PAAVAI ENGINEERING COLLEGE, NAMAKKAL – 637 018

(AUTONOMOUS)

B.Tech. INFORMATION TECHNOLOGY

REGULATIONS 2015

CURRICULUM

SEMESTER V

Course Code	Course Title	L	T	P	C
IT15501	Computer Networks	3	0	0	3
IT15502	Object Oriented Analysis and Design	3	0	0	3
IT15503	Internet Programming	3	0	0	3
*******	Elective I	3	0	0	3
CH15501	Environmental Science and Engineering	3	0	0	3
EC15508	Principles of Digital Signal Processing	3	2	0	4
IT15504	Computer Networks and Internet Programming Laboratory	0	0	4	2
IT15505	Case Tools Laboratory	0	0	4	2
EN15501	Career Development Laboratory I	0	0	2	1

SEMESTER VI

Course Code	Course Title	L	T	P	C
IT15601	Compiler Design	3	0	0	3
IT15602	Graphic and Multimedia	3	0	0	3
IT15603	Cryptography and Network Security	3	2	0	4
IT15604	Embedded Systems	3	0	0	3
*******	Elective II	3	0	0	3
BA15254	Principles of Management	3	0	0	3
IT15606	Compiler Design Laboratory	0	0	4	2
IT15607	Graphic and Multimedia Laboratory	0	**0**	4	2
EN15601	Career Development Laboratory II	0	0	2	1

LIST OF ELECTIVES

ELECTIVE I

Course Code	Course Title	L	T	P	C
MA15151	Discrete Mathematics	3	2	0	4
IT15151	Automata Languages and Computation	3	0	0	3
IT15152	Information Coding Techniques	3	0	0	3
IT15153	Software Architecture	3	0	0	3
IT15154	User Interface Design	3	0	0	3

ELECTIVE II

Course Code	Course Title	L	T	P	C
IT15251	Free and Open Source Software	3	0	0	3
IT15252	Distributed Systems	3	0	0	3
BA15351	Engineering Economics and Financial Accounting	3	0	0	3
IT15253	TCP/IP Protocol Design and Implementation	3	0	0	3
IT15254	System Software	3	0	0	3

SEMESTER V

IT15501 COMPUTER NETWORKS 3 0 0 3

COURSE OBJECTIVES

- to understand the division of network functionalities into layers.
- to explain the following terms: computer network, LAN, WAN, MAN, internet, protocol, topology, media, peer-to-peer network, and server based network.
- to be familiar with the components required to build different types of networks.
- to be exposed to the required functionality a teach layer.
- to learn the flow control and congestion control algorithms.

UNIT I FUNDAMENTALS & PHYSICAL LAYER 09

Data communication - Networks - Network models - Layer tasks - The OSI Model - Layers in the OSI model - TCP/IP protocol suit - Data and signals - Transmission media - Switching.

UNIT II DATA LINK LAYER 09

Error detection and correction - Data link control – Framing – HDLC - Multiple access - Wireless LAN's: Standard Ethernet - Fast Ethernet - Gigabit Ethernet - 802.11 - Bluetooth.

UNIT III NETWORK LAYER 09

Logical address (IP4, IP6) - Internet protocol: Internetworking (IP4, IP6) - Transitions from IP4 to IP6 – ICMP –IGMP – Forwarding - Unicasting routing protocol (Distance Vector Routing, Link State Routing) – Multi casting routing protocol.

UNIT IV TRANSPORT LAYER 09

Duties of Transport Layer - UDP – TCP - Congestion control and Quality of Service - Techniques to Improve QoS.

UNIT V APPLICATION LAYER 09

Electronic Mail (SMTP, POP3, IMAP, MIME) - File Transfer Protocol - WWW – HTTP– DNS.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- have a good understanding of the OSI reference model.
- have experience in designing communication protocols.
- analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
- expose TCP/IP protocol suite.
- design and build a network using routers.

TEXT BOOK

1. Behrouz A. Forouzan, "Data Communication and Networking", Fifth Edition, Tata McGraw – Hill, 2012.

REFERENCES

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.
2. James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Fifth Edition, Pearson Education, 2009.
3. Nader. F. Mir, "Computer and Communication Networks", Pearson Prentice Hall Publishers, 2010.
4. William Stallings,"Data and Computer Communication"tenthEdition,Pearson Education, 2014.

WEB LINKS

1. http://nptel.ac.in/courses/106105081/1

2.https://www.tutorialspoint.com/computer_fundamentals/computer_network

CO-PO MAPPING:

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

IT15502 OBJECT ORIENTED ANALYSIS AND DESIGN 3 0 0 3

COURSE OBJECTIVES

- to learn the basics of OO analysis and design skills.
- to learn the UML design diagrams.
- to learn to map design to code.
- to be exposed to the various testing techniques.
- to understand the OO concepts for new projects.

UNIT I UML DIAGRAMS 09

Introduction to OOAD – Unified Process • UML diagrams – Use Case – Class Diagrams – Interaction Diagrams – State Diagrams – Activity Diagrams – Package, component and Deployment Diagrams.

UNIT II DESIGN PATTERNS 09

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller • Design Patterns – creational • factory method • structural – Bridge – Adapter • behavioral – Strategy – observer.

UNIT III CASE STUDY 09

Case study – the Next Gen POS system, Inception • Use case Modeling • Relating Use cases – include, extend and generalization • Elaboration • Domain Models • Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies • Aggregation and Composition.

UNIT IV APPLYING DESIGN PATTERNS 09

System sequence diagrams • Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement • UML class diagrams • UML interaction diagrams • Applying GoF design patterns.

UNIT V CODING AND TESTING 09

Mapping design to code – Testing: Issues in OO Testing – Class Testing – OO Integration Testing – GUI Testing – OO System Testing.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- design and implement projects using OO concepts.
- use the UML analysis and design diagrams.
- Apply appropriate design patterns.
- Create code from design.
- Compare and contrast various testing techniques.

TEXT BOOK

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object•Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.

REFERENCES

1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis andDesignUsingUML", Fourth Edition, Mc•Graw Hill Education, 2010.
2. Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Erich Gamma, and ElementsofReusableObject•Oriented Software", Addison•Wesley, 1995.
3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language",Thirdedition, Addison Wesley, 2003.
4. Paul C. Jorgensen, "Software Testing:• A Craftsman's Approach", Third Edition, AuerbachPublications,Taylor and Francis Group, 2008.

WEB LINKS

1. http://nptel.ac.in/courses/106105153/
2. http://www.tutorialspoint.com/object_oriented_analysis_design/

CO-PO MAPPING:

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

IT15503 INTERNET PROGRAMMING 3 0 0 3

COURSE OBJECTIVES

- to understand different internet technologies.
- to implement client side programs.
- to design and implement server side programs using Servlets and JSP.
- to understand XML.
- to be exposed to java specific web services architecture.

UNIT I WEBSITES BASICS, HTML 5, CSS 3, WEB 2.0 09

Web 2.0 : Basics – RIA Rich Internet Applications – Collaborations tools – Understanding websites and web servers: Understanding Internet – Difference between websites and web server- Internet technologies Overview – Understanding the difference between internet and intranet; HTML and CSS: HTML 5.0 , XHTML, CSS 3.

UNIT II CLIENT SIDE PROGRAMMING 09

Java Script : An introduction to JavaScript – JavaScript DOM Model - Date and Objects - Regular Expressions - Exception Handling – Validation - Built-in objects - Event Handling - DHTML with JavaScript.

UNIT III SERVER SIDE PROGRAMMING 09

Servlets : Java Servlet Architecture - Servlet Life Cycle - Form GET and POST actions - Session Handling- Understanding Cookies - Installing and Configuring Apache Tomcat Web Server. **Database Connectivity:** JDBC perspectives - JDBC program example – JSP: Understanding Java Server Pages-JSP Standard Tag Library (JSTL) - Creating HTML forms by embedding JSP code.

UNIT IV PHP & XML 09

An introduction to PHP : PHP - Using PHP - Variables - Program control- Built-in functions - Connecting to Database – Using Cookies - Regular Expressions. XML: Basic XML - Document Type Definition - XML Schema DOM and Presenting XML - XML Parsers and Validation - XSL and XSLT Transformation - News Feed (RSS and ATOM).

UNIT V INTRODUCTION TO AJAX and WEB SERVICES 09

Client Server Architecture - XML Http Request Object - Call Back Methods. Web Services: Introduction - Java web services Basics – Creating – Publishing - Testing and Describing a Web services (WSDL) - Consuming a web service - Database Driven web service from an application – SOAP.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- create a basic website using HTML and Cascading Style Sheets.
- design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
- design and implement server side programs using servlets and JSP.
- present data in XML format.
- design rich client presentation using AJAX.

