

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: IT40105

REF NO: To be filled by CD office

IT SERVICE MANAGEMENT

Credits: 4

Teaching Scheme: - Theory 3 Hrs/Week

Prerequisites:

1. Cloud Computing/IT Infrastructure
2. Data Communication and Computer Networks
3. Linux

Objectives:

1. Determine current IT infrastructure, services and processes
2. Come up with futuristic IT management practices
3. Design a roadmap to elevate the business from “current state” to “desired state”
4. Formulate steps for the roadmap

Course Details:

Unit 1

Title: Introduction to IT Service Management:

(06 Hrs)

U1.1

Introduction to IT Service Management, The Service Lifecycle: Service strategy, Service design, Service transition, Service operation, continual service improvement.

U1.2. Self Study: ITIL security management, Supply management (procurement)

Unit 2

Title: Introduction to Data centre:

U2.1

Data centre Architecture, Data centre Requirements, Data centre prerequisites, Data centre Structure **(08 Hrs)**

U2.2. Self Study: Floor design and Deployment of Data centre

Unit 3

Title: Infrastructure in Data Centre:

(08 Hrs)

U3.1

ISP Network infrastructure, ISP WAN links, Network Operation Centre, Network Monitoring, Reasons of Data centre consolidation, server consolidation, Network service consolidation process, data centre server.

U3.2. Self Study: server capacity planning.

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Unit 4

Title: Virtualization for Data Center Management:

(08 Hrs)

Unit 4.1

Introduction of Virtualization, Different types of Virtualization: Hardware virtualizaion, Software virtualization, Storage virtualization, Os virtualization: windows and Linux virtualizaion, virtual private cloud setup method

U3.2. Self Study: server virtualization

Unit 5

Title: Security Issues:

Unit 5.1

(08 Hrs)

Security Guidelines: Unix security, internet security, source security issues, System Administration Work Automation, Cluster Architecture

Unit 5.

Self Study: Cluster Requirements

Text Books:

- T1. IT Infrastructure and its Management by Phalguni Gupta, Surya prakash and Umarani Jayaraman, TMH
- T2. IT System Management by Rich Schiesser, 2nd edition, prentice Hall.
- T3. IT Service Management by Ernest Brewster, Richard Griffiths, Aid an Lawes, John Sansbury, Viva Books Private Limited.
- T4. IT Service Management from Hell Based On Not ITIL by B. Johnson, P. Wilkinson, Van Haren Publishing

Reference Books:

- R1. IT System Management for Newbies: Expert Guidance for beginners, kindle edition by William Edwards
- R2. Foundation of IT Service Management by Brady Orand.

Course Outcomes:

Upon completion of the course, graduates will be able to –

1. Analyze the IT Service Management and their different service lifecycle.
2. Create data centre architecture and design based on service requirement.
3. Plan data centre infrastructure based on its operation.
4. Analyze and deploy different types of virtualizations.
5. Deal with server security and deployment of cluster.

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COURSE CODE: IT40105

REF NO: To be filled by CD office

IT Service Management Tutorial

Credits: 01

Teaching Scheme: - Tutorial 01 Hrs/Week

Prerequisites:

1. Cloud Computing/IT Infrastructure
2. Data Communication and Computer Networks
3. Linux

Objectives:

1. Determine current IT infrastructure, services and processes
2. Come up with futuristic IT management practices
3. Design a roadmap to elevate the business from “current state” to “desired state”
4. Formulate steps for the roadmap

Course Details:

List of Contents

Exercises/ Problem solving/ Programming on the following areas:

Tutorial No. 1: IT Service Management and Service Strategy.

Tutorial No. 2: Service Design and Operation.

Tutorial No. 3: Data centre Structure and Architecture.

Tutorial No. 4: Data centre Requirements and its Deployment.

Tutorial No. 5: Data centre consolidation and Network service consolidation process.

Tutorial No. 6: Server capacity planning.

Tutorial No. 7: Virtualization for Data Center Management

Tutorial No. 8: Windows and Linux Virtualization

Tutorial No. 9: Security challenges in IT Management.

Tutorial No. 10: System Administration and Work Automation.

Text Books:

- T1. IT Infrastructure and its Management by Phalguni Gupta, Surya prakash and Umarani Jayaraman, TMH
- T2. IT System Management by Rich Schiesser, 2nd edition, prentice Hall.

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T3. IT Service Management by Ernest Brewster, Richard Griffiths, Aidan Lawes, John Sansbury, Viva Books Private Limited.

T4. IT Service Management from Hell Based On Not ITIL by B. Johnson,
P. Wilkinson, Van Haren Publishing

Reference Books:

R1. IT System Management for Newbies: Expert Guidance for beginners, kindle edition by William Edwards

R2. Foundation of IT Service Management by Brady Orand.

Course Outcomes:

Upon completion of the course, graduates will be able to –

1. Analyze the IT Service Management and their different service lifecycle.
2. Create data centre architecture and design based on service requirement.
3. Plan data centre infrastructure based on its operation.
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5. Deal with server security and deployment of cluster.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: IT40108

REF NO: -----

Computational Intelligence

Credits: 3

Teaching Scheme: Theory 3 Hrs/Week

Prerequisites:

1. Design & Analysis of Algorithm
2. Discrete Mathematics
3. Probability & Statistics

Objectives:

1. To make the students familiarize with fundamental understanding of Soft Computing principles.
2. To enable students, using Soft-Computing tools solve some real life problems.
3. To make students able to analyse and apply various hybrid soft computing methods in different problem domains and find their applications.
4. To evaluate the power and limitation of Swarm Intelligence in solving computational problems.

Course Details:

Unit-1 Title- Neural Network

(8 Hrs)

U 1.1 Introduction: Introduction to Computational Intelligence (CI) and applications, Constituents of CI, Soft computing and hard computing.

U1.2: Artificial Neural Network(ANN): Introduction and Role of Neural Network (NN), Basic Models of an artificial Neuron, Neural Network Architecture, Learning methods, Terminologies of ANN, Hebb network, Supervised Learning Networks: Perceptron, MLP, Architecture of a Back propagation Network : back propagation, Learning Effect of Tuning parameters of the Back propagation.

U1.3 Self study: Solving Problems based on Hebb Network, MLP & Back propagation algorithms.

Unit-2 Title- Fuzzy Logic

(6 Hrs)

U 2.1 Fuzzy Set Theory: crisp sets, fuzzy sets, crisp relations, fuzzy relations, **Fuzzy Systems:** Crisp logic predicate logic, fuzzy logic, fuzzy Rule based system, Defuzzification Methods, Fuzzy rule based reasoning

U 2.2 Self study: Different fuzzy Models

Unit-3 Title- Genetic Algorithm

(6 Hrs)

U.3.1 Fundamentals of Genetic Algorithms: Encoding, Fitness functions, Reproduction. Genetic Modelling : Cross cover, Inversion and deletion, Mutation operator, Bit-wise

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operators, Bitwise operators used in GA. Convergence of Genetic algorithm. Applications , Real life Problems.

U.3.2 Self Study: Implement genetic programming for solving various optimization problems.

Unit-4 Title- Swarm Intelligence **(8 Hrs)**

U.4.1 Swarm Intelligence: Introduction to Swarm Intelligence, Key Principles, Swarm Optimization as a feature optimization tool.

