaum, 2nd Edition, PHI, 2008.
3. Operating Systems, A.S. Godbole, 2nd Edition, TMH, 2008.

35302

DATA COMMUNICATIONS AND COMPUTER NETWORKS

Instruction	:	4 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	4	End Exam Duration	:	3 Hours

Prerequisites: Operating Systems, Algorithms

Course Objectives:

1. To learn the basic concepts of data communications and computer networking models in wide sense.
2. Pre-requisite knowledge to enable students to study more advanced topics in computer networking.

Unit I - Introduction

Introduction: Data communication ,Networks, The internet, Protocols and standards, Networks Models: The OSI Model, TCP/IP protocol Suite, Addressing, Physical Layer and Media: Data and signals, Digital transmission, Analog transmission, Transmission Media, Switching: Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks.

Unit II – Data Link Layer

Data Link Layer: Introduction, Blocking Coding, Cyclic Codes, Checksum, Data Link Control: Framing, Flow and Error Control protocols, Noiseless Channels, Noisy channels, HDLC, Point-to-Point Protocol, Multiple Access, IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet. Connecting Devices.

Unit III – Network Layer

Network Layer: Logical Addressing, Internet Protocol, Address Mapping, ICMPv4, Delivery Forwarding and Routing: Unicast Routing Protocols, Multicast Routing Protocols.

Unit IV – Transport Layer

Transport Layer: Process-Process Delivery: UDP, TCP
Congestion Control and Quality of Service: Data Traffic, Congestion, Congestion Control, Example (TCP), Quality of Service, Techniques to improve QoS.

Unit V – Application Layer

Application Layer: Domain Name System, Remote Logging, Electronics Mail, File Transfer protocol, WWW and HTTP, Voice over IP, Network Management: SNMP.

Suggested: **Two Day Workshop on CISCO Packet Tracer**

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

CO 1	:	Master the basics of data communications.
CO 2	:	Become familiar with various types of networks.
CO 3	:	Select components and network topology for particular application.
CO 4	:	Have experience in designing communication protocols.
CO 5	:	Have a good understanding of how the underlying networks work, their technical features, and what kinds of applications they can support.
CO 6	:	Identify the protocols and services of transport layer.
CO 7	:	Be well exposed to TCP/IP protocol suite.

Text Books:

1. Data Communications and Networking, Behrouz A.Forouzan, 4th Edition, TMH, 2009.
2. Computer Networks, A.S.Tanenbaum, 4th Edition, Pearson Education, 2008.

References:

1. Computer Networking: A Top-Down Approach, Games F. Kurose and K.W.Ross, 7th Edition, Pearson Education, 2017.
2. Introduction To Data Communications And Networking, W. Tomasi, Pearson Education, 2009.
3. Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education, 2008.

37331

WEB TECHNOLOGIES LAB
(Common to CSE & IT)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:		End Exam Marks	:	70
Credits	:	2	End Exam Duration	:	3 Hours

Course Objectives:

1. To learn the basics of HTML elements
2. To learn the basics of java Console and GUI based programming
3. To introduce XML and processing of XML Data with Java
4. To introduce Server side programming with Java Servlets and JSP
5. To introduce Client side scripting with JavaScript and AJAX.

List of Programs:

Week 1: Working with Static web pages.

Develop static web pages (using only HTML) of an online Book store. Make your own assumptions regarding the contents. The website should consist: Home page, Registration page , Login page, User profile page, Books catalog display, Order page, Payment page and so on..

Week 2: Enhancement of previous week job.

Adding different styles to the web pages created in the previous week and enhancing the usability using CSS.

Week 3: Working with Java Script and Regular Expressions

Validate the registration, user login, user profile and payment pages using JavaScript.
Make use of any needed JavaScript objects.

Week 4: Improvise the pages by introducing DOM.

Access and modify the webpage elements using DOM API

Week 5: Working with XML

Write an XML file which will display the Book information with the following fields: Title of the book, Author Name, ISBN number, Publisher name, Edition, Price

Working with DTDs (Validating XML document)

Define a Document Type Definition (DTD) and XML schema to validate the above created XML Documents

Week 6: Working with XSLT

Display the above XML file as follows: The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose.

Week 7: Developing JDBC based Applications

- Write a java program to establish a connection to a database and execute simple SQL queries.
- Write a java program to demonstrate the usage of JDBC in performing various DML statements. Use prepared statements and callable statements.

Week 8:

- Write a java based application to demonstrate the Updatable and Scrollable result sets.
- Write a java program to access meta data of the SQL database.

Week 9:

- Write a program to accept request parameters from a form and generate the response.
- Write a program to accept ServletConfig and ServletContext parameters.

Week 10:

Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and, pwd4 respectively. Write a servlet for doing the following functionalities
- Create a Cookie and add these four user ids and passwords to this Cookie.
- Read the user id and password entered into the Login form and authenticate with the values (user id and passwords) available in the cookies. If the person is a valid user (i.e., user-name and password match) you should welcome by name (user-name) else you should display the message " You are not an authenticated user ".

Week 11:

- Develop a servlet to demonstrate the database access and update from a database.
- Create a servlet to implement an authentication filter mechanism.
- Develop a servlet to implement servlet context and session listeners.