TEXT BOOK

1. Deitel and Deitel and Nieto, "Internet and World Wide Web – How to Program", Prentice Hall, 5th Edition, 2011.

REFERENCES

1. Stephen Wynkoop and John Burke "Running a Perfect Website", QUE, 2nd Edition,1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, "Web Technologies A Computer Science Perspective", Pearson Education, 2011.
4. Gopalan N.P. and Akilandeswari J., "Web Technology", Prentice Hall of India, 2011.
5. Uttam K.Roy, "Web Technologies", Oxford University Press, 2011.

WEB LINKS

1. http://nptel.ac.in/courses/106105084/13
2. http://www.cs.ccsu.edu/~stan/classes/CS110/CS110-FA10.html

CO-PO MAPPING:

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

CH 15501 **ENVIRONMENTAL SCIENCE AND ENGINEERING** **3 0 0 3**

(Common to ECE, MCT & IT branches)

COURSE OBJECTIVES

To enable students to

- know the constituents of the environment and the precious resources in the environment.
- conserve all biological resources.
- understand the role of human being in maintaining a clean environment and useful environment for the future generations
- acquire knowledge about ecological balance and preserve bio-diversity.
- understand the role of government and non-government organizations in environment management.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 9

Environment: Definition- scope - importance – need for public awareness. Forest resources: Use –over exploitation- deforestation - case studies- mining - effects on forests and tribal people. Water resources: Use – over utilization of surface and ground water- floods – drought - conflicts over water. Mineral resources-Use – exploitation - environmental effects of extracting and using mineral resources – case studies. Food resources: World food problems - changes caused by agriculture and overgrazing – effects of modern agriculture- fertilizer-pesticide problems - water logging - salinity -case studies. Energy resources-Growing energy needs - renewable and non renewable energy sources. Land resources: Land as resource- land degradation - soil erosion. Role of an individual in conservation of natural resources.

UNIT II ECOSYSTEMS AND BIODIVERSITY 9

Concept of an ecosystem: Structure and function of an ecosystem – producers - consumers –decomposers– energy flow in the ecosystem – ecological succession – food chains - food webs and ecological pyramids. Types of ecosystem: Introduction - characteristic features - forest ecosystem – grassland ecosystem – desert ecosystem - aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Biodiversity: Introduction– definition (genetic - species –ecosystem) diversity. Value of biodiversity: Consumptive use - productive use – social values – ethical values - aesthetic values. Biodiversity level: Global - national - local levels- India as a mega diversity nation- hotspots of biodiversity. Threats to biodiversity Habitat loss - poaching of wildlife – man wildlife conflicts – endangered and endemic species of India

Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity –field study.

UNIT III POLLUTION 9

Pollution: Definition –air pollution - water pollution - soil pollution - marine pollution - noise pollution -thermal pollution – nuclearhazards. Solid waste management: Causes - effects - control measures of urban and industrial wastes. Role of an individual in prevention of pollution - pollution case studies. Disaster management: Floods – earthquake - cyclone- landslides. Electronic waste-Sources-Causes and its effects.

UNIT IV SOCIAL ISSUES AND ENVIRONMENT 9

Sustainable development : Unsustainable to sustainable development – urban problems related to energy. Water conservation - rain water harvesting - watershed management. Resettlement and rehabilitation of people.Environmental ethics: Issues - possible solutions – climate change - global warming and its effects on flora and fauna - acid rain - ozone layer depletion - nuclear accidents - nuclear holocaust - wasteland reclamation. consumerism and waste products. Environment protection act: Air (Prevention and Control of Pollution) act– water (Prevention and control of Pollution) act – wildlife protection act – forest conservation act – issues involved in enforcement of environmental legislation.

UNIT V HUMAN POPULATION AND ENVIRONMENT 9

Human population: Population growth - variation among nations – population explosion – family welfare programme and family planning – environment and human health– Human rights – value education – HIV/ AIDS Swine flu – women and child welfare. Role of information technology in environment and human health.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- explain the relationship between the human population and environment.
- elaborate the basic concepts of environment studies and natural resources.
- gain the knowledge about ecosystem and biodiversity.
- Have knowledge about causes, effects and control measures of various types ofpollution.
- Understand the social issues and various environmentalacts.

TEXT BOOKS

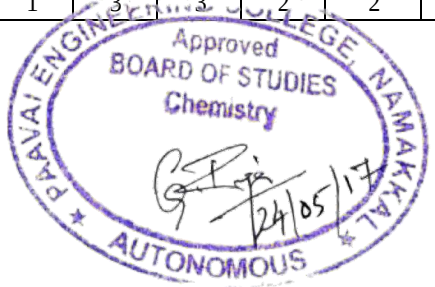
1. Raman Sivakumar, Introduction to Environmental Science and Engineering, 2nd Edn, Tata McGraw Hill Education Private Limited, New Delhi,(2010).
2. Benny Joseph, "Environmental Science and Engineering", Tata McGraw Hill, (2010).

REFERENCES

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad India,2010 .
2. S. Divan, Environmental Law and Policy in India, Oxford UniversityPress, New Delhi, 2001.
3. K.D. Wager, Environmental Management, W.B. Saunders Co., Philadelphia, USA, 1998.
4. W.P. Cunningham, Environmental Encyclopedia, Jaico Publising House, Mumbai, 2004.
5. Clair Nathan Sawyer, Perry L. McCarty, Gene F. Parkin, "Chemistry for Environmental

Mapping of course outcome with Programme Outcomes
(S/M/W indicates strength of correlation) S-Strong-3, M-Medium=2 , W-Weak=1.

CO	Programmes Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	1	3	3	2	-	-	3	1	-
CO2	-	-	2	-	-	1	-	3	-	2	-	3	1	-
CO3	2	-	2	-	2	1	-	3	-	2	-	3	1	-
CO4	2	2	2	-	2	1	3	3	-	2	-	3	1	-
CO5	-	2	-	-	-	1	3	3	2	2	-	2	1	-



EC15508 PRINCIPLES OF DIGITAL SIGNAL PROCESSING 3 2 0 4

COURSE OBJECTIVES

- to introduce signals, systems, time and frequency domain concepts and the associated mathematical tools that are fundamental to all DSP techniques.
- to introduce discrete Fourier transform and its applications.
- to teach the design of infinite and finite impulse response filters for filtering undesired signals.
- to provide a thorough understanding and working knowledge of design, implementation, analysis and comparison of digital filters for processing of discrete time signals.
- to introduce signal processing concepts in systems having more than one sampling frequency

UNIT I SIGNALS AND SYSTEMS 15

Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Convolution

UNIT II FREQUENCY TRANSFORMATIONS 15

Introduction to DFT – Properties of DFT – Circular Convolution - Filtering methods based on DFT – FFT Algorithms - Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering.

UNIT III IIR FILTER DESIGN 15

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance - Bilinear transformation, Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation.

UNIT IV FIR FILTER DESIGN 15

Structures of FIR – Linear phase FIR filter – Fourier Series - Filter design using windowing techniques (Rectangular Window, Hamming Window, Hanning Window), Frequency sampling techniques.

UNIT V FINITE WORD LENGTH EFFECTS IN DIGITAL FILTERS 15

Binary fixed point and floating point number representations – Comparison - Quantization noise truncation and rounding – quantization noise power - input quantization error - coefficient quantization error – limit cycle oscillations - dead band - Overflow error - signal scaling.

TOTAL PERIODS 75

COURSE OUTCOMES

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

- impart the knowledge about continuous and discrete time signals.
- evaluate fourier transform and its properties.
- examine the process of Quantization and the effects of finite Register Length
- implement the appropriate type of design method for FIR filter.

- compare the different types of IIR filter structures.

TEXT BOOK

1. John G. Proakis and DimitrisG.Manolakis, "Digital Signal Processing – Principles, Algorithms &Applications", Fourth Edition, Pearson Education, Prentice Hall, 2007.

REFERENCES

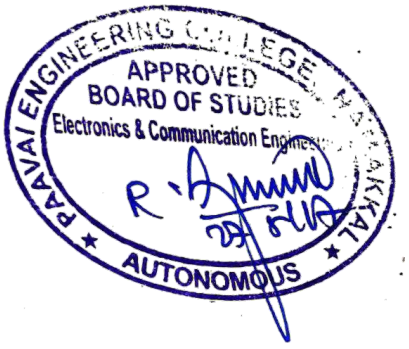
1. Ramesh babu "Digital Signal Processing" Second Edition,2007.
2. Emmanuel C.Ifeachor, and Barrie.W.Jervis, "Digital Signal Processing", Second Edition, Pearson Education, Prentice Hall, 2002.
3. Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Third Edition, Tata McGrawHill, 2007.