U.4.2 Ant Colony Optimization: From Real to Artificial Ants, Ant Colony Optimization algorithm, Application in Travelling Salesman Problem.

U.4.3 Particle swarm Optimization: Concepts and Parameters understanding, Algorithm in detail, Application in Medical domain.

U.4.4 Self Study: Analysis and Implementation of Fish Swarm Optimization in feature optimization problems.

Unit-5 Title- Hybridization **(6 Hrs)**

U.5.1 Hybrid Soft Computing Techniques: Hybrid system, neural Networks, fuzzy logic and Genetic algorithms hybrids. Genetic Algorithm based Back propagation Networks: GA based weight determination applications: Fuzzy logic controlled genetic Algorithms soft computing tools, Applications.

U.5.2 Self Study: Implement ANFIS for a real life problem

Text Books:

1. Principles of Soft Computing- S.N.Sivanandan and S.N.Deepa, Wiley India, 2nd Edition,2011
2. Neuro Fuzzy and Soft Computing, J. S. R. JANG,C.T. Sun, E. Mizutani, PHI
3. Swarm Intelligence (The Morgan Kaufmann Series in Evolutionary Computation) - Russell C. Eberhart , Yuhui Shi, James Kennedy.

Reference Books:

1. Neural Networks, Fuzzy Logic, and Genetic Algorithm (synthesis and Application) S.Rajasekaran, G.A. Vijayalakshmi Pai, PHI
2. Haykin, S., Neural Networks - A Comprehensive Foundation (2nd Edition). Macmillan, 1999.
3. Randy L.Haupt and Sue Ellen Haupt , Practical Genetic Algorithms.

Course Outcome:

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- CO1.** Investigate and analyze optimization problems and apply the concepts of Artificial Neural Network (ANN).
- CO2.** Design Fuzzy system using the concepts of Fuzzy set theory.
- CO3.** Apply Genetic algorithms for solving various real life engineering and societal problems.
- CO4.** Use swarm Intelligence for solving optimization problems in societal application.
- CO5.** Apply Hybrid Soft Computing Techniques for some real life applications.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: IT40308

REF NO: _____

Computational Intelligence Lab

Credits:1

Teaching Scheme: Laboratory 2Hrs/Week

Pre requisites:

- Computer Programming using C and Data Structures
- Design & Analysis of Algorithm
- Basic knowledge of MATLAB/SCILAB is desirable

Objectives: The objectives of this theory course are:

1. To make the students familiarize with fundamental understanding of MATLAB.
2. To enable students design and simulate CI based models to solve real life problems
3. To implement computational learning models for classification, optimization and decision making using soft computing techniques

List of Experiments

Experiment No.1: writing simple programs using MATLAB or SCILAB such as:

Print Halo World, Vector & Matrix Operations, Using Control Structures, Reading and writing image files, using system defined functions, writing user defined functions.

Experiment No.2: To perform fuzzy Union, Intersection, and Complement operations.

Experiment No.3: To plot various fuzzy membership functions

Experiment No.4: To implement FIS Editor. Use Fuzzy toolbox to model tip value that is given after a dinner based on quality and service

Experiment No.5: To Implement Back propagation algorithm for classification problem

Experiment No.6: To Implement genetic algorithm for function optimization

Experiment No.7: To implement De-Morgan's Law using fuzzy sets.

Experiment No.8: To implement perceptron net for an AND function with bipolar inputs and targets

Experiment No.9: To Implement Hebb Network to classify two dimensional input patterns in bipolar with given targets.

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Experiment No.10: To Implement different fuzzy composition operations

Experiment No.11: To store vector in an auto-associative net. Find weight matrix & test the net with input

Experiment No.12: Perform optimization using PSO or ACO

Note: At least 10 experiments to be done as per the above list.

Text books:

1. Principles of Soft Computing- S.N.Sivanandan and S.N.Deepa, Wiley India, 2nd Edition,2011
2. Neuro Fuzzy and Soft Computing, J. S. R. JANG,C.T. Sun, E. Mizutani, PHI
3. Swarm Intelligence (The Morgan Kaufmann Series in Evolutionary Computation) - Russell C. Eberhart , Yuhui Shi, James Kennedy.

Reference Books:

1. Neural Networks, Fuzzy Logic, and Genetic Algorithm (synthesis and Application) S.Rajasekaran, G.A. Vijayalakshmi Pai, PHI
2. Haykin, S., Neural Networks - A Comprehensive Foundation (2nd Edition). Macmillan, 1999.
3. Randy L.Haupt and Sue Ellen Haupt , Practical Genetic Algorithms.

Course Outcomes:

Upon completion of the course, graduates will be able to –

- 1) Use MATLAB/SCILAB for mathematical problem solving with Fuzzy approach
- 2) Develop MATLAB/SCILAB programs to implement CI models such as ANN, GA
- 3) Develop MATLAB/SCILAB programs to implement other optimization algorithms to solve problems.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: CS42176

REF NO: To be filled by CD office

Pervasive Computing

Credits: 3

Teaching Scheme: - Theory 3 Hrs/Week

Prerequisites:

1. Computer Programming
2. Data Communication and Commuter Networks

Objectives:

1. To introduce the characteristics, basic concepts and systems issues in mobile and pervasive computing
2. To illustrate architecture and protocols in pervasive computing and to identify the trends and latest development of the technologies in the area
3. To give practical experience in the area through the design and execution of a modest research project
4. To design successful mobile and pervasive computing applications and services
5. To expose to the wearable computing and security expects.
6. To learn to develop applications in mobile and pervasive computing environment

Course Details:

Unit 1

(6 Hrs)

Title- INTRODUCTION TO PERVASIVE COMPUTING

U1.1

Pervasive Computing and Its significance, Principles of Pervasive Computing , Categories of Pervasive computing, Research trends in pervasive computing and networking, Applications and services

U1.2

Self Study: Personal Communications Services (PCS): PCS Architecture

Unit II

(9 Hrs)

Title- INTRODUCTION TO MOBILE COMPUTING AND WIRELESS NETWORKING

U2.1

Mobility management, Global System for Mobile Communication (GSM): Overview, Architecture, Network signaling, Channels, Mobility Management. General Packet Radio Services (GPRS): Architecture, GPRS Interfaces, Network Protocols

Wireless LAN (WLAN): Application, Requirement.

U2.2

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Self Study: Migration to 3G Networks IMT 2000 and UMTS, UMTS Architecture.

Unit III

(7 Hrs)

Title- SENSOR AND MESH NETWORKS

U3.1

Mobile Agent Technology, Sensor Networks and Its Role in Pervasive Computing, Collaboration and Interoperability among Sensor Networks Applications, Models for Service and Resource Discovery in Pervasive Computing, Pervasive Learning Tools and Technologies , Service management in pervasive Computing Environments, Multi-Hop Cognitive Radio Networks-An Opportunistic Pervasive Networking Paradigm, Smart Devices, Systems and Intelligent Environments, Autonomic and Pervasive Networking.

U3.2

Self Study: Wireless Sensor Cooperation for a Sustainable Quality of Information, Pervasive Networking and Communication.