Week 12:
Working with JSP

Write a JSP which does the following job:
- Insert the details of the three users who register with the web site by using registration form.
- Authenticate the user when he submits the login form using the user name and password from the database.

Week 13:

Write a JSP to demonstrate the usage of JSP standard actions.
Write a JSP to show the usage of various scripting elements.

Week 14:

Write a JSP to illustrate the Features of Expression Language.
Design and use a custom tag library.

Week 15:

Design a simple application using both Servlets and JSPs along with database access.

Course Outcomes: At the end of the course, the student should be able to

CO 1: Able to write html, CSS codes.
CO 2: Demonstrate JavaScript, XML, DHTML and related Technologies.
CO 3: Implement the Database Connectivity and Component Technologies like Beans
CO 4: Deploy the servlet technology & API
CO 5: Construct the fundamentals of JSP, EL (Expression Language).

38331

ADVANCED ENGLISH COMMUNICATION & SOFT SKILLS LAB
(Common to all Branches)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:		End Exam Marks	:	70
Credits	:	2	End Exam Duration	:	3 Hours

Course Objectives:

1. To equip the students with the requisite employability skills for empowerment in the globalized context.
2. The course enables them to develop their holistic communication and soft skills both for their professional and interpersonal communication in the contemporary scenario.

Syllabus:

1. Effective Communication
2. Teleconferencing
3. Video Conferencing
4. Conceptual Introduction to Soft Skills
5. Negotiation Skills
6. Group Discussion
7. Decision Making and Problem Solving
8. Interpersonal/ Intrapersonal Skills
9. Team building
10. Time Management
11. Presentation Skills
12. Book Review

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Evolve as effective communicators
CO 2	:	Emerge as decision makers, time managers and good negotiators
CO 3	:	Develop holistic soft skills
CO 4	:	Develop critical and analytical skills
CO 5	:	Present their skills confidently in the job market
CO 6	:	Gather ideas and information, and organize them relevantly and coherently
CO 7	:	Develop leadership and team building skills

References:

1. A Course in English Communication, Madhav Apte, Prentice-Hall of India, 2007.
2. Body Language: Your Success Mantra, Dr. Shalini Verma, S. Chand, 2000.
3. Communication Skills for Engineers, Sunita Mishra and C. Murali Krishna, Pearson Education, 2007.
4. Objective English, Edgar Thorpe and Showick Thorpe, 2nd Ed., Pearson Education, 2007.
5. Technical Communication: Principles and Practice, 3rd Ed., Meenakshi Raman and Sangeeta Sharma, Oxford University Press, 2015.
6. Soft Skills and Life Skills: The Dynamics of Success, Bhasker Reddi and Nishitesh, BSC Publishers & Distributors, 2012.

35331

HANDS ON MOBILE APPLICATION DEVELOPMENT WITH ANDORID

Instruction	:	3 Periods / week		Sessional Marks	:	30
Tutorial	:			End Exam Marks	:	70
Credits	:	2		End Exam Duration	:	3 Hours

Course Objectives:

1. To resolve the technical challenges posed by current mobile devices and wireless communications; be able to evaluate and select appropriate solutions
2. To design and implement the components of an Android application
3. To publish the application and understand the economics and features of the app marketplace by offering the app for download.

List of Experiments:

1. Create "Hello World" application which displays **Hello World** in the middle of the screen in the red color with white background.
2. To understand Activity and Intent
   - Create sample application with login module. (Check username and password)
   - On successful login, go to next screen, and on failing login, alert user using Toast.
   - Also pass username to next screen
3. Create login application where you will have to validate EmailID (Username) till the username and password is not validated, login button should remain disabled.
4. Create a login application as above and on successful login, open browser with any URL.
5. Demonstrate the concept of passing data through intents by developing an application.
6. Understand resource folders:
   - Create spinner with strings taken from resource folder (res/values)
   - On changing spinner value, change image.
7. Implement menu options.
   - Create an application that will change color of the screen based on selected options from menu.
8. Demonstrate the process of displaying toast (message) on specific interval of time.
9. Implement a background application that will open activity on specific time.
10. Demonstrate the use of shared preferences object by developing an application to set foreground color and background color of a screen.
11. Comprehend UI:
    - Develop a UI that displays list of all types of cars in first screen.
    - On selecting a car name, next screen should show car details like name, launched date, company name, images(using gallery) if available, show different colors in which it is available.
12. Demonstrate content providers and permissions.
    - Read phonebook contacts using content providers and display in list.
13. Analyse android messaging system and write an application that reads messages from the mobile and displays it on the screen.
14. Implement an application to call specific entered number by user in an EditText
15. Understand user defined content providers and apply them to create an application that will implement books store.
16. Develop an application that demonstrates reading files from asset folder and copying into memory card.
17. Create an application that will play a media file from the memory card.
18. Create an application to make insert, update, delete and retrieve operations on database.
19. Demonstrate the process of reading file from sd card and displaying file content on the screen.
20. Implement an application that draws line on the screen as user drags his finger.
21. Create an application to send a message between two emulators.

22. Demonstrate the process of taking a picture using native application.
23. Comprehend the Image views and develop an application to pick up any image from the native application gallery and display it on the screen.
24. Create an application to open any URL inside the application and clicking on any link from that URI should not open Native browser but that URL should open in the same screen.