WEB LINKS

1. http://nptel.ac.in/courses/108102047/10
2. https://www.allaboutcircuits.com › ... › Digital Signal Processing

CO-PO MAPPING:

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



IT15504 **COMPUTER NETWORKS AND INTERNET PROGRAMMING LABORATORY** **0 0 4 2**

COURSE OBJECTIVES

- to learn socket programming.
- to different algorithms in Network layer.
- to have hands on experience on various networking protocols.
- to be familiar with Web page design using HTML/XML and style sheets.
- to learn to create dynamic web pages using server side scripting.

LIST OF EXPERIMENTS FOR COMPUTER NETWORKS

1. Implementation of Stop and Wait protocol and sliding window protocol..
2. Write a code to simulate ARP protocol.
3. Write a code to simulate RARP protocol.
4. Example applications using TCP sockets.
5. Example applications using UDP sockets.

LIST OF EXPERIMENTS FOR INTERNET PROGRAMMING

1. Create a web page with the following using HTML
    i. To embed a map in a web page.
    ii. To fix the hot spots in that map .
    iii. Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Client side Scripts for Validating Web Form Controls using DHTML .
4. Write programs in Java using sockets to implement the following:
    i. HTTP request
    ii. FTP
    iii. SMTP
    iv. POP3
5. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.

TOTAL PERIODS 60

COURSE OUTCOMES

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

- identify and understand various techniques and modes of transmission.
- describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- design Web pages using HTML/XML and style sheets .
- create dynamic web pages using server side scripting.

RECOMMENDED SYSTEM/SOFTWARE REQUIREMENTS

SOFTWARE: Java, Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server Turbo C, C++.

HARDWARE: Flavor of any WINDOWS or LINUX and Standalone desktops 30 Nos.

CO-PO MAPPING:

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

IT15505 CASE TOOLS LABORATORY 0 0 4 2

COURSE OBJECTIVES

- to learn the basics of object oriented analysis and design skills.
- to be exposed to the UML design diagrams.
- to learn to map design to code.
- to be familiar with the various testing techniques.
- to understand the concepts of program creativity.

LIST OF EXPERIMENTS

TO DEVELOP A MINI-PROJECT BY FOLLOWING THE 9 EXERCISES LISTED BELOW.

1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. Develop and test the User interface layer

SUGGESTED DOMAINS FOR MINI-PROJECT

1. Passport automation system.
2. Book bank.
3. Exam Registration.
4. Stock maintenance system.
5. Online course reservation system.
6. E-ticketing.
7. Software personnel management system.
8. Credit card processing.
9. e-book management system.
10. Recruitment system.
11. Foreign trading system.
12. Conference Management System.
13. BPO Management System.
14. Library Management System.
15. Student Information System.

TOTAL PERIODS 60

COURSE OUTCOMES

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

- design and implement projects using object oriented concepts.
- use the UML analysis and design diagrams.
- apply appropriate design patterns.
- compare and contrast various testing techniques

RECOMMENDED SYSTEM/SOFTWARE REQUIREMENTS

SOFTWARE: Rational Suite (or) Argo UML (or) equivalent, Eclipse IDE and Junit

HARDWARE: Flavor of any WINDOWS and Standalone desktops 30 Nos.

CO-PO MAPPING:

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

EN15501 CAREER DEVELOPMENT LABORATORY I 0 0 2 1

COURSE OBJECTIVES

- to understand their capabilities and enhance their grooming and showcasing his/ her capabilities to a prospective employer
- to provide opportunity for the students to become acquainted with corporate opportunities relevant to their academic learning
- to articulate their thoughts on a given topic – in english and also to make decent write ups in english on any given topic
- to practice & score well in aptitude tests conducted by corporates / prospectiveemployers
- to prepare for any group discussion evaluation or presenting their credentials during a face-to-face interview leading to selection and employment
- to become a knowledgeable person on the various evaluation processes leading to employment.

UNIT I PERSONALITY DEVELOPMENT 1 6

Introduction – self explorations – character building – self esteem - self confidence - positive thinking - leadership qualities - time management.

UNIT II PERSONALITY DEVELOPMENT 2 6

Grooming- Role Play – Good Etiquettes - Extempore - Writing Skills: Email, Paragraph – Team Building - Body Language - Non Verbal Communication.

UNIT III QUANTITATIVE APTITUDE (QA) 1 6

Time, speed & distance -- simple interest & compound interest – percentage – height & distance –time & work – number systems – L.C.M & HCF – ratio proportion- area – directions.

UNIT IV LOGICAL REASONING (LR) 1 6

Analogies - letter and symbol series – number series – cause and effect – essential part – verbal reasoning.

UNIT V VERBAL REASONING (VR) 1 6

Blood relation – venn diagrams – analogy – character puzzles – logical sequence – classification – verification of truth – seating arrangement.

TOTAL PERIODS 30

COURSE OUTCOMES

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

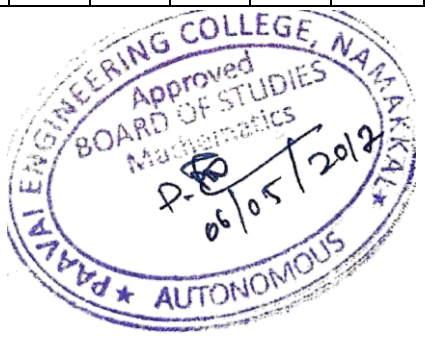
- demonstrate Aptitude & Reasoning Skills
- enhance Verbal & Written Ability.
- improve his/her Grooming and Presentation Skills.
- interact effectively on any recent event/happenings/ current affairs.
- be a knowledgeable person on the various evaluation processes leading to employment and face the same with Confidence.

REFERENCES

1. Agarwal, R.S.” A Modern Approach to Verbal & Non Verbal reasoning”, S.Chand & co ltd, New Delhi.
2. Abhijit guha, “Quantitative Aptitude “, Tata-Mcgraw hill.
3. word power made easy by norman lewis ,W.R.Goyal publications.
4. Johnson, D.W. reaching out – interpersonal effectiveness and self actualization.Boston: Allyn and Bacon.
5. Agarwal, R.S.“ objective general English”,S.Chand & co
6. Infosys campus connect program – students’ guide for soft skills.

CO-PO MAPPING:

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



SEMESTER VI

IT15601 COMPILER DESIGN 3 0 0 3

COURSE OBJECTIVES

- to learn the design principles of a Compiler.
- to learn the various parsing techniques
- to learn different levels of translation.
- to learn how to optimize machine codes
- to learn how to effectively generate machine codes.

UNIT I INTRODUCTION TO COMPILERS 05

Translators - Compilation and Interpretation - Language processors - The Phases of Compiler – Errors Encountered in Different Phases - The Grouping of Phases - Compiler Construction Tools – Programming Language basics.

UNIT II LEXICAL ANALYSIS 09

Need and Role of Lexical Analyzer - Lexical Errors - Expressing Tokens by Regular Expressions- Converting Regular Expression to DFA- Minimization of DFA-Language for Specifying Lexical Analyzers-LEX-Design of Lexical Analyzer for a sample Language.

UNIT III SYNTAX ANALYSIS 10

Need and Role of the Parser-Context Free Grammars - Top Down Parsing -General Strategies- Recursive Descent Parser Predictive Parser -LL(1) Parser-Shift Reduce Parser-LR Parser - LR (0)Item- Construction of SLR Parsing Table - Introduction to LALR Parser – Error Handling and Recovery in Syntax Analyzer-YACC-Design of a syntax Analyzer for a Sample Language.

UNIT IV SYNTAX DIRECTED TRANSLATION & RUN TIME ENVIRONMENT 12

Syntax directed Definitions - Construction of Syntax Tree – Bottom - up Evaluation of S-Attribute Definitions- Design of predictive translator – Type Systems - Specification of a simple type checker- Equivalence of Type Expressions-Type Conversions. RUN-TIME ENVIRONMENT: Source Language Issues - Storage Organization- Storage Allocation - Parameter Passing- Symbol Tables- Dynamic Storage Allocation - Storage Allocation in FORTAN.

UNIT V CODE OPTIMIZATION AND CODE GENERATION 09

Principal Sources of Optimization -DAG - Optimization of Basic Blocks -Global Data Flow Analysis -Efficient Data Flow Algorithms-Issues in Design of a Code Generator – A Simple Code Generator Algorithm.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- design and implement a prototype compiler.

- use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.
- apply the various optimization techniques.
- describe the runtime structures used to represent constructs in typical programming languages.
- use the different compiler construction tools.

