

**Scheme of Teaching and Examination for
6th Semester of 3 Years Diploma in Computer Science & Engineering**

Duration of Semester : **14 Weeks**
 Student Contact Hours : **36 Hrs**
 Total Marks : **800**

Effective from : 2017 -18 Session

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Industrial Engineering & Management	601	Theory	3	-	-	3	100	80	20	26	40
2.	Network Security	CSE 604	Theory	3	-	-	3	100	80	20	26	40
3.	Software Engineering & Tools	CSE 605	Theory	3	-	-	3	100	80	20	26	40
4.	Elective III	CSE 606/607/608	Theory	3	-	-	3	100	80	20	26	40
5.	Elective IV	CSE 609/610/611	Theory	3	-	-	3	100	80	20	26	40
6.	Network Security Lab	CSE 612	Sessional	-	-	2	-	50	30	20	-	25
7.	Software Engineering & Tools Lab	CSE613	Sessional	-	-	2	-	50	30	20	-	25
8.	Elective III Lab	CSE 614/615/616	Sessional	-	-	2	-	50	30	20	-	25
9.	Elective IV Lab	CSE 617/618/619	Sessional	-	-	2	-	50	30	20	-	25
10	Project Work	603	Sessional	-	-	4	-	50	30	20	-	25
11	Professional Practices	602	Sessional	-	-	4	-	50	30	20	-	25
Total Hours of Teaching per week :				15		16						

Elective III (Image Processing- CSE-606/ Cloud Computing-CSE 607/UML -CSE 608)

Elective IV (Animation & Multimedia- CSE609/Adv. Microprocessor- CSE 610/IoT-CSE-611)

Total Marks: Theory : Practical : Sessional :
 L : Lecture, T : Tutorial P : Practical

- Note:
1. Period of Class hours should be of 1 hrs duration as per AICTE norms.
 2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.
 3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.
 4. Board will depute examiner for Practical examination.
 5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Subject : Industrial Engineering & Management (Common Paper)
Subject Code : 601
Full Marks : 80+20= 100

L T P
3 0 0

Rationale:

After completion of three years of technical training, Polytechnic students are expected to enter in to the World of Work. The business environment is altogether different and new to the students. A proper introduction and understanding of Business Processes is therefore essential for all Polytechnic students. Management is a subject which deals with basics of Management science required to understand the processes the in Industrial & Commercial environment. This will enable the students of Polytechnic to become familiar and to understand various Business Organizational structures, their functioning and the Role these technicians will have to play in these setups with responsibilities.

Industrial Engineering is concerned with the design, improvement and installation of integrated systems of people, materials, equipment and energy. Polytechnic students must be able to analyze the use and cost of the resources of the organization in order to achieve the objective, i.e. to increase productivity, profits etc. and carryout the policies efficiently and effectively.

Objective:

The students will able to:

1. Familiarize environment in the world of work.
2. Explain the importance of management process in Business.
3. Identify various components of management.
4. Describe Role & Responsibilities of a Technician in an Organizational Structure.
5. Apply various rules and regulations concerned with Business & Social responsibilities of the technician.

Detailed Syllabus

1. **Productivity** : **02 Hrs**
Production and productivity, importance of productivity, factors affecting productivity, means of increasing productivity.

2. **Plant Layout and Material Handling :** **02 Hrs**
Definition of plant layout, objectives of good plant layout, principles of plant layout, types of plant layout, flow pattern, steps in planning the layout for a new enterprise, definition of material handling, functions and principles of material handling, material handling devices.
3. **Work Study :** **04 Hrs**
Definition, concept and need for work study, objectives of method study and work measurement, basic procedure/steps in method study, recording technique, critical examination, principles of motion economy, stop watch procedure for collecting time study data, including performance rating and allowances, work sampling.
4. **Production Planning and Control (PPC) :** **04 Hrs**
Definition and objectives of PPC, functions of PPC, routing, scheduling, loading, dispatching, production control definition and objectives, principle of sound production control system.
5. **Material, Purchase and Stores Management :** **04 Hrs**
Definition, functions& objectives of materials management, inventory control, economic order quantity (EOQ), ABC analysis. Objectives of purchasing department, buying techniques, purchasing procedure (steps involved in one complete purchasing cycle); functions of stores department, location and layout of stores, receipt and issue of materials.
6. **Quality Control and TQM :** **04 Hrs**
Meaning of quality and quality control, dimensions of quality, quality circle, concept and definition of TQM, elements of TQM, Kaizen, 5 'S' and six sigma.
7. **Management :** **04 Hrs**
Various definition, concept of management, levels of management, administration and management, scientific management by F. W. Taylor. Principles of management (14 principles of Henry Fayol). Functions of management - planning, organizing, coordinating, directing, controlling, decision making.
8. **Organizational Management :** **04 Hrs**
Organization - definition, steps in forming organization. Types of organization. Types of organization - line, line and staff, functions, project type. Departmentation- Organized and decentralized, authority and responsibility, span of control (management). Forms of ownership - proprietorship, partnership, joint stock company, co-operative society, govt. sector.
9. **Human Resource Management :** **06 Hrs**
Personnel Management – Introduction, definition, function. Staffing – Introduction to HR, Introduction to HR Planning, Recruitment procedure. Personnel- Training & Development – Types of training, Induction, Skill enhancement. Leadership & Motivation – Leadership-