Unit IV

(7 Hrs)

Title- WEARABLE COMPUTING and SECURITY

U4.1

Wearable Computing and Sensor Systems for Healthcare: Health BAN- Medical and Technological Requirements-Wearable Sensors .Standards and Implementation of Pervasive Computing Applications, Pervasive Networking Security, Security and privacy in Pervasive Networks, Understanding Wormhole Attacks in Pervasive Networks.

U4.2

Self Study: An Experimental Comparison of Collaborative Defense Strategies for Network Security.

Unit V

(7Hrs)

Title- APPLICATION DEVELOPMENT

U5.1

An Adaptive Architecture of Service Component for Pervasive Computing On Probabilistic k-Coverage in Pervasive Wireless Sensor Networks, Performance Evaluation of Pervasive Networks Based on WiMAX/LTE Networks, Implementation Frameworks for Mobile and Pervasive Networks.

U5.2

Self Study: On the Usage of Overlays to Provide QoS Over IEEE 802.11b/g/e Pervasive and Mobile Networks. Case Studies.

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Text Books

T1. “Fundamentals of Mobile and Pervasive Computing”, Frank Adelstein Sandeep K. S. Gupta Golden G. Richard III Loren Schwiebert, McGraw-Hill, 2005

T2. “Ubiquitous Computing: Smart Devices, Environments and Interactions”, Stefan Poslad, Wiley, 2009

Reference Books

R1. “Mobile Computing: Technology, Applications and Service Creation”, 2nd , Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, Tata McGraw Hill, 2010.

R2. “Pervasive Computing: Technology and Architecture of Mobile Internet Applications”, John Wiley, Jochen Burthardt et al, Pearson Education, 2003

R3. “Pervasive Computing and Networking”, Mohammad s. Obaidat et al, Wiley.

Course Outcomes:

Upon completion of the course, graduates will be able –

CO1: to analyze a basic architecture for a pervasive computing environment.

CO2: to design and allocate the resources on the 3G-4G wireless networks.

CO3: to analyze the role of sensors, mesh networks and smart devices in pervasive computing environment.

CO4: to develop and analyze mobile computing application based wearable computing and security of pervasive networks.

CO5: to deploy the architecture and context information for application development in a pervasive computing environment.

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COURSE CODE: CS42376

REF NO: To be filled by CD office

Pervasive Computing Lab

Credits: 1

Teaching Scheme: - Laboratory 2 Hrs/Week

Prerequisites:

3. Computer Programming
4. Computer Networks and Data communication

Objectives:

- To introduce the characteristics, basic concepts and systems issues in mobile and pervasive computing
- To illustrate architecture and protocols in pervasive computing and to identify the trends and latest development of the technologies in the area
- To give practical experience in the area through the design and execution of a modest research project
- To design successful mobile and pervasive computing applications and services
- To expose to the wearable computing and security aspects.
- To learn to develop applications in mobile and pervasive computing environment

Course Details:

- Explore Simulation tracking and activity recognition (STAR) using many anonymous sensors
- Explore Simulation tracking and activity recognition (STAR) using Binary sensors
- Programs on
 - Challenges in Pervasive Security
 - WiMAX Networks
- Programs on
 - Performance Evaluation of Pervasive Networks
 - Performance Evaluation of Pervasive Networks based on WiMAX Networks

Course Outcomes:

Upon completion of the course the graduate students will be able to

CO1: Analyze a basic architecture for a pervasive computing environment

CO2: Able to Analyze the role of sensors, mesh networks and smart devices in pervasive computing environment

CO3: Able to Develop and analyze mobile computing application based wearable computing and security of pervasive networks

CO4: Ability to deploy the architecture and context information for application development in a pervasive computing environment

Text Books

T1. "Fundamentals of Mobile and Pervasive Computing", Frank Adelstein Sandeep K. S. Gupta Golden G. Richard III Loren Schwiebert, McGraw-Hill, 2005

T2. "Ubiquitous Computing: Smart Devices, Environments and Interactions", Stefan Poslad, Wiley, 2009

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COURSE CODE:CS42170

REF NO: _____

Computer Graphics

Credits: 3

Teaching Scheme: - Theory 3 Hrs/Week

1. Computer Programming.
2. Design & Analysis of Algorithms.

Objectives:

1. Estimate hardware issues related to computer graphics in order to determine the significant software interfaces to realize graphical solutions.
2. Utilize algorithms to implement graphics primitives to perform geometric transformations.
3. Interpret graphical objects hierarchies in the design of graphics applications.
4. Defend the formulized solutions incorporating graphical algorithms in order to judge the complexity levels.
5. Derive interpretations from the animations generated for the identified problem.
6. Devise and frame new set of algorithmic principles so as to envisage scientific solutions useful to computing community.

Course Details:

Unit 1

Title- Basic Concepts

(06 Hrs)

U1.1.

Graphics Primitives: Introduction to computer graphics, Display adapters, Display modes, Pixel, Frame Buffer, Display file structure, Display file interpreter, Raster scan & random scan displays, Aspect Ratio. Mathematical foundations: Lines and line representations, Vectors, Intersection of lines, Normalized Device Coordinates. Scan conversions: DDA and Bresenham's line drawing algorithms and Bresenham and Midpoint circle drawing algorithms. Introduction to OpenGL and its benefits.

U1.2. Self Study: Bresenham's line drawing algorithm using OpenGL. Display devices, Interactive devices.

Unit 2

Title – Polygons and 2D Transformation

(06Hrs)

U2.1.

Polygons: Introduction, Types of polygons, Inside-outside test of polygon, Polygon filling: Flood fill, Boundary fill, Edge fill, Scan line fill algorithm. 2D Transformations: Introduction, Basic transformations such as- Scaling, Rotation, Translation, Homogeneous coordinates for transformations, Other transformations like – Reflection, Shearing Transformations, Transformations about an arbitrary point, Inverse transformations.

U2.2. Self Study: Numerical problems on transformation, Problems on 2D transformation.

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Unit 3

Title – Clipping, Animation and Aliasing

(06 Hrs)

U3.1

Windowing and Clipping: Introduction, viewing transformation, Line clipping: CohenSutherland algorithm, Mid-point line clipping algorithm, Polygon clipping: Sutherland, Hodgeman algorithm, Weiler Atherton algorithm, Text clipping. Aliasing and Antialiasing, Character Generation techniques. Halftoning and dithering.

Computer Animation: Types of Animation, Key frame Vs. Procedural Animation, methods of controlling Animation, Morphing.

U3.2.Self Study: Liang-Barsky algorithm,Interior and Exterior clipping.

Unit 4

Title – 3D Transformations and Projections

(06 Hrs)

U4.1

3D Transformations: Introduction, 3D point representation, Left handed system, Right handed system, Basic 3D transformations- Scaling, Rotation, Translation, Matrix representation, Derivation of Rotation matrices along the main axis, Rotation about anarbitrary axis, Reflection transformation with respect to main axes. Projection: Projection concept, parallel and perspective projections, Viewing parameters, 3D windowing and clipping.

U4.2. Self Study: Problems based on 3D transformations

Unit 5

Title- Hidden Surfaces, Curves and Fractals

(06 Hrs)

U5.1

Introduction, Back-face removal algorithm, Z buffers, Painters algorithm, Scan line algorithm for Depth Comparison, Curve generation, Curve continuity, Interpolation, Spline curve representation, B Spline Curves, Bezier Curves, Fractals, Fractal lines.