TEXT BOOK

1. Alfred V Aho, Monica S. Lam, Ravi Sethi and Jeffrey D Ullman, "Compilers – Principles, Techniques andTools", 2nd Edition, Pearson Education, 2007.

REFERENCES

1. Randy Allen, Ken Kennedy, "Optimizing Compilers for Modern Architectures: A Dependence-based Approach", Morgan Kaufmann Publishers, 2002.
2. Steven S. Muchnick, "Advanced Compiler Design and Implementation, "Morgan Kaufmann Publishers –Elsevier Science, India, Indian Reprint 2003.
3. Keith D Cooper and Linda Torczon, "Engineering a Compiler", Morgan Kaufmann Publishers ElsevierScience, 2004.
4. Charles N. Fischer, Richard. J. LeBlanc, "Crafting a Compiler with C", Pearson Education, 2008.

WEB LINKS

1. nptel.ac.in/courses/106108052/1
2. https://www.tutorialspoint.com/compiler_design/compiler_design_pdf_version.htm

CO-PO MAPPING:

Mapping of Course Outcomes with Programme Outcomes (3/2/1 indicates strength of corelation) 3-Strong,2-Medium,1-Weak														
COs	**Programme Outcomes (POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	3	2	1	-	-	-	-	-	-	1	3	1
CO2	1	2	-	3	-	1	-	-	-	-	-	2	-	2
CO3	3	-	1	3	2	-	-	-	-	-	2	1	-	3
CO4	2	2	-	2	-	-	-	2	-	-	-	-	-	2
CO5	3	1	2	1	3	-	-	1	-	-	-	3	-	3

IT15602 GRAPHICS AND MULTIMEDIA 3 0 0 3

COURSE OBJECTIVES

- to introduce the graphics mode, with the help of basic algorithms and methodologies.
- to equip students with fundamental knowledge and basic technical competence in the field of computer graphics.
- to provide an understanding of how a computer draws the fundamental graphics primitives.
- to learn the implementation of Computer Graphics Algorithms.
- to learn the principles and different components of multimedia. learn the devices and tools for generating and representing multimedia.

UNIT I FUNDAMENTALS 09

Introduction to Computer Graphics - Raster and vector graphics systems - Output primitives - points and lines - line drawing algorithms - loading the frame buffer - line function - circle and ellipse generating algorithms – Pixel addressing and object geometry - filled area primitives - anti-aliasing.

UNIT II 2D-3D REPRESENTATION AND MANIPULATION 09

2D Transformation: Translation, rotation, scaling, reflection and shearing - Matrix and homogeneous coordinates - Composite 2D transformations - 2D Viewing - Clipping : line, polygon and text clipping. 3D Transformation: Translation, rotation, scaling, reflection, shearing -Composite 3D transformation - 3D Viewing - Projection - 3D clipping – Case Study.

UNIT III VISIBLE SURFACE DETECTION AND COLOR MODELS 09

Back face detection - Depth buffer method - A-Buffer method - Scan line method - Depth sorting method - BSP -Tree method - Area Subdivision method - Octree method - Ray casting - Curved surfaces - Wireframe methods - Visibility Detection Functions - Color Models - RGB, CMY, HSV, HLS, CIE models.

UNIT IV INTRODUCTION TO MULTIMEDIA 09

Branch - overlapping Aspects of Multimedia - Content - Global Structure - Multimedia: Media and Data Streams - Medium - Main Properties of a Multimedia System - Traditional Data Stream Characteristics - Data Streams Characteristics for Continuous Media - Information Units - Virtual Reality.

UNIT V AUDIO, VIDEO AND ANIMATION 09

Basic principles of animation - Sound Concepts - Music - Speech - Computer-based Animation - Data Compression - storage Space - Coding Requirements - Source - Entropy and Hybrid Coding - Some Basic Compression Techniques - JPEG, H.261, MPEG, DVI.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- design two dimensional graphics and two dimensional transformations.
- design three dimensional graphics and three dimensional transformations.

- apply color models and clipping techniques to graphics.
- create basic multimedia presentations.
- design animation sequences.

TEXT BOOKS

1. Tay Vaughan, "Multimedia - Making it work", Tata Mc Graw Hill Edition, 8th edition 2011.

REFERENCES

1. Andleigh PK and Thakrar K . “Multimedia Systems Design”, Prentice Hall.,1995.
2. Walter Worth John .A, "Multimedia Technology and Applications", Ellis Horowood Ltd, 1991.
3. Nigel Chapman and Jenny Chapman, "Digital Multimedia", John Wiley & Sons Ltd.,2000.
4. John .F. Koegel Buford, "Multimedia Systems", Pearson education, 2005.

WEB LINKS

1. nptel.ac.in/courses/117105083
2. https://www.cs.cf.ac.uk/Dave/Multimedia/node12.html

CO-PO MAPPING:

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

IT15603 CRYPTOGRAPHY AND NETWORK SECURITY 3 2 0 4

COURSE OBJECTIVES

- to understand OSI security architecture and classical encryption techniques.
- to Identify and relate mathematical concepts to security trends.
- to describe and analyze modern symmetric key ciphers likeDES, AES and asymmetric key cipher RSA.
- to Implement and test various authentication techniques.
- to examine the functionality and workingprinciples of various security applications.

UNIT I INTRODUCTION AND NUMBER THEORY 15

Introduction - OSI security architecture – Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography) FINITE FIELDS AND NUMBER THEORY: Groups, Rings, Fields - Modular arithmetic - Euclid‟s algorithm - Finite fields- Polynomial Arithmetic – Prime numbers - Fermat‟s and Euler‟s theorem - Testing for primality - The Chinese remainder theorem- Discrete logarithms.

UNIT II BLOCK CIPHERS AND PUBLIC KEY CRYPTOGRAPHY 15

Data Encryption Standard - Block cipher principles - block cipher modes of operation - Advanced Encryption Standard (AES) - Triple DES-Blowfish - RC5 algorithm. **Public key cryptography:** Principles of public key. Cryptosystems -The RSA algorithm-Key management – Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNITIII HASH FUNCTIONS AND DIGITAL SIGNATURES 15

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 – SHA – HMAC – CMAC – Digital signature and authentication protocols – DSS.

UNITIV SECURITY PRACTICE AND SYSTEM SECURITY 15

Authentication applications – Kerberos – X.509 Authentication services – Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology - Types of Firewalls – Firewall designs – SET for E-Commerce Transactions. Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewallsdesign principles – Trusted system.

UNIT V E-MAIL, IP AND WEB SECURITY 15

E-mail Security: Security Services for E-mail – attacks possible through E-mail – establishing keys privacy- authentication of the source - Message Integrity – Non – repudiation - Pretty Good Privacy (PGP) - S/MIME. **IPSecurity:** Overview of IPSec – IP and IPv6 - Authentication Header-Encapsulation Security Payload (ESP)- Internet Key Exchange (Phases of IKE, ISAKMP / IKE Encoding). Web Security: SSL / TLS Basic Protocol- computing the keys- client authentication-PKI as deployed by SSL Attacks fixed in v3- Exportability - Encoding- Secure Electronic Transaction (SET).

TOTAL PERIODS 75

COURSE OUTCOMES

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

- compare various cryptographic techniques.
- apply the different cryptographic operations of public key cryptography.
- implement and test various authentication techniques.
- design secure applications.
- inject secure coding in the developed applications.

TEXT BOOKS

1. William Stallings, Cryptography and Network Security, 4th Edition, Prentice Hall, New Delhi,2006.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, "Network Security", Prentice Hall of India, 2002.(UNIT V).

REFERENCES

1. Behrouz A. Ferouzan, "Cryptography & Network Security", Tata Mc Graw Hill, 2007.
2. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003.
3. Charles Pfleeger, "Security in Computing", 4th Edition, Prentice Hall of India, 2006.
4. Ulysess Black, "Internet Security Protocols", Pearson Education Asia, 2000.
5. Charlie Kaufman and Radia Perlman, Mike Speciner, "Network Security, Second Edition, Private Communication in Public World", PHI 2002.

WEB LINKS

1. nptel.ac.in/courses/106105031
2. https://www.tutorialspoint.com/cryptography

CO-PO MAPPING:

Mapping of Course Outcomes with Programme Outcomes (3/2/1 indicates strength of correlation) 3-Strong,2-Medium,1-Weak														
Cos	**Programme Outcomes(Pos)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	1	-	2	-	-	-	-	-	-	-	3	2	1
CO2	3	3	2	1	1	-	-	-	-	-	-	1	3	2
CO3	1	2	-	2	1	-	-	-	-	-	-	1	1	1
CO4	2	2	3	1	1	-	-	-	-	1	-	1	1	3
CO5	2	1	-	2	-	-	-	2	-	-	-	-	2	2

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IT15604 EMBEDDED SYSTEMS 3 0 0 3

COURSE OBJECTIVES

- to have knowledge about the basic functions of embedded systems.
- to have knowledge about the basic working of a microcontroller system and its programming in assembly language.
- to provide experience to integrate hardware and software for microcontroller applications systems.
- to introduce students to the modern embedded systems and to show how to understand and program such systems using a concrete platform built around.
- to introduce students modern embedded processor like the Intel ATOM.