Course Outcomes: At the end of the course, the student should be able to

CO 1 : Comprehend the role of Activities in Android applications and develop apps using two or more activities
CO 2 : Develop Layouts and views in android using sample applications
CO 3 : Demonstrate the ways of storing data persistently in Android using databases, shared preferences and files
CO 4 : Comprehend the scheme of messaging and networking in android and develop apps using it.
CO 5 : Appreciate and apply content providers for sharing data between applications.

Text Books:

1. Beginning Android 4 Application Development, Wei-Meng Lee, Wrox Publications, 2012.
2. Android Wireless Application Development. Shae Conder and Lauren Darcey, 2nd Edition, Addison-Wesley Professional, 2012.

Reference:

1. Professional Android 4 Application Development, Reto Meier, Wrox, 2012.

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EFFECTIVE TECHNICAL COMMUNICATION LAB
(Common to all Branches)

Instruction	:	2 Periods / week	Sessional Marks	:	30
Tutorial	:		End Exam Marks	:	70
Credits	:	1	End Exam Duration	:	3 Hours

Course Objectives:

1. To equip students with essentials of Technical writing for Professional Communication
2. To familiarize students with different reading strategies and writing formats used in the industry
3. To inculcate ability to customize English language to meet the desired results

Syllabus: The following topics will be covered

1. Features of Technical Communication
2. Reading Process and Strategies
3. Note making
4. Summarising and Paraphrasing
5. Creative Essay Writing
6. E-mail Writing
7. Report Writing
8. Case Studies

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

CO 1	:	Attain proficiency in technical writing
CO 2	:	Use English language appropriately to write effective reports, notes and summaries
CO 3	:	Write emails suitable for professional communication
CO 4	:	Develop analytical and critical thinking skills

Text Books:

1. Effective Technical Communication, M. Ashraf Rizvi, McGraw-Hill Education (India) Private Limited, 2005.
2. Communication Skills for Engineers, Sunita Mishra and C. Murali Krishna, Pearson Education, 2007.

References:

1. Creative English for Communication, N. Krishnaswamy and T. Sriraman, Macmillan Publishers India Ltd., 2011.
2. Handbook of Technical Writing, David, A. Mcmurrey and Joanna Buckley, Thomson Press (India) Ltd, 2012.
3. Contemporary Business Communication, Scot Ober, 7th Edition, Houghton Mifflin, 2007.

35332

CASE TOOLS LAB
(Common to CSE & IT)

Practical	:	3 Periods / week	Sessional Marks	:	30
			End Exam Marks	:	70
Credits	:	2	End Exam Duration	:	3 Hours

Course Objectives:

1. Understand how UML supports the entire OOAD process.
2. Become familiar with all phases of OOAD.

Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, State chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notations.

1. **ATM Case Study**

   i.   Use Case diagram for ATM system, with use case specification.
   ii. Identify the classes for the ATM system and draw the Class Diagram.
   iii. Draw the Sequence and Collaboration diagrams for each of the use cases identified.
   iv. Draw the State Chart Diagram for the above system.
   v.   Draw the Activity Diagram for the system.
   vi. Draw the Component Diagram for the system.
   vii. Draw the Deployment Diagram for the system.
   viii. Forward and Reverse engineering the system

2. **Online Railway Reservation System**

   i.   Use Case diagram for ATM system, with use case specification.
   ii. Identify the classes for the ATM system and draw the Class Diagram.
   iii. Draw the Sequence and Collaboration diagrams for each of the use cases identified.
   iv. Draw the State Chart Diagram for the above system.
   v.   Draw the Activity Diagram for the system.
   vi. Draw the Component Diagram for the system.
   vii. Draw the Deployment Diagram for the system.
   viii. Forward and Reverse engineering the system

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Understand the history, cost of using and building CASE tools.
CO 2	:	Construct and evaluate hybrid CASE tools by integrating existing tools.
CO 3	:	Deliver the product with quality.

35303/35351

SOFTWARE ENGINEERING
(Common to CSE & IT)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period/ week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Prerequisites: Object Oriented Programming through Java

Course Objectives:

1. This course helps to understand theories, methods, and technologies applied for professional software development.
2. To define software engineering and explain its importance
3. To discuss the concepts of software products and software processes

Unit I – Introduction to Software Engineering, Process Models

Introduction to Software Engineering: The evolving role of software, Software, Changing Nature of Software, Legacy software, Software evolution, Software myths, Software engineering- A layered technology.
Process models: A process framework, the waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process. Personal and Team process models, The Capability Maturity Model Integration (CMMI)

Unit II – System Engineering, Requirements Engineering, Building the Analysis Model

System Engineering: An Overview of Business Process Engineering and Product Engineering.
Requirements Engineering: Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-Cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.
Building the Analysis Model: Requirements analysis, Analysis Modeling Approaches, Data Modeling Concepts, Object-Oriented Analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Based Modeling, Creating a Behavioral Model,

Unit III – Design Engineering, Creating an Architectural Design, Modelling Component level design

Design Engineering: Design process and Design quality, Design concepts, the design model, Pattern based software design.
Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design, Assessing alternative architectural designs, mapping data flow into software architecture.
Modeling component-level design: Designing class-based components, conducting component-level design, Object constraint language, Designing conventional components.