Introduction to light, Light Illumination models (Diffuse, Ambient, Specular), Point source illumination, Shading Algorithms (Phong, Gourad), Color, RGB Color Model.

U5.2

Self Study: Fractal surfaces, CMY and HSV color

Note: Five assignments to be given to the students on self study, comprising of one assignment from each unit.

Text Books:

1. “Computer Graphics with Open GL” (4th Edition) D. Hearn, M. Baker, Warren Carithers, Pearson Education, 2013,ISBN 81-7808-794-4.

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2. “Procedural Elements for Computer Graphics”, D. Rogers, 5th Edition, Tata McGraw-Hill Publication, 2001, ISBN 0-07-047371-4.

Reference Books:

1. “Computer Graphics”, S. Harrington, 2nd Edition, McGraw-Hill Publications, ISBN 0 - 07 -100472 -6.
2. “Computer Graphics Principles and Practice”, J. Foley, V. Dam, S. Feiner, J. Hughes, 2nd Edition, Pearson Education, 2003, ISBN 81-7808-038-9.

Course Outcomes:

Upon completion of the course, graduates will be able to –

1. Review basics of computer graphics, different graphics systems and applications of computer graphics.
2. Analyze various algorithms for scan conversion and filling of basic objects, analysis and use of geometric transformations on various composite objects.
3. Extract scene with different clipping methods and its transformation to graphics display device, by applying different antialiasing methods.
4. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
5. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: CS42370

REF NO: To be filled by CD office

Computer Graphics Lab

Credits:01

Teaching Scheme: - Laboratory 02Hrs/Week

Prerequisites:

- 1) Computer Programming.
- 2) Linux OS.

Objectives:

- To understand basics of computer graphics.
- To give more emphasis on implementation aspect of Computer Graphics Algorithm.
- To prepare the student for advance courses like Multimedia / Image Processing.

Course Details:

List of Practicals

1. Write a Program to implement DDA and Bresenham Line drawing algorithm.
2. Write a Program to implement Bresenham's Circle drawing algorithm.
3. Write a Program to implement Polygon fill algorithm.
4. Write a Program to implement Scaling, rotation and translation of a 2D object.
5. Write a program to achieve animation by using segmentation.
6. Write a Program to implement Cohen Sutherland line clipping algorithm.
7. Write a Program to implement Polygon clipping algorithm.
8. Write a Program to implement Scaling, reflection about planes and axes of a 3D object.
9. Write a Program to draw a Bezier curve.
10. Implementation of Fractal Line and Surface Algorithm and familiarity with OpenGL.

Text Books:

1. "Computer Graphics with Open GL" (4th Edition) D. Hearn, M. Baker, Warren Carithers, Pearson Education, 2013, ISBN 81-7808-794-4.
2. "Procedural Elements for Computer Graphics", D. Rogers, 5th Edition, Tata McGraw-Hill Publication, 2001, ISBN 0-07-047371-4.

Reference Books:

1. "Computer Graphics", S. Harrington, 2nd Edition, McGraw-Hill Publications, ISBN 0 - 07 -100472 -6.
2. "Computer Graphics Principles and Practice", J. Foley, V. Dam, S. Feiner, J. Hughes, 2nd Edition, Pearson Education, 2003, ISBN 81-7808-038-9.

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Course Outcomes:

Upon completion of the course, graduates will be able to –

1. Review basics of computer graphics, different graphics systems and applications of computer graphics.
2. Analyze various algorithms for scan conversion and filling of basic objects, analysis and use of geometric transformations on various composite objects.
3. Extract scene with different clipping methods and its transformation to graphics display device, by applying different antialiasing methods.
4. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
5. Render projected objects to naturalize the scene in 2D view and use of illumination models for this

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: IT42180

REF NO: To be filled by CD Office

Software Testing

Credits: 3

Teaching Scheme:- Theory 3 Hrs/Week

Prerequisite:

Object-Oriented Concepts, Software Engineering.

OBJECTIVES:

1. To know the behaviour of the testing techniques to detect the errors in the software
2. To understand standard principles to check the occurrence of defects and its removal.
3. To learn the functionality of automated testing tools
4. To understand the models of software reliability.

COURSE DETAILS:

UNIT I

(7 hours)

Title – TESTING ENVIRONMENT AND TEST PROCESSES

World-Class Software Testing Model – Building a Software Testing Environment - Overview of Software Testing Process – Organizing for Testing – Developing the Test Plan – Verification Testing – Analyzing and Reporting Test Results – Acceptance Testing.

Levels of Testing - Unit Testing – Integration Testing - Defect Bash Elimination. System Testing - Usability and Accessibility Testing – Configuration Testing - Compatibility Testing.

Self Study- Operational Testing – Post Implementation Analysis, Agile Testing (Test Plan, Strategies).

UNIT II

(9 hours)

Title – TESTING TECHNIQUES

Using White Box Approach to Test design - Static Testing Vs. Structural Testing – Code Functional Testing – Coverage and Control Flow Graphs, Coverage based testing techniques, McCabe's Cyclomatic Complexity, Mutation Testing, Data flow testing – Using Black Box Approaches to Test Case Design – Equivalence partitioning, BVC, Random Testing – Requirements based testing – Decision tables – State-based testing – Cause-effect graphing – Error guessing

Non functional Testing like Compliance Testing, Load Testing, Performance Testing and Security Testing.

Self Study- Case study for White box testing and Black box testing techniques. Non functional Testing like Endurance Testing, Recovery Testing, Scalability Testing.

UNIT III

(7 hours)

Title – INCORPORATING SPECIALIZED TESTING RESPONSIBILITIES

Testing Client/Server Systems – Rapid Application Development Testing – Testing in a Multiplatform Environment – Testing Software System Security - Testing Object-Oriented Software – Object Oriented Testing – Testing Web based systems – Web based system – Web Technology Evolution – Traditional Software and Web based Software.

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Self Study- Challenges in Testing for Web-based Software – Testing a Data Warehouse - Case Study for Web Application Testing.

UNIT IV

(7 hours)

Title – TEST AUTOMATION

Selecting and Installing Software Testing Tools - Software Test Automation – Skills needed for Automation – Scope of Automation – Design and Architecture for Automation – Requirements for a Test Tool – Challenges in Automation.

Self Study- Tracking the Bug – Debugging – Case study using Bug Tracking Tool.

UNIT V

(7 hours)

Title – SOFTWARE TESTING AND QUALITY METRICS

Testing Software System Security - Six-Sigma – TQM - Complexity Metrics and Models – Quality Management Metrics - Availability Metrics - Defect Removal Effectiveness - FMEA - Quality Function Deployment – Taguchi Quality Loss Function – Cost of Quality.

Self Study- Case Study for Complexity and Object Oriented Metrics.

TEXT BOOKS:

- T1. William Perry, “Effective Methods of Software Testing”, Third Edition, Wiley Publishing.
- T2. Srinivasan Desikan and Gopaldaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education,.

REFERENCES:

- R1. Naresh Chauhan , “Software Testing Principles and Practices ” Oxford University Press , New Delhi .
- R2. Dale H. Besterfiled et al., “Total Quality Management”, Pearson Education Asia, Third Edition, Indian Reprint .
- R3. Stephen Kan, “Metrics and Models in Software Quality”, Addison – Wesley, Second Edition.
- R4. Llène Burnstein, “ Practical Software Testing”, Springer International Edition.
- R5.Renu Rajani,Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill.