UNIT I EMBEDDED COMPUTING 9

Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller - ARM processor – Architecture - Instruction sets and programming.

UNIT II MEMORY AND INPUT / OUTPUT MANAGEMENT 9

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

UNIT III PROCESSES AND OPERATING SYSTEMS 9

Multiple tasks and processes – Context switching – Scheduling policies – Inter process communication Mechanisms – Performance issues.

UNIT IV EMBEDDED SOFTWARE 9

Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and Function sequences. Embedded software development tools – Emulators and debuggers.

UNIT V EMBEDDED SYSTEM DEVELOPMENT 9

Design issues and techniques – Case studies – Complete design of example embedded systems.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems.
- become aware of the architecture of the ATOM processor and its programming aspects (assembly Level).
- become aware of interrupts, hyper threading and software optimization.
- design real time embedded systems using the concepts of RTOS.
- analyze various examples of embedded systems based on ATOM processor.

TEXT BOOK

1. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006.Michael J. Pont, "Embedded C", Pearson Education, 2007.

REFERENCES

1. Steve Heath, "Embedded System Design", Elsevier, 2005.
2. Muhammed Ali Mazidi, Janice GillispieMazidi and Rolin D. McKinlay, "The 8051 Microcontroller and Embedded Systems", Pearson Education, Second edition, 2007.

WEB LINKS

1. nptel.ac.in/courses/108102045
2. https://www.tutorialspoint.com/embedded_systems/es_overview.htm

CO-PO MAPPING:

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

BA15254 PRINCIPLES OF MANAGEMENT 3 0 0 3

COURSE OBJECTIVES

- to understand history and development of management thought.
- to know the planning activities in management.
- to understand organizing, dimensions of organization structure, and choosing the right structural form.
- to know how to manage human resources.
- to understand various methods and techniques of control.

UNIT I INTRODUCTION TO MANAGEMENT 9

Management: Meaning – Scope - Managerial Roles. Management – Science - Art or Profession - Universality of Management - Ancient roots of management theory; Classical schools of management thought; Behavioral School - Quantitative School - Systems Approach - Contingency Approach - Contemporary Management thinkers & their contribution.

UNIT II PLANNING 9

Characteristics of planning - Planning Process - Types of plans - Decision making - Decision making tools - Group decision making - Forecasting & MBO.

UNIT III ORGANIZING 9

Organizational structure and design - types of organizational structures – authority – delegation - decentralization and reengineering - Organization Size – Technology – Environment – Power – control - choosing the right structural Form.

UNIT IV MANAGING HUMAN RESOURCES 9

Human resource planning – Recruitment – selection - training & development - performance appraisal - managing change - compensation and employee welfare - Leadership theory - Motivation Theory - Communication.

UNIT V CONTROLLING 9

Nature of organizational control - control process - Methods and techniques of control - Designing control systems.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- demonstrate history and development of management thought.
- exhibit the planning activities in management.
- know organizing, dimensions of organization structure, and choosing the right structural form.
- gain knowledge how to manage human resources.
- develop various methods and techniques of control.

TEXT BOOKS

1. Heinz Weihrich, Mark V. Cannice, Management a Global & Entrepreneurial Perspective, Ta McGraw-Hill Education, 2010.
2. James A.F. Stoner & R. Edward Freeman, Management, Prentice-Hall of India Private Limite New Delhi, 5/e, 2010.

REFERENCES

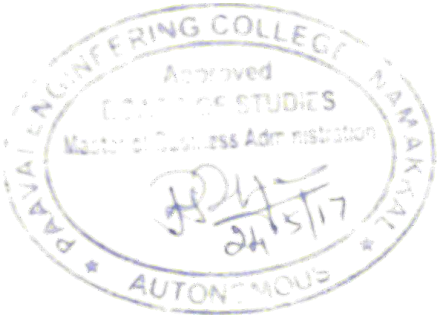
1. John R. Schermerhorn, Jr., Daniel G. Bachrach, Management, Wiley India, 13/e, 2015.
2. Joseph L Massie, Essentials of Management, Prentice-Hall India, New York, 4/e, 2013.
3. S.A.Sherlekar, Management, Himalaya Publications, Mumbai, 1/e, 2012.
4. L.M. Prasad, Principles of Management, Sultan Chand & Sons, New Delhi, 9/e, 2015.
5. Peter Drucker, Management, Harper Row, 2005.

WEB LINKS

1. https://www.slideshare.net/ersmbalu/principles-of-management-lecture-notes
2. mbaexamnotes.com/principles-of-management.html
3. https://www.cliffsnotes.com/study-guides/principles-of-management

CO-PO MAPPING:

Mapping of Course Outcomes with Programme Outcomes (3/2/1 indicates strength of correlation) 3-Strong,2-Medium,1-Weak														
COs	**Programme Outcomes (POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2	-	-	2	-	-	1	-	-	-	2	-
CO2	2	3	-	-	3	-	2	3	2	0	1	3	1	-
CO3	-	3	2	3	-	3	3	-	-	-	-	2	2	3
CO4	-	-	-	-	2	3	-	2	3	3	-	1	3	-
CO5	3	-	3	3	2	3	-	-	-	-	3	3	2	3



IT15606 COMPILER DESIGN LABORATORY 0 0 4 2

COURSE OBJECTIVES

- to be exposed to compiler writing tools.
- to learn to implement the different Phases of compiler.
- to be familiar with control flow and data flow analysis.
- to learn simple optimization techniques.

LIST OF EXPERIMENTS

1. Study of LEX and YACC
2. Lexical Analysis using LEX.
3. Syntax Analysis using YACC
4. Construction of NFA from a given regular expression.
5. Construction of minimized DFA from a given regular expression.
6. Implementation of Symbol Table.
7. Implementation of Shift Reduce Parsing Algorithm.
8. Construction of LR Parsing Table.
9. Generation of Code for a given Intermediate Code.
10. Implementation of Code Optimization techniques.

TOTAL PERIODS 60

COURSE OUTCOMES

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

- implement the different Phases of compiler using tools.
- analyze the control flow and data flow of a typical program.
- optimize a given program.
- generate an assembly language program equivalent to a source language program.

RECOMMENDED SYSTEM/SOFTWARE REQUIREMENTS

SOFTWARE: Turbo C,LEX and YACC,UNIX.

HARDWARE: Flavor of any WINDOWS and UNIX. Standalone desktops 30 Nos.

CO-PO MAPPING:

Mapping of Course Outcomes with Programme Outcomes (3/2/1 indicates strength of corelation) 3-Strong,2-Medium,1-Weak														
COs	**Programme Outcomes (POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	1	3	2	-	-	-	-	-	-	-	3	-	2
CO2	2	2	-	2	2	-	-	-	-	-	-	-	-	3
CO3	2	1	2	3	1	-	-	-	-	-	1	3	2	-
CO4	3	2	3	1	2	-	-	2	-	-	-	-	-	3

IT15607 GRAPHICS AND MULTIMEDIALABOROTARY 0 0 4 2

COURSE OBJECTIVES

- to understand the need of developing graphics applications.
- to learn the hardware involved in building graphics applications.
- to learn algorithmic development of graphics primitives like: line, circle, ellipse, polygon etc.
- to learn the representation and transformation of graphical images and pictures.
- to illustrate the impact of animations.

LIST OF EXPERIMENTS

1. Implementation of Line Drawing Algorithms a) DDA b) Bresenham
2. Implementation of Bresenham's Circle and Ellipse Generation Algorithm
3. Implementation of Two Dimensional Transformations
4. Composite 2D Transformations
5. Implementation of Cohen-Sutherland Line Clipping Algorithm
6. Implementation of 3D Transformations
7. Composite 3D Transformations
8. Animation using Image Effects Generator.
9. Game development using Flash
10. Video Editing

TOTAL PERIODS 60

COURSE OUTCOMES

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

- draw basic shapes such as lines, circle and ellipse.
- perform processing of basic shapes by various processing algorithms /techniques.
- apply the transformations to the basic shapes.
- design animation sequences

RECOMMENDED SYSTEM/SOFTWARE REQUIREMENTS

SOFTWARE: Adobe Flash Player, Dreamweaver, Photoshop 7.0.