Unit IV – Performing User Interface Design, Testing Strategies

Performing User interface design: Golden rules, User interface analysis and design, Interface analysis, Interface design steps, Design evaluation.
Testing Strategies: A strategic approach to software testing, Test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Unit V - Umbrella Activities

Umbrella Activities-I
Measurement: Software Measurement, Metrics for software quality.
Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Umbrella Activities-II

Risk management: Reactive vs. Proactive Risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

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

CO 1 : Understand the principles of software engineering and software myths.
CO 2 : Know the usage of process models and CMMI levels.
CO 3 : Identify requirements engineering process and related system models.
CO 4 : Perceive software design process, design quality, design models and will be able to create architectural designs, component designs and UI designs.
CO 5 : Appreciate the strategic approach to testing and will be able to apply the art of debugging.
CO 6 : Understand the importance of software metrics in ensuring quality and will have the ability to apply them in a given context.

Text Book:

1. Software Engineering, A Practitioner's Approach, Roger S. Pressman, 6th Edition, McGraw-Hill, 2005.

References:

1. Software Engineering, Ian Sommerville, 7th Edition, Pearson Education, 2004
2. Software Engineering: A Precise Approach, Pankaj Jalote, 1st Edition, Wiley India, 2010.
3. Software Engineering: A Primer, Waman S Jawadekar, 1st Edition, Tata McGraw-Hill, 2008.
4. Fundamentals of Software Engineering, Rajib Mall, 3rd Edition, PHI, 2009.

34359

MICROPROCESSOR AND INTERFACING

Instruction	:	4 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	4	End Exam Duration	:	3 Hours

Course Objectives:

1. To learn and understand Architecture and Programming of 8086.
2. To learn and understand different Peripherals Interfacing with 8086.
3. To learn and understand the development of Microprocessor based system.

Unit I - 8086 Architecture

8086 Architecture: An Overview of 8085, 8086 Architecture–Functional Diagram, Register Organization, Memory Segmentation, Addressing Modes 0f 8086, Instruction Set of 8086, Assembler Directives, Macros, Procedures.

Unit II - Assembly Language Programming of 8086

Assembly Language Programming of 8086: Simple Programs involving Logical, Branch and Call Instructions, Sorting, Evaluating Arithmetic Expressions ,String manipulations, Signal Descriptions of 8086, Common Function Signals, Minimum and Maximum Mode Signals, Physical Memory Organization, Timing Diagrams.

Unit III - Memory and I/O Interfacing

Memory and I/O Interfacing SRAM Interfacing and DRAM Interfacing, 8255 PPI Architecture, Various Modes of Operation of 8255 and Interfacing with 8086, Displays, Stepper Motor Interfacing, D/A and A/D Converter.

Unit IV - Interrupts and Serial Communication Interface

Interrupts:
Interrupt Structure of 8086, Vector Interrupt Table, Interrupt Service Routine, Interrupt Controller 8259 Architecture and interfacing with 8086. Introduction to DOS and BIOS Interrupts.
Serial Communication Interface
Serial Communication Standards, Serial Data Transfer Schemes, 8251 USART Architecture and Interfacing, RS-232.

Unit V - 8051 Microcontroller

Overview of 8051 Microcontroller: Overview of 8051 Microcontroller, Architecture, I/O ports, Memory Organization, Addressing Modes and Instruction Set of 8051, Simple Programs.

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Write assembly level language programs for different application using assembler.
CO 2	:	Interface the processor with peripheral devices.
CO 3	:	Describe the instruction set and addressing modes of 8086 and 8051
CO 4	:	Understand the 8051 architecture and programming
CO 5	:	Understand the architectural difference between the processor and controllers

Text Books:

1. Advanced Microprocessors and Peripherals, A. K. Ray and K. M. Bhurchandani, 2nd Edition, Tata McGraw-Hill, 2006.
2. Microprocessor and Interfacing, D.V. Hall, 2nd Edition, Tata McGraw-Hill, 2006.
3. The 8051 Microcontroller, Kenneth J. Ayala, 3rd Edition, Cengage Learning, 2010.

References:

1. The 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi and Janice Gillispie Mazidi, 2nd Edition, Pearson, 2008.
2. Micro Computer system: 8086/8088 Family Architecture, Programming and Design, Liu and G. A. Gibson, 2nd Edition, Prentice Hall, 1986.
3. Microcontrollers and Applications, Ajay V. Deshmukh, Tata McGraw-Hill, 2005.

35352

VISUAL PROGRAMMING USING C# AND .NET

Instruction	:	4 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	4	End Exam Duration	:	3 Hours

Prerequisites: Object Oriented Programming through Java

Course Objectives:

1. Realize the elements of the .NET Framework
2. Understand the basics of object oriented programming
3. Work effectively with Visual Studio.NET
4. Develop applications for the .NET Framework using C#
5. Use C# debugging techniques
6. Deploy C# Applications

Unit I – Introduction to .NET Framework and Visual Studio.NET

Introduction to .NET Framework– The .Net Framework, C# language.
Visual Studio.NET- using the Visual Studio IDE.C# Language and Syntax – Data Types, Variables, Constants, Operators, Casting, Control Structures, Conditionals, Loops, Namespaces, Preprocessor Directives, Keywords, Strings and Regular Expressions.