COURSE OUTCOMES:

Upon completion of the course, graduates will be -

- CO1:** Able to apply testing techniques to test the software to deliver a product free from bugs
- CO2:** Able to evaluate the web applications using bug tracking tools.
- CO3:** Able to investigate the scenario and select the proper testing technique
- CO4:** Able to explore the test automation testing concepts and tools
- CO5:** Able to apply standards such as TQM, Six Sigma to deliver quality product to the clients
- CO6:** Able to evaluate the estimation of cost, schedule based on standard metrics

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COURSE CODE: IT42380

REF NO: To be filled by CD Office

Software Testing Lab

Credit: 01

Teaching Scheme: Laboratory 02 Hrs / Week

Prerequisites:

Object-Oriented Concepts, Software Engineering, Knowledge of Java development IDE

Objectives:

1. To make the student familiar with test case preparation.
2. To teach the student to use open source tools for different testing techniques.

Course Details:

1. Study of mutation testing using Jumble tool.
2. Study of code coverage testing using Jabuti tool.
3. Study of performance testing using JMeter tool.
4. Study of security testing using Peach tool.
5. Study of web application testing using Selenium IDE, Selenium RC, Selenium Web Driver.

List of Practical:

Experiment No. 1: Deriving test cases using Jumble tool.

Experiment No. 2: Mutation testing using Jumble tool.

Experiment No. 3: Code coverage analysis and generation of test cases using Jabuti tool.

Experiment No. 4: Deriving complexity metrics using Jabuti tool.

Experiment No. 5: Deriving slicing metrics using Jabuti tool.

Experiment No. 6: Unit testing in Java environment using JUnit framework.

Experiment No. 7: Performance testing using JMeter.

Experiment No. 8: Conduction of web application testing and generation of test cases using Selenium IDE.

Experiment No. 9: Conduction of web application testing and generation of test cases using Selenium Remote Control (RC).

Experiment No. 10: Conduction of web application testing and generation of test cases using Selenium Web driver.

Experiment No. 11: Conduction of security testing using Peach tool.

Text Books:

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1. Software Testing: Principles and Practice by Gopalaswamy Ramesh and Srinivasan Desikan, Pearson Education
2. Foundations of Software Testing, by Dorothy Graham and Erik P. W. M. Veenendaal, Cengage

Reference Books:

1. Implementing Automated Software Testing by Bernie Gauf, Elfriede Dustin, and Thom Garrett, Pearson Education
2. A Practitioner's Guide To Software Test Design by Lee Copeland, Artech House
3. Selenium. www.seleniumhq.org/download.
4. Jumble. <http://agile.csc.ncsu.edu/SEMaterials/tutorials/jumble/site2>.
5. JMeter. www.jmeter.apache.org/download_jmeter.org.
6. Peach Fuzzer. <https://www.peachfuzzer.com/resources/peachcommunity/>
7. Windows Debugger. <https://developer.microsoft.com/en-us/windows/downloads/windows-10-sdk>.
8. Jabuti. <https://github.com/jacksonpradolima/JaBUTi4Run/tree/master/jabuti>.

Course Outcomes:

Upon completion of the course, graduates will be able to-

1. Identify the usage of various testing tool.
2. Derive test cases based on various testing tool.
3. Generate different complexity metrics using tools.
4. Use JUnit framework for unit testing.
5. Design and conduct test suites using Selenium IDE, Selenium RC, Selenium Webdriver.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: IT42181

REF NO: To be filled by CD Office

Natural Language Processing

Credits: 3

Teaching Scheme:-Theory 3 Hrs/Week

Prerequisite:

1. Data Structures
2. Theory of Computation
3. Programming Skills

Course Objective:

1. To study the computing systems that can process, understand, or communicate in human language.
2. Understanding of the computational properties of natural languages and commonly used algorithms for processing linguistic information.

Unit – 1

(06Hrs)

Introduction and Overview

What is Natural Language Processing? Ambiguity and uncertainty in language. The Turing test. Phases in natural language processing. Applications such as information extraction, question answering, and machine translation. The problem of ambiguity. The role of machine learning. Brief history of NLP.

Regular Expressions

Chomsky hierarchy, regular languages, and their limitations. Finite-state automata. Practical regular expressions for finding and counting language phenomena. A little morphology.

Context Free Grammars

Constituency, CFG definition, use and limitations. Chomsky Normal Form. Top-down parsing, bottom-up parsing, and the problems with each. The desirability of combining evidence from both directions.

Unit – 2

Non-probabilistic Parsing

Efficient CFG parsing with CYK, dynamic programming algorithm. Earley parser. Designing a little grammar, and parsing with it on some test data.

Semantic Analysis

Lexical semantics and word-sense disambiguation. Compositional semantics. Semantic Role Labeling and Semantic Parsing.

Unit - 3

Probability

Introduction to probability theory--the backbone of modern natural language processing. Events, and counting. Joint and conditional probability, marginally, independence, Bayes rule, combining evidence. Examples of applications in natural language.

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Language modelling and Naive Bayes

Probabilistic language modelling and its applications. Markov models. N-grams. Estimating the probability of a word, and smoothing. Generative models of language. Application: building an automatically-trained email spam filter, automatically determining the language (English, French, German, Dutch etc.)

Unit – 4

Part of Speech Tagging

The concept of parts-of-speech, examples, usage. The Penn Treebank and Brown Corpus. Probabilistic (weighted) finite state automata.

Neural Network Approach

Perceptron and back propagation for Pattern Recognition and Machine Learning. Understanding of LSTM Recurrent Neural Networks

Unit - 5

Applications of NLP and Machine Translation

Spell-checking, Summarization Information Retrieval- Vector space model, term weighting, homonymy, polysemy, synonymy, improving user queries. Machine Translation– Overview.

Textbook:

1. Daniel Jurafsky and James H Martin, "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition", Pearson Education India; 2 edition (2013)
2. Mohamed Zakaria Kurdi, "Natural Language Processing and Computational Linguistics: Speech, Morphology and Syntax (Cognitive Science)", Wiley Publisher

Reference Books:

1. Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995.
2. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
3. Jurafsky, Dan and Martin, James, Speech and Language Processing, Second Edition, Prentice Hall, 2008.
4. Manning, Christopher and Heinrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.
5. Steven Bird, Ewan Klein, and Edward Loper, Natural Language Processing with Python, OReily 2009, first Ed.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: MB43102

REF NO: _____

ENTREPRENEURSHIP DEVELOPMENT

Credits: 3

Teaching Scheme: - Theory 3 Hrs/Week

Prerequisites: Students pursuing B.Tech

Course Objectives:

- Identify and apply the elements of entrepreneurship and entrepreneurial processes.
- Recognize the importance of entrepreneurs and their role in economic growth;
- Develop skills to identify Business Opportunity.