HARDWARE: Flavor of any WINDOWS and UNIX. Standalone desktops 30 Nos.

CO-PO MAPPING:

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

EN15601 CAREER DEVELOPMENT LABORATORY II 0 0 2 1

COURSE OBJECTIVES

- to enhance career competency and employability skills
- to demonstrate effective leadership and interpersonal skills
- to improve professional capabilities through advanced study and researching current market strategy.
- to develop problem solving and decision making capabilities

UNIT I CORPORATE READINESS 6

Business Communication – Inter and Intra Personal skills – Business Etiquettes – Corporate ethics –Communication media Etiquette.

UNIT II INTERVIEW SKILLS 6

Resume building – Group discussions – Presentation skills – Entrepreneur skills – Psychometric assessment –Mock interview.

UNIT III QUANTITATIVE APTITUDE (QA) 2 6

Profit and Loss – Clock – Power and Square roots – Train – Boats and streams – Probability – Calendars –Permutations and Combinations - Partnership – Simplification – Pipes and Cisterns – Puzzles.

UNIT IV LOGICAL REASONING (LR) 2 6

Statements and Assumptions – Matching Definitions – Logical Games – Making judgments – Statements and conclusions – Verbal classifications.

UNIT V VERBAL REASONING (VR) 2 6

Syllogisms – Data sufficiency – Dice – Series completion – Character puzzles – cube and cuboids – Arithmetic Reasoning.

TOTAL PERIODS 30

COURSE OUTCOMES

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

- demonstrate aptitude and reasoning skills
- enhance ever baland written ability
- improve his /her grooming and presentation skills
- interact effectively on any recent event/ happenings/current affairs.
- be a knowledgeable person on the various evaluation processes leading to employ entand face the same with confidence.

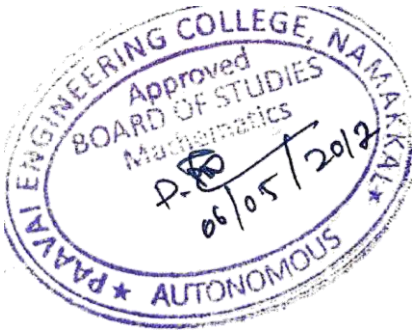
REFERENCES

1. Agarwal, r.s.” a modern approach to verbal & non verbal reasoning”, , S.Chand & co ltd, New Delhi.
2. Abhijit guha, “quantitative aptitude for competitive examinations “, Tata Mcgraw hill
3. Word power made easy by norman lewis ,wr.goyal publications.

4. Johnson, d.w. (1997). Reaching out – interpersonal effectiveness and self Actualization -- Boston: Allyn and bacon.
5. Infosys Campus Connect Program – students' guide for soft skills.
6. Mitra ,barun.k, " Personalaity Development & Softskills " , Oxford University.

CO-PO MAPPING:

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



ELECTIVE I

MA15151 DISCRETE MATHEMATICS 3 2 0 4

OBJECTIVES

To enable students to

- Introduce students to ideas and techniques from discrete mathematics that are widely used in science and engineering.
- Make the students to think logically and mathematically and apply these techniques in solving problems.
- Provide the foundation forim bedding logical reasoning in computer science.
- Develop recursive algorithms based on mathematical induction.
- Know basic properties of relations.

UNIT I PROPOSITIONAL CALCULUS 9

Propositions - Logical connectives - Compound propositions - Conditional and conditional propositions –Truth tables - Tautologies and contradictions - Contrapositive – Logical equivalences and implications - DeMorgan‟s Laws - Normal forms - Principal conjunctive and disjunctive normal forms-Rules of inference-Arguments – Validity of arguments.

UNIT II PREDICATE CALCULUS 9

Predicates - Statement function - Variables - Free and bound variables - Quantifiers -Universe of discourse - Logical equivalences and implications for quantified statements -Theory of inference - The rules of universal specification and generalization - Validity of arguments.

UNIT III SET THEORY 9

Basic concepts - Notations - Subset - Algebra of sets - The power set - Ordered pairs and Cartesian product - Relations on sets - Types of relations and their properties – Relational matrix and the graph of relation-Partitions Equivalence relations.

UNIT IV FUNCTIONS 9

Definitions of functions - Classification of functions - Type of functions - Examples -Composition of functions - Inverse functions - Binary and n - ary operations – Characteristic function of a set-Hashing functions –Recursive functions-Permutation functions.

UNIT V LATTICE THEORY 9

Partial ordering - Posets - Lattices as Posets - Properties of lattices - Lattices as Algebraic systems-Sub lattices-Direct product and Homomorphism-Some Special lattices.

TOTAL PERIODS 45

OUTCOMES

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

- Construct mathematical arguments using logical connectives and quantifiers.
- Verify the correctness of an argument using propositional and predicate logic and truth tables.

- Demonstrate the ability to solve problems using counting techniques and combinatorics Construct proofs using direct proof, proof by contraposition, proof by contradiction,and proof by cases.
- Perform operations on discrete structures such as sets, functions, relations, and sequences.
- Understand the concepts of Boolean algebra.

TEXTBOOKS

1. KennethH.Rosen,"DiscreteMathematicsanditsApplications(withCombinatoricsandGraph Theory)",6thEdition, TataMcGraw -Hill,5th Reprint 2008.
2. Trembly J.P and Manohar.R, "Discrete Mathematical Structures with Applications to Computer Science", TataMcGraw-Hill,35th Reprint 2008.

REFERENCES

1. Ralph.P.Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction",4th Edition, Pearson Education, 2002.
2. A.Tamilarasi,A.M.Natarajan,"DiscreteMathematicsanditsApplications",3rdEdition,KhannaPublishers, 2008.
3. T.Veerarajan, "Discrete Mathematics with Graph Theory and Combinatorics", TataMcGraw -Hill, 2007.

CO-PO MAPPING:

Mapping of Course Outcomes with Programme Outcomes (1/2/3 indicates strength of correlation)3-strong,2-Medium,1-Weak														
COs	**Programme Outcomes(POs)**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	-	-	-	-	-	-	-	3	3	3
CO2	3	2	3	3	-	-	-	-	-	-	-	2	3	3
CO3	2	3	3	-	-	-	-	-	-	-	-	3	3	3
CO4	2	2	3	3	-	-	-	-	-	-	-	2	3	3
CO5	3	3	3	-	-	-	-	-	-	-	-	3	3	3

IT15151 AUTOMATA LANGUAGES AND COMPUTATION **3 0 0 3**

COURSE OBJECTIVES

- to introduce concepts in automata theory and theory of computation.
- to identify different formal language classes and their relationships.
- to design grammars and recognizers for different formal languages.
- to prove or disprove theorems in automata theory using its properties.
- to determine the decidability and intractability of computational problems.

UNIT I AUTOMATA **9**

Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA)– Deterministic Finite Automata (DFA)– Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

UNIT II REGULAR EXPRESSIONS AND LANGUAGES **9**

Regular Expression – FA and Regular Expressions – Proving languages not to be regular –Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III CONTEXT-FREE GRAMMARS AND LANGUAGES **9**

Context-Free Grammar (CFG– Parse Trees – Ambiguity in grammars and languages –Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.

UNIT IV PROPERTIES OF CONTEXT-FREE LANGUAGES **9**

Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines Programming Techniques for TM.

UNIT V UNDECIDABALITY **9**

A language that is not Recursively Enumerable (RE) – Anundecidable problem that is RE –Undecidable Problems about Turing Machine – Post's Correspondence Problem – The classes Pand NP.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- designgrammars and automata (recognizers) for different language classes.
- acquire a fundamental understanding of the core concepts in automata theory and formal languages.
- identify formal language classes and prove language membership properties
- prove and disprove theorems establishing key properties of formal languages andautomata
- acquire a fundamental understanding of core concepts relating to the theory of computation and computational models including decidability

TEXT BOOK

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory,Languages and Computations", second Edition, Pearson Education, 2007.

REFERENCES

1. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.
2. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science, Languages and Machines", ThirdEdition, Pearson Education, 2007.
3. Raymond Greenlaw an H.James Hoover, " Fundamentals of Theory of Computation, Principles and Practice",Morgan Kaufmann Publishers, 1998.
4. MichealSipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.
5. J. Martin, "Introduction to Languages and the Theory of computation" ThirdEdition, Tata McGraw Hill,2007.

WEB LINK

1. www.nptelvideos.in/2012/11/theory-of-computation.html

CO-PO MAPPING:

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

IT15152 INFORMATION CODING TECHNIQUES 3 0 0 3

COURSE OBJECTIVES

- to understand the basic classes of compression techniques.
- to know how to apply compression techniques to practical situations.
- to applythe ideas of entropy and information content.
- to analysis coding techniques will perform in different situations.
- to understand the current state of the area for both data compression and channel coding.