Unit II – Overview of Object Oriented Programming for C#

Overview of Object-Oriented Programming for C# – Classes and Objects – Constructing and Initializing objects, Properties, Methods and Constructors, Parameter Passing to Methods and Constructors, Abstraction, Encapsulation, Static fields and methods. Inheritance – Overview, Controlling accessibility, Overloading, Method Hiding. Interfaces – Overview, Using .NET provided interfaces, Writing and using your own interfaces. Polymorphism – Overview, Dynamic vs. Static Binding, Abstract Classes, Generics – Generic Features, Generic Methods, Arrays and Tuples, Delegates and Events.

Unit III – Reflection, Web application Development

Reflection, Assemblies – Features, Structure, Types – Shared and Private, Networking – Utility Classes, Low – Level Protocols, Localization.
Web Application Development – Getting Started with ASP.NET 4.5.1, Building ASP.NET Website, Designing your Webpage, Working with ASP.NET Server Controls-Types.

Unit IV – Creating consisting looking websites, Databases, LINQ

Creating consisting looking websites – Master Page, Content Page, Page Life cycle, Navigation – Navigation Controls, Routing & Redirection, Validating User Input, Processing data at server
Databases – Installation of Server 2012, Retrieving and manipulating data with SQL,
LINQ – Language Integrated Query.

Unit V – ADO.NET

ADO.NET – Overview of ADO.NET, Evolution from ADO, Concepts, Using Database Connections. Working with Stored Procedures, Data Reader.
Managing Data and Relationships, **Datasets** – Structure, Using a Datasets, Typed Datasets. Populating the Datasets, Persisting Dataset changes.
Deploying the website –Preparing for deployment, Running under IIS.

Course Outcomes: At the end of the course, the student should be able to

CO 1: Create Object Oriented Programs using C#
CO 2: Develop complex classes including class events, properties and overloading

CO 3: Understand terminology and providers associated with ADO.NET
CO 4: Build database applications using ADO.NET
CO 5: Understand the Language Integrated Query (Linq) library

Text Books:

1. Professional C# 5.0 and .NET 4.5.1, Christian Nagel, Jay Glynn and Morgan Skinner, John Wiley & Sons Inc.
2. Beginning ASP.net 4.5.1 in C# and VB, Imar Spaanjaars, Wrox Publication, 2014.

References:

1. Microsoft Visual C# Step by Step, John Sharp, O'Reilly Media, Inc., 2013.
2. A Tester's Guide to .NET Programming, Randal Root and Mary Romero Sweeney, Apress.

35353

INTRODUCTION TO ANALYTICS
(Professional Elective – I)
(Common to CSE & IT)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Prerequisites: Design and Analysis of Algorithms

Course Objectives:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of Analytics for Business
3. To introduce the tools, techniques and programming languages which are used in day to day analytics cycle

Unit I – Introduction to Analytics and R Programming

Introduction to Analytics and R programming : Introduction to R, RStudio, R Windows Environment, Introduction to various data types: numeric, character, date, data frame, array, matrix, etc., Reading datasets, Working with different file types such as .txt, .csv, etc., Outliers, Combining datasets, R functions and loops.
Managing your work to meet requirements
Understanding learning objectives, Introduction to work and meeting requirements, Time management, Work management and prioritization, Quality and Standards adherence.

Unit II – Summarizing data & Revisiting probability

Summarizing data & revisiting probability: Summary Statistics – Summarizing data with R, Probability, Expected, Random, Bivariate random variables, Probability distribution, Central Limit Theorem, etc.
Work effectively with colleagues:
Introduction to working effectively, Team work, Professionalism, Effective communication skills, etc.

Unit III – SQL using R

SQL using R: Introduction to NoSQL, Connecting R to NoSQL databases, Excel and R integration with R connector.

Unit IV – Correlation and Regression Analysis

Regression Analysis: Regression Analysis, Assumptions of OLS Regression, Regression modelling.
Correlation: ANOVA, Forecasting, Heteroscedasticity, Autocorrelation, Introduction to multiple regression etc.

Unit V – Understanding the Verticals – Engineering, Financial and Others

Understanding the Verticals – Engineering, Financial and Others: Understanding the systems viz. Engineering Design, Manufacturing, Smart Utilities, Production Lines, Automotive, Technology, etc., Understanding business problems related to various businesses
Requirements Gathering: Gathering all the data related to the business objective

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Acquire an understanding of fundamental programming/data structures in R.
CO 2	:	Develop an ability to choose among vectors, matrices and frames for processing real-world data
CO 3	:	Understand the various dynamics of working on projects in various verticals.
CO 4	:	Depict data in various graphical forms for better data visualization.
CO 5	:	Understand the application of statistical techniques

Text Book:

1. Student's Handbook for Associate Analytics. NASSCOM.

References:

1. Introduction to Probability and Statistics Using R, G. Jay Kerns.
2. An Introduction to R, W N Venables, D M Smith and the R Development Core Team (http://www.r-project.org).
3. Applied Statistics and Probability for Engineers, Montgomery, Douglas C and George C. Runger, John Wiley & Sons, 2010.
4. The Basic Concepts of Time Series Analysis and Mining with R, Yanchang Zhao.