Course Details:

Unit 1 Understanding Entrepreneurship

(8Hrs)

U1.1 - Concept of Entrepreneurship: Meaning, Definition, Motivation for Economic Development, Entrepreneurial Achievement: Case Study, Enterprise and Society, Entrepreneurial Traits and Skills, Environmental Dynamics and Change

U1.2 - Self-Study Topic - Mind vs Money in commencing new venture

Unit 2 Entrepreneurial Process

(3Hrs)

U2.1 - Step by Step approach to Entrepreneurial Start Up, Decision for Entrepreneurial Start Up

U2.2 - Self- Study Topic- Entrepreneurial Success & Failures Factors

Unit 3 Setting Up of a Small Business Enterprise

(8Hrs)

U3.1 - Identifying Business Opportunity, Environmental pollution and allied regulatory and non-regulatory clearances, Formalities for setting up small enterprises in service sectors, Writing Business Plan Format, Components of a Business Plan

U3.2. Self-Study Topic- Determining Bankability of the Project

Unit 4 Institutional Support for SME

(6Hrs)

U4.1 - Central/State Level Institutions promoting SME, Financial Management in Small Business

U4.2 - Self-Study Topic - Marketing Management Problems and Strategies

Unit-5 Problems and Sickness in Small Enterprises

(5Hrs)

U5.1 – Problems of HRM, Relevant Labour Laws, Causes of Sickness, Govt. Policies on revival of Sickness and remedial measures

U5.2 - Self-Study Topic: Symptoms of Sickness

Course Outcome:

After completion of the course, the students would be able to:

1. Demonstrate the ability to provide a self analysis in the context of an Entrepreneurial Career.
2. Identify entrepreneurial opportunities and challenges for a new business venture.
3. Develop a well presented Business Plan that is feasible and sustainable.

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Text Books:

- T1. “Entrepreneurship”, R.D. Hisrich, M.P. Peters, D.A. Shepherd, Tata McGraw Hill, 6th Edition,2011
- T2. “Entrepreneurship”, David H. Holt, PHI Learning Private Limited, 2011
- T3. “Entrepreneurship Development Small Business Enterprises”, Poornima M Charantimath, Pearson,2012, Seventh Impression

Reference Books

- R1. “Entrepreneurship Development”, S.S. Khanka, S.Chand, 4th Edition 2010
- R2. “Entrepreneurship Development and Management”, Dr. Vasant Desai and Dr. Kulveen Kaur , Himalaya Publishing House, First Edition,2013.
- R3. “Entrepreneurship Development”, Dr. S.L. Gupta, Dr. Arun Mittal, International Book House, Second Edition,

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COURSE CODE: MB43102

REF NO: _____

Entrepreneurship Development Tutorial

Credits: 03

Teaching Scheme: - Tutorial 01 Hrs/Week

Prerequisites: Students pursuing B.Tech

Objectives:

- Identify and apply the elements of entrepreneurship and to entrepreneurial processes
- Recognize the importance of entrepreneurship and identify the profile of entrepreneurs and their role in economic growth;
- Use the entrepreneurial mind-set and behave responsibly and ethically in their roles as entrepreneurs.
- Analyze the business environment, opportunity recognition, and the business idea-generation process.

Course Details:

List of Contents

Tutorial No. 1: Role of Entrepreneur in Economic Development

Tutorial No. 2: Environmental Dynamics and Change

Tutorial No. 3: Entrepreneurial Achievement

Tutorial No. 4: Entrepreneurial decision making

Tutorial No. 5: Entrepreneurial Start up

Tutorial No. 6: Formalities in setting up small enterprises in manufacturing and services

Tutorial No. 7: Components of Business Plan

Tutorial No. 8: Bankability of the project

Tutorial No. 9: Problems of HRM- Relevant Labour Laws

Tutorial No. 10: Causes and Symptoms of sickness

Tutorial No. 11: Cures of Sickness

Tutorial No. 12: Remedial Measures of sickness in small enterprises

Text Books:

- T1. "Entrepreneurship", R.D. Hisrich, M.P. Peters, D.A. Shepherd, Tata McGraw Hill, 6th Edition, 2011
- T2. "Entrepreneurship", David H. Holt, PHI Learning Private Limited, 2011
- T3. "Entrepreneurship Development Small Business Enterprises", Poornima M Charantimath, Pearson, 2012, Seventh Impression

Reference Books

- R1. "Entrepreneurship Development", S.S. Khanka, S.Chand
- R2. "Entrepreneurship Development and Management", Dr. Vasant Desai and Dr. Kulveen Kaur, Himalaya Publishing House, First Edition, 2013.
- R3. "Entrepreneurship Development", Dr. S.L. Gupta, Dr. Arun Mittal, International Book House, Second Edition,

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COURSE CODE: MB43105

REF NO: _____

Organizational Behaviour

Credits: 03

Teaching Scheme: -Theory 3Hrs/Week

Prerequisites: Students shall have the ability to understand human behaviour.

Course Objectives:

1. To develop an understanding of the behavior of individuals, and groups inside organizations.
2. To enhance skills in understanding and appreciating individuals, interpersonal and group process for increased effectiveness both within and outside of organizations.

Course Details:

Unit1: Foundation for Organizational Behaviour

(4hrs)

U 1.1: Definition and Meaning of OB, Nature and Scope of OB, why study OB, Disciplines contributing

to OB, Various man Models of OB, Challenges for OB.

U 1.2: Self Study-Importance OB

Unit 2: Individuals in the Organisation

(8hrs)

U 2.1. Personality - Concept, Determinants, personality Traits, Perception – Concept, Process, Distortion, Selectivity, Implications. Learning – Theory, Reinforcement Principles, Behaviour Modification, Attitude and Values – Formation, Measurement,

U 2.2: Case Study- A case study on Attitude change.

Unit 3: Groups in the Organization

(8hrs)

U 3.1: Groups in the Organization: Group – Concepts, Features, Types, Stages, Group Cohesiveness, Communication – Process, Barriers, Effective Methods. Leadership – Concept, Theories – Trait, Behavioural, Situational, Styles, importance, Gateways and Barriers to Communication,

U 3.2. Self Study Topic: Communication as a tool to improve interpersonal effectiveness,

Unit 4: Organizational Culture and Change

(6hrs)

U 4.1 Organizational cultures: Meaning & definition of Organizational Culture, Creating and Sustaining Organizational Culture, Types of culture (Strong vs. Weak, Formal vs. Informal culture)

Organizational Change- Meaning, Planned Change, Force-field analysis, Three Phase of Change process.

U 4.2 Self Study Topic: Importance of Change,

Unit 5: Human Resource policies and Practices

(4hrs)

U 5.1 Introduction to Human Resource Management: Concept of HRM, Human Resource Planning, Recruitment, Selection, Orientation, Training and Development, performance

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Appraisal

U 5.2 Case Study: A case study on Performance appraisal.

Course Outcome:

After completion of this course students would able to:

1. Understand the concept and importance of OB
2. Understand the various factors determining human personality.
3. Application of behavioral aspects of individual and groups in organizational context.
4. Understand the impact of culture on organizational change.
5. Realise the significance of different key aspects of HRM in an organization.

Text Books:

T-1 Foundations, theories and analyses, John B. Miner, Oxford, 1st ed, 2002.