UNIT I INFORMATION THEORY 9

Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon – Fanon coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memory less channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH 9

Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder,LinearPredictive Coding.

UNIT III SOURCE CODING: IMAGE AND VIDEO 9

Image and Video Formats– GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard .

UNIT IV ERROR CONTROL CODING: BLOCK CODES 9

Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder anddecoder - CRC .

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES 9

Convolution codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding .

TOTAL PERIODS 45

COURSE OUTCOMES

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

- apply knowledge of advanced principles to the analysis of electrical and computer engineering problems.
- apply knowledge of advanced techniques to the design of electrical and computer engineering systems.
- apply the appropriate industry practices, emerging technologies, state-of- the-art design techniques, software tools, and research methods of solving electrical and computer engineering problems.
- maintain life-long learning and continue to be motivated to learn new subject.

- understand new subjects that are required to solve problems in industry without being dependent on a classroom environment.

TEXT BOOKS

1. R Bose, "Information Theory, Coding and Crptography", TMH 2007.
2. Fred Halsall, "Multidedia Communications: Applications, Networks, Protocols and Standards", Perason Education Asia, 2002.

REFERENCES

1. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006.
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2007.
3. Amitabha Bhattacharya, "Digital Communication", TMH 2006.

WEB LINKS

1. nptel.ac.in/courses/117101053
2. https://wiki.metakgp.org/w/EC60083_:_Information_Theory_And_Coding_Techniques

CO-PO MAPPING:

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

IT15153 SOFTWARE ARCHITECTURE 3 0 0 3

COURSE OBJECTIVES

- to understand the fundamentals of architectures.
- to understand software architectural requirements and drivers.
- to be exposed to architectural styles and views.
- to be familiar with architectures for emerging technologies.
- to understand the creativity of the software's.

UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS 9

Introduction –What is software architecture? – Standard Definitions – Architectural structures – Influence of software architecture on organization-both business and technical – Architecture Business Cycle-Introduction –Functional requirements – Technical constraints – Quality Attributes.

UNIT II QUALITY ATTRIBUTE WORKSHOP 9

Quality Attribute Workshop – Documenting Quality Attributes – Six part scenarios – Case studies.

UNIT III ARCHITECTURAL VIEWS 9

Introduction – Standard Definitions for views – Structures and views - Representing views-available notations –Standard views – 4+1 view of RUP, Siemens 4 views, SEI's perspectives and views – Case studies**.**

UNIT IV ARCHITECTURAL STYLES 9

Introduction – Data flow styles – Call-return styles – Shared Information styles - Event styles – Case studies for each style.

UNIT V DOCUMENTING THE ARCHITECTURE 9

Good practices – Documenting the Views using UML – Merits and Demerits of using visual languages Need for formal languages - Architectural Description Languages – ACME – Case studies. Special topics: SOA andWeb services – Cloud Computing – Adaptive structures.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- explain influence of software architecture on business and technical activities.
- identify key architectural structures.
- use styles and views to specify architecture.
- design document for a given architecture.
- meet the demands of the industry.

TEXT BOOKS

1. Len Bass, Paul Clements, and Rick Kazman, "Software Architectures Principles and Practices",2nd Edition, Addison-Wesley,2003.
2. Anthony J Lattanze, "Architecting Software Intensive System. A Practitioner's Guide", Auerbach Publications,2010.

REFERENCES

1. Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson,Robert Nord, and Judith Stafford, "Documenting Software Architectures. Views and Beyond", 2ndEdition, Addison-Wesley, 2010.
2. Paul Clements, Rick Kazman, and Mark Klein, "Evaluating software architectures: Methods and case studies. Addison-Wesley, 2001.
3. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, "Cloud Computing. Principles and Paradigms", John Wiley & Sons, 2011.
4. Mark Hansen, "SOA Using Java Web Services", Prentice Hall, 2007.

WEB LINKS

1. www.sei.cmu.edu/architecture
2. https://www.tutorialspoint.com/software_architecture_design/key_principles.htm

CO-PO MAPPING:

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

IT15154 USER INTERFACE DESIGN 3 0 0 3

COURSE OBJECTIVES

- to learn about graphical system.
- to study about design standards.
- to learn about the controls used in windows.
- to study about the multimedia.
- to perform various test in windows layout.

UNIT I INTRODUCTION 9

Human–Computer Interface – Characteristics of Graphics Interface –Direct Manipulation Graphical System - Web User Interface –Popularity –Characteristic & Principles.

UNIT II HUMAN COMPUTER INTERACTION 9

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design– Human Interaction Speed –Business Functions –Requirement Analysis – Direct – Indirect Methods – Basic Business Functions – Design Standards – System Timings – Human Consideration In Screen Design – Structures Of Menus –Functions Of Menus– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice–Navigating Menus–Graphical Menus.

UNIT III WINDOWS 9

Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations-WebSystems– Device– Based Controls Characteristics– Screen – Based Controls – Operate Control – Text Boxes–Selection Control– Combination Control– Custom Control– Presentation Control.

UNIT IV MULTIMEDIA 9

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization Accessibility– Icons–Image– Multimedia – Coloring.

UNIT V WINDOWS LAYOUT-TEST 9

Prototypes – Kinds of Tests – Retest – Information Search – Visualization – Hypermedia – WWW– SoftwareTools.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- identify and define key terms related to user interface.
- understand the design standards.
- explain the user interface design process.
- implement the multimedia effects.
- perform various test in windows layout.

TEXT BOOKS

1. Wilbent. O. Galitz ,“The Essential Guide To User Interface Design”, John Wiley&Sons, 2001.
2. Ben Sheiderman, “Design The User Interface”, Pearson Education, 1998.

REFERENCE

1. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd., 2002.

WEB LINKS

1. nptel.ac.in/courses/106105087/20
2. https://www.tutorialspoint.com/software.../software_user_interface_design.htm

CO-PO MAPPING:

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

ELECTIVE II

IT15251 FREE AND OPEN SOURCE SOFTWARE 3 0 0 3

COURSE OBJECTIVES

- to understand the basics of open source operating systems.
- to gain the knowledge of working with linux platform and open source database.
- to be familiar with programming languages PHP, Perl, Python.
- to learn some important FOSS tools and techniques.
- to be familiar with participating in a FOSS project.

UNIT I INTRODUCTION 9

Introduction to open sources – Need of Open Sources– Advantages of Open Sources –Application of pen mode – Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals –Development with Linux.

UNIT II OPEN SOURCE DATABASE 9

Introduction – Setting up account –Starting, terminating and writing your own SQL programs – Record selection. Technology – Working with strings –Date and Time – Sorting Query Results – Generating Summary – Working with metadata – Using sequences –MySQL and Web

UNIT III OPEN SOURCE PROGRAMMING LANGUAGES 9

PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP –String Manipulation and regular expression – File handling and data PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging anderror handling – Security –Templates.

UNIT IV PYTHON 9

Syntax and Style – Python Objects – Numbers – Sequences – Strings –Lists and Tuples – Dictionaries –OOP – Conditionals and Loops – Files – Input and Output –Errors and Exceptions – Functions – Modules – Classes and Execution Environment.

UNIT V PERL 9

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- install and run open-source operating systems.
- gather information about Free and open source software projects from software release and from sites inthe internet.
- build and modify one or more Free and open source software packages
- develop programs using PHP, Perl, Python and MySQL.
- contribute software to interact with freeand opens source software development projects.

TEXT BOOKS

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003.
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002.

REFERENCES

1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O‟Reilly, 2002.
2. Wesley J. Chun, “Core Phython Programming”, Prentice Hall, 2001.
3. Martin C. Brown, “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

WEB LINKS

1. http://nptel.ac.in/courses/117108124/
2. https://www.youtube.com/watch?v=gD4KOy2XjKY

CO-PO MAPPING:

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

IT15252 **DISTRIBUTED SYSTEMS** **3 0 0 3**

COURSE OBJECTIVES

- to provide knowledge on principles and practice underlying in the design of distributed systems.
- to layout foundations of distributed systems.
- to introduce the idea of middleware and related issues.
- to understand in detail the system level and support required for distributed system.
- to understand the issues involved in studying data and design of distributed algorithms.

UNIT I INTRODUCTION 9

Introduction - Examples of Distributed Systems - Trends in Distributed Systems - Focus on resource sharing - Challenges. Case study: World Wide Web.