35354

COMPUTER GRAPHICS
(Professional Elective – I)
(Common to CSE & IT)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Prerequisites: Computer Organization

Course Objectives:

1. To provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
2. A thorough introduction to computer graphics techniques, focusing on 3D modeling, image synthesis, and rendering., sampling, Monte Carlo path tracing, photon mapping, and anti-aliasing.

Unit I – Overview of Graphics Systems

Overview of Graphics Systems: Application areas of computer graphics Overview of graphics systems, Video display devices, Raster scan Systems, Random scan systems. Points and Lines, Line drawing algorithms, Mid-point Circle and Ellipse algorithms, Filled Area Primitives, Scan line polygon fill algorithm, Boundary fill algorithm, Flood fill algorithm, Implementation of Primitives through WebGL, Line, Circle and Ellipse, Filled Area Primitives

Unit II - Transformations

2-D Geometrical Transformations: Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations and Other Transformations. Transformations between two coordinate systems.
2-D Viewing: The Viewing Pipeline, Viewing coordinate reference frame, Window to view-port coordinate transformation. Cohen Sutherland and Cyrus beck line clipping algorithms, Sutherland –Hodgeman Polygon clipping algorithm

Unit III – 3D Object Representation

3-D Object Representation: Polygon surfaces, Quadratic surfaces, Spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Illumination models and surface rendering methods: Basic Illumination Models, Polygon rendering methods. Hermite, Bezier, and Bezier surfaces

Unit IV – 3D Geometric Transformations

3-D Geometric Transformations: Translation, rotation, scaling, Reflection and shear transformations, Composite transformations. 3-D Viewing: Viewing pipeline, Viewing coordinates, Projections, View volume and general projection transformations, and clipping strategies.

Unit V – Surface Detection Methods

Visible Surface Detection Methods: Classification of Visible –Surface Detection Algorithms, Back-face detection, Depth–buffer, scan-line and depth sorting methods BSP-tree, area sub-division and octree methods.
Computer Animation: Design of Animation sequence, General Computer Animation Functions and Raster animation, Computer Animation Languages, Key frame systems. Motion Specifications: Principles of Animation and Advanced Animation Techniques.

Course Outcomes: At the end of the course, the student should be able to

CO 1 : Realize the application areas of computer graphic systems and output device primitives.
CO 2 : Demonstrate 2D geometric transforms and 2D viewing
CO 3 : Design 3D Object representations, 3D transformations and illumination models.
CO 4 : Learn visible surface detection methods and design framework.
CO 5 : Appreciate different animation techniques for classification.
CO 6 : Design surface contours and able to animate 3D systems.

Text Books:

1. Computer Graphics : C version , Donald Hearn and M.Pauline Baker, Pearson Education, 2008
2. WebGL Programming Guide: Interactive 3D Graphics Programming with Web GL, Kouichi Matsuda and Rodger Lea, Addition-Wesley, 2013.

References:

1. Computer Graphics: Principles and Practice in C, Foley, Van Dam, Feiner and Hughes, 2nd Edition, Pearson Education, 2013
2. Principles of Computer Graphics, Shalini Govil-Pai, Springer-verlag, 2004.
3. Procedural Elements for Computer Graphics, David F Rogers, 2nd Edition, TMH, 2001.
4. Computer Graphics, Steven Harrington, Tata McGraw-Hill, 2001.
5. Principles of Interactive Computer Graphics: Neuman and Sproul, Tata McGraw-Hill.

35355

NETWORK SECURITY
(Professional Elective – I)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Prerequisites: Data Communications and Computer Networks

Course Objectives:

1. Analyze the basic categories of threats to computers and networks
2. Present various cryptographic algorithms.
3. Describe public-key cryptosystem.
4. Discuss Intrusions and intrusion detection
5. Discuss the fundamental ideas of public-key cryptography.

Unit I - Attacks on Computers and Computer Security

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for **Network Security Cryptography:** Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

Unit II – Symmetric and Asymmetric Encryption Algorithms

Symmetric key Ciphers: Block Cipher principles & Algorithms (DES, AES), Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution
Asymmetric key Ciphers: Principles of public key cryptosystems, Algorithms (RSA, Diffie-Hellman), Key Distribution

Unit III – Message Authentication Algorithms

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, Digital signatures, knapsack algorithm Authentication Applications: Kerberos, X.509 Authentication Service, and Public – Key Infrastructure.

Unit IV - E-Mail Security

E-Mail Security: Pretty Good Privacy, S/MIME IP Security: IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, key management

Unit V - Web Security

Web Security: Web security considerations, Secure Socket Layer and, Secure electronic transaction Intruders
Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Firewall design principles, Types of firewalls
Case Studies on Cryptography and security: Secure Inter-branch Payment Transactions.

Course Outcomes: Upon successful completion of the course, a student is able to

CO 1	:	Become familiar with the need for securing data networks against various types of security attacks.
CO 2	:	Exhibit an understanding of the encryption and decryption algorithms.
CO 3	:	Comprehend the authentication mechanisms applicable to various scenarios.
CO 4	:	Design secure solutions using available secure solutions
CO 5	:	Demonstrate the ability to detect and counter virus attacks via firewalls.