T-2 Organizational Behavior, K. Aswathapa, HPH, 10th, 2012

T-3 Organizational Behaviour, V S P Rao, Excel Books, 1st ed, 2009

T-4 Strategic Human Resource Management, Rajesh Viswanathan, HPH, 1st ed., 2010

Reference Books

R-1 Organizational Behaviour, Fred Luthans, McGraw Hill, 3rd ed, 2010

R-2 Understanding Organizational Behavior, Parek, Oxford, 3rd ed, 2011

R-3 Organizational Behavior, Stephen P. Robbins, Timothy A. Judge, Pearson, 16th ed, 2015

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COURSE CODE: MB43103

REF NO: _____

MARKETING MANAGEMENT

Credits: 3

Teaching Scheme: - Theory 3 Hrs/Week

Prerequisites: Students shall have the knowledge of general management.

Objectives:

The course aims at introducing the basic concepts of marketing to the undergraduate students in engineering. The learning shall help the students in better designing, manufacturing and selling product/service packages keeping competitive market, customers and cost in view.

Course Details:

Unit 1 – Concepts of Marketing Management

(06Hrs)

U 1.1 - Marketing Management: Concept, Process, Functions and relevance in the current context; Marketing Environment: Elements of micro and macro environment; Competition Analysis: Identifying and analyzing competitors, Porter's Five forces model.

U1.2 – Case Study – A case study on Marketing Success Stories of Indian Brands

Unit 2 – Consumer Behaviour & STP Strategies

(06Hrs)

U 2.1 Consumer Behavior: Factors influencing consumer behaviour, consumer decision process. Concept of Marketing Mix, Market Segmentation, Targeting and Positioning: Definition, Bases of Segmentation, Targeting and Positioning.

U2.2 – Case Study – A case study on Price-Quality Value Proposition

Unit 3 – Fundamentals of Product and Pricing

(08Hrs)

U 3.1 - Product Life Cycle, New Product Development Process; Branding Concepts: Brand Equity, Packaging and Labeling, Product-Mix and Product Line; Pricing Decision: Objectives and Factors influencing pricing, Pricing methods and strategies.

U3.2 – Case Study – A case study on Brand/Product Differentiation

Unit 4 - Fundamentals of Promotion and Place

(06Hrs)

U 4.1 - The Marketing Communication process, Promotion Mix – Introduction, Concept, elements of promotion mix; Channels of Distributions – Meaning, Concept, Types of intermediaries and Functions of distribution channels.

U4.2 – Case Study – A case study on Promotion and Positioning success

Unit 5 - Marketing Planning and Control

(04Hrs)

U 5.1 - Designing Distribution Channels; Concept of Supply Chain Management; Trends in Marketing (Concept): Customer Relationship Management, E-marketing, Rural Marketing and Service Marketing.

U5.2 – Case Study – A case study on Experience Marketing

Course Outcome:

After the completion of the course, the students would be able to:

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1. Have a basic understanding of the key concepts in marketing and application of marketing theories in managerial practices.
2. Understand basic consumer psychology and analyze consumption patterns of buyers.
3. Formulate product & pricing related decisions and strategies.
4. Develop promotional strategies and identify the role of channel of distribution in smooth flow of products/services.
5. Identify emerging areas and recent developments in marketing trends.

Text Books:

T1 - Etzel, Walker, Stanton and Pandit, Marketing, 14/e, Tata McGraw Hill.

T2 - Saxena, "Marketing Management" Tata McGraw Hill, 4/e.

T3 - Karunakaran "Marketing Management", Himalaya Publishing House, 2010/e.

Reference Books -

R1 - Grewal, Levy, 'Marketing' Tata McGraw Hill, special Indian edition.

R2 - Kotler, Keller, Koshy and Jha, "Marketing Management", 13/e, Pearson Education.

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COURSE CODE: EC43170

REF NO: _____

Digital Signal Processing

Credits: 3-0-0

Teaching Scheme: - Theory 3 Hrs/Week

Prerequisites: Mathematics-I, Mathematics-II, Signals and Systems

Co-requisites: Digital Communication Technique

Post requisite: Advanced Digital Signal Processing, Adaptive Signal Processing

Objectives: The course Digital Signal Processing aims to provide with the concept of transformation techniques used to get the hidden information. Comparison of different digital filters like FIR and IIR are studied with demonstration of its behaviors. The students will be able to analyze the multi-rate signal processing. Students can be able to differentiate the properties of fixed filters and adaptive filters.

Course Details:

Unit 1: The Discrete Fourier Transform and its Efficient Computation (08 Hrs)

- U1.1.** Frequency Domain sampling: The Discrete Fourier Transform, Properties of the DFT, Linear Filtering method based on DFT, Discrete Cosine Transform, Efficient Computation of DFT: Fast Fourier Transform : Radix-2 FFT Algorithms-Decimation in Time, Decimation in Frequency, Implementation of FFT Algorithm.[T1: Chapters 7.1.1,7.1.2,7.1.3,7.2.1,7.2.2,7.3,7.5, 8.1.1,8.1.3,8.1.6]
- U1.2.** Relationship of DFT to other Transforms, Additional DFT Properties, Applications of FFT Algorithm.[T1: Chapters 7.1.4, 7.2.3,8.2]

Unit 2: Implementation of Discrete Time Systems (06 Hrs)

- U2.1.** Structures for the Realization of FIR Systems, Structures for FIR Systems-Direct Form, Cascade Form, Frequency Sampling, Structures for IIR Systems- Direct Form Structures, Signal Flow Graphs and Transposed Structures, Cascade- Form Structures, Parallel-Form Structures [T1: Chapters 9.2.1,9.2.2,9.2.3,9.3.1,9.3.2,9.3.3,9.3.4]
- U2.2.** Structure for Realization of FIR Systems by Lattice structure. Lattice and Lattice-Ladder Structures of IIR Systems.[T1: Chapters 9.2.4,9.3.5]

Unit 3: Design of Digital Filters (10 Hrs)

- U3.1.** General Considerations: Causality and its implications, Characteristics of Practical Frequency-Selective Filters, Design of FIR Filters- Symmetric and Anti-symmetric FIR Filters, Design of Linear Phase FIR Filters using Windows(Rectangular, Bartlett), Design of Linear Phase FIR Filters by the Frequency-Sampling Method, Frequency Transformations-Frequency transformations in Analog Domain, Design of IIR Filters- Characteristics of commonly used analog filters, IIR filter design by Impulse Invariance, IIR Filter design by the Bilinear Transformation. [T1: Chapters 10.1.1,10.1.2,10.2.1,10.2.2,10.2.3,10.4.1,10.3.2,10.3.3]
- U3.2.** Design of Linear Phase FIR Filters using Windows(Hanning, Hamming, Blackman)Frequency Transformation in Digital Domain, IIR Filter design by the

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Approximation of Derivatives. [T1: Chapters 10.2.2, 10.4.2, 10.3.1]

Unit 4: Adaptive Filters

(06 Hrs)

- U5.1.** Applications of Adaptive Filters-System Identification or System Modeling, Adaptive Channel Equalization, Echo Cancellation in Data Transmission over Telephone Channels, Adaptive Line Enhancer, Adaptive Noise Cancelling. Adaptive Direct-Form FIR Filters-The LMS Algorithm: Minimum mean square error criteria, The LMS Algorithm, properties of the LMS Algorithm.[T1: Chapters 13.1.1,13.1.2,13.1.3,13.1.5,13.1.6,13.2.1,13.2.2,13.2.4]
- U5.2.** Applications of adaptive filters- Linear Predictive Coding of speech signals, Adaptive arrays, Related Stochastic Gradient Algorithms.[T1: Chapters 13.1.7,13.1.8,13.2.3]