UNIT II COMMUNICATION IN DISTRIBUTED SYSTEM 9

System Model - Inter process Communication the API for internet protocols - External datarepresentation and Multicast communication. Network virtualization: Overlay networks. Case study: MPI.

UNIT III REMOTE METHOD INVOCATION AND OBJECTS 9

Remote Invocation – Introduction - Request-reply protocols - Remote procedure call - Remote methodinvocation. Case study: Java RMI - Group communication - Publish-subscribe systems -Message queues– Shared memory approaches –Distributed objects - Case study: CORBA - from objects to components.

UNIT IV PEER TO PEER SERVICES AND FILE SYSTEM 9

Peer–to-peer Systems - Introduction - Napster and its legacy - Peer-to-peerMiddleware - Routing Overlays -Overlay case studies: Pastry, Tapestry- Distributed File Systems - Introduction – File servicearchitecture - Andrew File system.

UNIT V SYNCHRONIZATION AND REPLICATION 9

Introduction - Clocks, events and process states - Synchronizing physical clocks- Logical time and logical clocks-Global states - Coordination and Agreement– Introduction - Distributed mutual exclusion - Elections - Transactions and Concurrency Control -Transactions -Nested transactions - Locks – Optimistic concurrency control - Timestamp ordering -Distributed deadlocks - Replication - Case study - Coda.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- articulate the principles and standard practices underlying the design of distributed andparallel systems.
- explain the core issues of distributed and parallel systems.
- appreciate the difficulties in implementing basic communication in parallel and distributed systems.

- have knowledge on the substantial difficulty in designing parallel and distributed algorithms in comparison to centralized algorithms.
- appreciate the issues in distributed operating system, resource management and fault tolerance.

TEXT BOOK

1. GeorgeCoulouris, Jean Dollimore, Tim Kindberg,"Distributed Systems Concepts and Design" Fifth edition – 2011- Addison Wesley.

REFERENCES

1. Tanenbaum A.S.,Van Steen M.,"Distributed Systems: Principles and Paradigms", Pearson Education ,2007.
2. Liu M.L.,"Distributed Computing, Principles and Applications", Pearson and education,2004.

WEB LINKS

1. http://nptel.ac.in/courses/106106107/
2. http://freevideolectures.com/Course/2493/Computer-Systems-Laboratory-Colloquium/17

CO-PO MAPPING:

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

BA15351 ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING 3 0 0 3

COURSE OBJECTIVES

- to know the fundamentals of managerial economics.
- to be familiar with demand and supply analysis.
- to understand the production and cost analysis.
- to describe the various financial accounting techniques.
- to understand the significance of capital budgeting.

UNIT I INTRODUCTION 9

Managerial Economics - Relationship with other disciplines - Firms: Types, objectives and goals – Managerial decisions - Decision analysis.

UNIT II DEMAND & SUPPLY ANALYSIS 9

Demand - Types of demand - Determinants of demand - Demand function - Demand elasticity - DemandForecasting - Supply - Determinants of supply - Supply function.

UNIT III PRODUCTION AND COST ANALYSIS 9

Production function - Returns to scale - Production optimization - Least cost input - Isoquants - Managerial usesof production function. Cost Concepts - Cost function - Determinants of cost - Short run and Long run cost curves- Cost Output Decision - Estimation of Cost.

UNIT IV FINANCIAL ACCOUNTING 9

Final Accounts – Trading Accounts – Profit and Loss Accounts – Balance sheet - Cash flow analysis - Funds flowAnalysis.

UNIT V CAPITAL BUDGETING 9

Investments - Risks and return evaluation of investment decision - Average rate of return - Payback Period – Net Present Value - Internal rate of return.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- acquire knowledge in the basic concepts of managerial economics.
- identifythe role demand and supply analysis.
- understand the production and cost analysis.
- knowthe applications of financial accounting.
- be familiar with the scope capital budgeting

REFERENCES

1. G S Gupta, " Managerial Economics", Tata McGraw-Hill Education, 2011
2. Samuelson. Paul A and Nordhaus W.D., 'Economics', Tata Mcgraw Hill Publishing Company Limited,New Delhi, 2004
3. G S Gupta, Samuel Paul, V. L. Mote, "Managerial Economics – Concepts and Cases" McGraw Hill Education, New Delhi, 2004

4. Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill Publishing Ltd., 4th edition, 2005.

5. N. Gregory Mankiw, Principles of Economics, 3rd edition, Thomson learning, New Delhi,2007.

WEB LINKS

1. www.managementstudyguide.com
2. www.economicsconcepts.com
3. www.economist.com

CO-PO MAPPING:

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

IT15253 TCP / IP PROTOCOL DESIGN AND IMPLEMENTATION 3 0 0 3

COURSE OBJECTIVES

- to understand the IP addressing schemes.
- to knowthe fundamentals of network design and implementation.
- to analysis the design and implementation of TCP/IP networks.
- to understand on network management issues.
- to learn to design and implement network applications.

UNIT I INTRODUCTION 9

Internetworking concepts and architecture model – classful Internet addresses – CIDR – Subletting and Super.netting – AARP – RARP- IP- IP Routing – ICMP – IPV6.

UNIT II TRANSMISSION CONTROL PROTOCOL 9

Services – header – connection establishment and termination – interactive data flow – bulk data flow – timeout and retransmission – persist timer – keep alive timer – futures and performance

UNIT III IP IMPLEMENTATION 9

IP global software organization –routing table–routing algorithms – fragmentation and reassembly –errorprocessing (ICMP) – Multicast Processing (IGMP).

UNIT IV TCP IMPLEMENTATION I 9

Data structure and input processing – transmission control blocks – segment format – comparison– finite state machine implementation – Output processing – mutual exclusion –computing the computing the TCP Datalength.

UNIT V TCP IMPLEMENTATION II 9

Timers – events and messages – timer process – deleting and inserting timer event – flow control and adaptive retransmission– congestion avoidance and control – urgent data processing and push function.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- design and implement TCP/IP networks
- explain network management issues.
- design and implement network applications & develop data structures for basic protocol functions of TCP/IP.
- apply the members in the respective structures. .
- design and implement data structures for maintaining multiple local and global time.

TEXT BOOKS

1. Douglas E Comer,"Internetworking with TCP/IP Principles, Protocols and Architecture", Vol 1, Edition 2006.
2. W.Richard Stevens "TCP/IP Illustrated" Vol 1. Pearson Education, 2003.

REFERENCES

1. Forouzan, “TCP/IP Protocol Suite” Second Edition, Tata MC Graw Hill, 2003.
2. W.Richard Stevens “TCP/IP Illustrated” Volume 2, Pearson Education 2003.

WEB LINKS

1. http://nptel.ac.in/courses/106105082/35
2. http://freevideolectures.com/Course/2308/Internet-Technology/3

CO-PO MAPPING:

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

IT15254 **SYSTEM SOFTWARE** **3 0 0 3**

COURSE OBJECTIVES

- to understand the relationship between system software and machine architecture.
- to know thesign and implementation of assemblers.
- to understand the major concept of loader and linker.
- to have an understanding of macroprocessors.
- to understand the major concept of interactive debugging systems and software tools.

UNIT I INTRODUCTION 9

System softwareand machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes -instruction sets - I/O and programming

UNIT II ASSEMBLERS 9

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine Multi dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine Independent assembler features - Literals –Symbol-defining statements – Expressions - Onepass assemblers and pass assemblers - Implementation example - MASM assembler.

UNIT III LOADERS AND LINKERS 9

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader -Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine- Independent loader features–Automatic Library Search – Loader Options - Loader design options – Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

UNIT IV MACRO PROCESSORS 9

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and datastructures - Machine-independent macro processor features -Concatenation of Macro Parameters – Generation of Unique Labels–Conditional Macro Expansion – Keyword Macro Parameters – Macro withinMacro-Implementation example -MASM Macro Processor – ANSI C Macro language

UNIT V SYSTEM SOFTWARE TOOLS 9

Text editors - Overview of the Editing Process - User Interface – Editor Structure. -Interactive debugging systems -Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

TOTAL PERIODS 45

COURSE OUTCOMES

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

- identify the approach of machine architecture.
- compare assembler and macro assemblers and understand the concepts of machine independent loader.
- implement and contrast the concept of linker.
- apply systematic procedure for interactive debugging system.
- understand the concept system software tools.

TEXT BOOK

1. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2006.

REFERENCES

1. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 2000.
2. John R. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.
3. D. M. Dhamdhere, "Systems Programming and Operating Systems", SecondRevised Edition, Tata McGraw-Hill, 2000.

WEB LINKS

1. http://nptel.ac.in/courses/106106092/2
2. http://freevideolectures.com/Course/2277/Computer-Organization/2

CO-PO MAPPING:

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