Text Books:

1. Cryptography and Network Security , William Stallings, 5th Edition, Pearson Education,
2. Cryptography and Network Security, Atul Kahate, 2nd Edition, McGraw-Hill.
3. Network Security and Cryptography, Bernard Menezes, Cengage Learning

References:

1. Cryptography and Network Security, C. K. Shyamala, N.Harini and Dr. T. R. Padmanabhan, 1st Edition, Wiley India.
2. Cryptography and Network Security, Forouzan and Mukhopadhyay, 2nd Edition , McGraw-Hill,
3. Information Security, Principles and Practice, Mark Stamp, Wiley India.

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INFORMATION SECURITY MANAGEMENT
(Professional Elective – I)
(Common to CSE & IT)

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	1 Period / week	End Exam Marks	:	70
Credits	:	3	End Exam Duration	:	3 Hours

Course Objectives:

1. To introduce the terminology, technology and its applications
2. To introduce the concept of Security Analyst
3. To introduce the tools, technologies& programming languages which is used in day to day security analyst job role.

Unit I - Information Security Management

Information Security Management: Information Security Overview, Threats and Attack Vectors, Types of Attacks, Common Vulnerabilities and Exposures (CVE), Security Attacks, Fundamentals of Information Security, Computer Security Concerns, Information Security Measures etc., Manage your work to meet requirements (NOS 9001).

Unit II – Fundamentals of Information Security

Fundamentals of Information Security: Key Elements of Networks, Logical Elements of Network, Critical Information Characteristics, Information States etc., Work effectively with Colleagues (NOS 9002)*

Unit III – Data Leakage

Data Leakage: What is Data Leakage and statistics, Data Leakage Threats, Reducing the Risk of Data Loss, Key Performance Indicators (KPI), and Database Security etc.,

Unit IV – Information Security Policies, Procedures and Audits

Information Security Policies, Procedures and Audits: Information Security Policies-necessity-key elements & characteristics, Security Policy Implementation, Configuration, Security Standards-Guidelines & Frameworks etc.

Unit V – Information Security Management

Information Security Management Roles and Responsibilities: Security Roles & Responsibilities, Accountability, Roles and Responsibilities of Information Security Management, team-responding to emergency situation-risk analysis process etc.

* NOS: National Occupational Standards

Course Outcomes: At the end of the course, the student should be able to

CO 1	:	Identify and prioritize information assets, threats to information assets.
CO 2	:	Define an information security strategy, architecture, policy and understand its central role in a successful information security program.
CO 3	:	Define risk management and its role in the organization.
CO 4	:	Describe the various access control approaches including authentication, authorization and biometric access controls.
CO 5	:	Respond to intruders in an information system and identify the skills and requirements for information security positions.

Text Book:

1. Management of Information Security, Michael E Whitman and Herbed J Mattord, 2nd Edition, Course Technology, 2007.

References:

1. http//www.iso.org/isolhomelstandardslmanagement-standardsliso27001.htm
2. http//www.licsrc.nistmovlpublicationslnistpubs/800-55-Rev1ISP800-55-revl.pdf

35381

R-PROGRAMMING AND CASE TOOLS LAB

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	2	End Exam Duration	:	3 Hours

Course Objectives:

1. The importance and function of each UML model throughout the process of object-oriented analysis and design
2. Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, State chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notations.

ATM Case Study:

1. Use Case diagram for ATM system, with use case specification.
2. Identify the classes for the ATM system and draw the Class Diagram.
3. Draw the Sequence and Collaboration diagrams for each of the use cases identified.
4. Draw the State Chart Diagram for the above system.
5. Draw the Activity Diagram for the system.
6. Draw the Component Diagram for the system.
7. Draw the Deployment Diagram for the system.
8. Forward and Reverse engineering the system

R Lab Exercises

1. Write a function which searches for a given key in a vector. Write a separate version each using while loop and repeat loop.
2. Write a function to demonstrate recycling of vectors and matrices in R.
3. Create a list containing students' roll numbers and attendance by reading the data from an Excel file. Write a function to display the roll numbers with less than 70% attendance.
4. Write a function that counts the number of occurrences of each word in a text file.
5. Create a data frame using the Chick Weight dataset available in R-Studio. Write a function to depict the time-series analysis of the impact of diet on the weight of chicks.
   - (i) Read the following dataset from the Internet into an appropriately named data frame.
6. http://www.headfirstlabs.com/books/hfda/hfda_ch09_employees.csv
7. Choose a dependent variable and an independent variable from the dataset. Use the linear regression function lm () to compute the regression coefficients.
8. Plot the data and add a regression line to it.
   - (i) Read the Nile dataset into a data frame.
   - (ii) Install lattice package from the Internet.
   - (iii) Create a scatter plot using lattice package.

Course Outcomes for CASE Tools: Upon completion of this course a student is able to

CO 1	:	Understand OO analysis and design skills through an elaborate case study.
CO 2	:	Demonstrate the process of Object Oriented Analysis and Design documents for a given problem using Unified Modeling Language to Draw the UML design diagrams
CO 3	:	Appropriate the activity diagram concept and isolate the design patterns present in an application.
CO 4	:	Appreciate the features of Object Oriented Analysis and Design concepts and apply them to solve problems
CO 5	:	Represent the deployment of the large scale projects.