Unit 5: Multirate Digital Signal Processing

(06 Hrs)

- U4.1.** Introduction, Decimation by a Factor D, Interpolation by a Factor I, Implementation of Sampling Rate Conversion –Polyphase Filter Structures, Interchange of Filters and Downsamplers/Upsamplers, Multistage Implementation of Sampling Rate Conversion, sampling Rate conversion of Bandpass signals.[T1: Chapters 11.1,11.2,11.3,11.5.1,11.5.2,11.6,11.7]
- U4.2.** Applications of Multirate Signal Processing[11.9]

Text Books:

- T1. “Digital Signal Processing”, John G. Proakis, Dimitris G. Manolakis, Pearson, Fourth Edition, 2011

Reference Books

- R1. “Discrete-Time Signal Processing”, Alan V. Oppenheim, Ronald W. Schaffer, John R. Buck, Prentice Hall, Second Edition, 1989.
- R2. “Digital Signal Processing”, P. Ramesh Babu, Scitech, Second Edition, 2003.
- R3. “Applied Digital Signal Processing”, Dimitris Manolakis, Vinay Ingle, Cambridge University Press, First Edition, 2011.

Course Outcome:

Upon successful completion of the course, the students will be able to

- CO1:** Apply Discrete Fourier Transform and Fast Fourier Transform to analyze the discrete time signals.
- CO2:** Implementation and design of Digital Filters.
- CO3:** Analyze the multi-rate signal processing.
- CO4:** Read voluntarily to enhance the knowledge of Digital Signal Processing.

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COURSE CODE: EC43170

REF NO: To be filled by CD office

Digital Signal Processing Tutorial

Credits: 01

Teaching Scheme: - Tutorial 01 Hrs/Week

Prerequisites: Mathematics-I, Mathematics-II, Signals and Systems

Co-requisites: Digital Communication Technique

Post requisite: Advanced Digital Signal Processing, Adaptive Signal Processing

Objectives: The course Digital Signal Processing aims to provide with the concept of transformation techniques used to get the hidden information. Comparison of different digital filters like FIR and IIR are studied with demonstration of its behaviours. The students will be able to analyze the multi-rate signal processing. Students can be able to differentiate the properties of fixed filters and adaptive filters.

Course Outcome:

Upon successful completion of the course, the students will be able to

CO1: Apply Discrete Fourier Transform and Fast Fourier Transform to analyze the discrete time signals.

CO2: Implementation and design of Digital Filters.

CO3: Analyze the multi-rate signal processing.

CO4: Read voluntarily to enhance the knowledge of Digital Signal Processing.

Course Details:

List of Contents

To be filled in by concerned Department.

Tutorial No. 1: Linear filtering method based on DFT.

Tutorial No. 2: Radix-2 FFT Algorithms-Decimation in Time, Decimation in Frequency ,

Tutorial No. 3: Realization of FIR systems using frequency sampling structure ,

Tutorial No. 4: Realization of IIR systems using transposed structure.

Tutorial No. 5: Characteristics of practical frequency filter.

Tutorial No. 6: Design of FIR Filter

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Tutorial No. 7: Design of Analog filter using frequency transformation.

Tutorial No. 8: Design of IIR Filter.

Tutorial No. 9: Implementation of Sampling Rate Conversion,

Tutorial No. 10: Sampling rate conversion of band pass signals,

Tutorial No. 11: Adaptive channel equalization, System identification.

Tutorial No. 12: Minimum mean square error and LMS algorithm.

Text Books:

T1. “Digital Signal Processing”, John G. Proakis, Dimitris G. Manolakis, Pearson, Fourth Edition, 2011

Reference Books

R1. “Discrete-Time Signal Processing”, Alan V. Oppenheim, Ronald W. Schafer, John R. Buck, Prentice Hall, Second Edition, 1989.

R2. “Digital Signal Processing”, P. Ramesh Babu, Scitech, Second Edition, 2003.

R3. “Applied Digital Signal Processing”, Dimitris Manolakis, Vinay Ingle, Cambridge University Press, First Edition, 2011.

EIGHTH SEMESTER IT 2018-19 (PATTERN A-15)

COURSE CODE: MB43101

REF NO: To be filled by CD office

PRINCIPLES OF MANAGEMENT

Credits: 3

Teaching Scheme: Theory 3 Hrs/Week

Prerequisites: Students shall have the basic knowledge of functioning of business organisations.

Course Objectives:

The course aims at introducing the basic concepts of management and to give an overview of various functional areas of an organisation.

Course Details:

Unit 1 Introduction to Management (7Hrs)

U1.1 - Concept of Management; Nature and Scope of Management; Functions of Management; Levels and Types of Management; Roles and skills of Managers; Management is concerned with ideas, things and people; How a manager induces workers to put in their best.

U1.2 - Self-Study Topic – Good Managers are born, not made

Unit 2 Evolution of Management Thought (5Hrs)

U2.1- Contributions of management thinkers towards the field of management: F.W. Taylor, Henry Fayol, Elton Mayo, Mc Gregor, Peter Drucker, Chester Bernard and C.K. Prahlad.

U2.2- Self- Study Topic- Contribution of Rensis Likert towards the field of management

Unit 3 Marketing Functions (6Hrs)

U3.1- Concept of Marketing, The functional classification of marketing, Marketing mix, fundamental needs of customers, Advertising, Concept of Distribution Channels, role of distribution channels in marketing, Concept of Consumerism and Environmentalism.

U3.2. Self-Study Topic- *A case study on promotion strategy*

Unit 4 Financial Functions (5Hrs)

U4.1. Concept of Financial Management, Functions of Financial Management, Project Appraisal: Concept, Elements, Tools of Financial decision making, Overview of Working Capital.

U4.2. Self-Study Topic – Roles of Financial Manager

Unit-5 HRM Functions (7Hrs)

U5.1 – Human Resource Management: meaning, importance; Overview of Job Analysis, Job Description, Job Specification, Manpower Planning, Recruitment, Selection, Induction, Placement, Training and Development, Wage and Salary Administration, Performance Appraisal.

U5.2. Self-Study Topic: *A case study on Recruitment/Selection/Induction*

Course Outcome: After completion of the course the student would be able to:

1. Understand the fundamentals of management
2. Gain an insight into the management thoughts and its implication in practice.
3. Apply the theoretical aspect of marketing in present market scenario.
4. Understand the fundamentals of financial management and its significance in financial decision making.

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5. Gain an insight into the various HRM practices in organizations.

Text Books:

- T1. Business Organization and Management, CR Basu, McGrawHill Education, 1st Edition
- T2. Business Organization & Management, Tulsia, Pandey, Pearson, 7th Edition
- T3. Marketing Management, Kotler, Keller, Koshi, Jha, Pearson, 14th Edition

Reference Books

- R1. Financial Management, I.M. Pandey, Vikas, 10th Edition
- R2. Human Resource Management, Aswathapa, TMH, 7th Edition
- R3. Principles and Practice of Management, P.C. Rath, Seven Seas, 1st Edition, 2012