Course Outcomes for R Programming: Upon completion of this course a student is able to

CO 1	:	Represent the data in R environment
CO 2	:	Render various plots and interpret their significance
CO 3	:	Implement various clustering and classification rules

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VISUAL PROGRAMMING THROUGH C# AND .NET LAB

Instruction	:	3 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	2	End Exam Duration	:	3 Hours

Course Objectives:

1. To provide hands on experience on .Net framework
2. To appreciate the asynchronous event handling feature in .Net
3. To offer end-to-end program model for web application development

List of Experiments:

1. Working with callbacks and delegates in C#: Demonstrates the use of delegates, callbacks, and synchronous and asynchronous method invocation.
2. Using Reflection in C#: Demonstrate how to gather information on various types included in any assembly by using the System.Reflection namespace and some main .NET base classes.
3. Perform String Manipulation with the String Builder and String Classes and C#: Demonstrates some basic string manipulation using both the String Builder and String classes.
4. Sending Mail with SmtpMail in C#: Uses a simple Web form to demonstrate how to use the SmtpMail class in the .NET Framework.
5. Using the System.Net.WebClient to Retrieve or Upload Data with C#: Demonstrate how to create a Windows Form that can use HTTP to download and save a resource from a specified URI, upload a resource to a specified URI, or read and write data through a stream object.
6. Student Management System application development with required details: Use ADO.NET for storing and manipulating the data. Develop the necessary forms for the better user interface.
7. Convert the above application to a web application using ASP.Net and SQL Server.Use IIS to deploy the web application developed in ASP.net.

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

CO 1	:	Create private and shared libraries
CO 2	:	Develop asynchronous applications
CO 3	:	Deploy Web services
CO 4	:	Build database applications using ADO.NET
CO 5	:	Understand the Language Integrated Query (Linq) library

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MICROPROCESSOR AND INTERFACING LAB

Instruction	:	3 Periods / week		Sessional Marks	:	30
Tutorial	:	-		End Exam Marks	:	70
Credits	:	2		End Exam Duration	:	3 Hours

Course Objectives:

1. To familiarize the architecture of 8086 processor, assembly language programming and interfacing with various modules
2. To provide 8051 micro controller architecture, programming for different application

List of Experiments:

The following programs /experiments are to be written for assembler and execute the same with 8086/8051 kits

1. Programs for 16 bit Arithmetic operations for 8086 (using various addressing modes)
2. Program for sum of n natural numbers for 8086.
3. Program for factorial of given number for 8086.
4. Program for smallest number in a given array for 8086.
5. Program for largest number in a given array for 8086.
6. Program for ascending order in a given array for 8086.
7. Program for descending order in a given array for 8086.
8. Program for data transfer from source to destination using (with and without) string instructions for 8086.
9. Program for searching for a number or Character in a string for 8086.
10. Program for string manipulations for 8086.
11. Program for digital clock design using 8086.
12. Interfacing ADC and DAC to 8086.
13. Parallel communication between two microprocessors using 8255.
14. Traffic light controller interfacing with 8086.
15. Serial communication between two microprocessor kits using 8251.
16. Interfacing to 8086 and programming to control stepper motor.
17. Programming using arithmetic, logical and bit manipulation instructions of 8051.

Note: minimum of 12 experiments to be conducted

Course Outcomes: At the end of the lab course, the student should be able to

CO 1	:	Execute different programs for 8086 microprocessor in assembly language using assembler
CO 2	:	Interface various I/O Devices like stepper motor, Key board, ADC, DAC etc. with 8086 microprocessor
CO 3	:	Set up communication between to microprocessors
CO 4	:	Execute programs for 8051 microcontroller using integrated development environment (IDE)

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QUANTITATIVE ABILITY LAB
(Common to all Branches)

Instruction	:	2 Periods / week	Sessional Marks	:	30
Tutorial	:	-	End Exam Marks	:	70
Credits	:	1	End Exam Duration	:	3 Hours

Course Objectives:

1. To introduce arithmetic, mensuration, geometry, averages and clocks and calendars questions
2. To train the students towards preparation of Placement, CAT and GRE etc. tests

Syllabus: Exercises based on the following topics will be conducted

1. Number Systems
2. Percentages
3. Profit and Loss
4. Interest (Simple and Compound)
5. Speed, Time and Distance
6. Time and Work
7. Averages
8. Ratio and Proportions
9. Progressions
10. Inequalities
11. Permutation and Combination
12. Mixtures and Alligations
13. Mensuration
14. Clocks and Calendars
15. Geometry

Course Outcomes: At the end of the course, the student is able to

CO 1	:	Solve the problems using arithmetic, mensuration, geometry, averages & clocks & calendars questions
CO 2	:	Practice general problems in Placement, CAT and GRE etc. tests

Text Books:

1. How to Prepare For Quantitative Aptitude, Arun Sharma, 3rd Ed, Tata-McGraw Hill, 2011
2. Quantitative Aptitude, R S Aggarwal, S Chand & Co., 2012.

References:

1. A Hand book of Test of Reasoning & Quantitative Aptitude, P K Agarwal, S Chand & Co., 2012.
2. Upkar's Quantitative Aptitude Test, N K Singh (Annual Publication)