Styles & types, Motivation- Definition, Intrinsic, &Extrinsic, Moslow's theory of Motivation and its significance. Safety Management – Causes of accident, Safety Procedures. Introduction, Objectives & feature of Industrial Legislation such as – Factory act, ESI act, Workman compensation act, Industrial dispute act and salary & wages.

10. **Financial Management** :

04 Hrs

Financial Management- Objectives & Functions. Capital Generation & Management- Types of capitals, Sources of finance. Budgets and accounts- Types of budgets, Production budget (including variance report), Labour budget, Introduction to Profit & Loss Accounts (Only concept), Balance sheet etc.

11. **Entrepreneurship** :

04 Hrs

Concept and definition of entrepreneur and entrepreneurship, factors influencing entrepreneurship, entrepreneurial characteristics, need for promotion of entrepreneurship and small scale industries, steps in setting up a small scale industrial enterprise.

References Books :

1. Industrial Engineering and Management by O. P. Khanna
2. Industrial Engineering and Production Management by M. Mahajan.
Publisher :Dhanpat Rai Publication (P) Ltd. New Delhi
3. Business Administration and Management by Dr. S. C. Saksena
Publisher :Sahitya Bhawan, Agra.

Subject : Network Security
Subject Code : CSE604
Total Hours : 42
Full Marks : 80 + 20 = 100

Contents:

1. Introduction 04 Hrs
Internet Architecture, How the Internet works (high-level overview), IP Address
2. TCP/IP Protocols, Vulnerabilities, Attacks, and Countermeasures 10 Hrs
Physical Layer: jamming attacks, Data Link Layer: ARP protocol and ARP cache poisoning, Network Layer: IP protocols, packet sniffing, IP Spoofing, IP fragmentation attacks, Network Layer: ICMP protocol and ICMP misbehaviors, Network Layer: IP Routing protocols and Attacks, Transport Layer: TCP protocol, TCP session hijacking, reset and SYN flooding attacks, DoS and DDoS attacks, DNS protocol, attacks, and DNSSEC, BGP protocol and Attacks.
3. Cryptography basics and applications 12 Hrs
Introduction to Cryptography, Security Threats, Vulnerability, Active and Passive attacks, Security services and mechanism, Conventional Encryption Model, Dimensions of Cryptography, Classical Cryptographic Techniques Block Ciphers (DES, AES), Feistel Cipher Structure, Simplified DES, DES, Double and Triple DES, Block Cipher design Principles, AES, Modes of Operations. Principles Of Public-Key Cryptography, RSA Algorithm, Key Management, Diffie- Hellman Key Exchange, Elgamal Algorithm, Elliptic Curve Cryptography.
4. Security in Networks 10 Hrs
Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flow security, Firewalls – Design and Types of Firewalls, Personal Firewalls, Bypassing firewalls, IDS, Email Security – PGP, S/MIME,
5. Digital Signatures, Blockchains and Bitcoins, Virtual Private Network, Emerging Threats, Responding to Attacks, Case Studies: common mistakes. 6 Hrs

Subject : Network Security lab
Subject Code : CSE612

List of Experiments:

1. W.A.P. to implement Ceaser Cipher
2. W.A.P. to implement Affine Cipher with equation $c=3x+12$
3. W.A.P. to implement Playfair Cipher with key ldrp
4. W.A.P. to implement polyalphabetic Cipher
5. W.A.P. to implement Auto Key Cipher
6. W.A.P. to implement Hill Cipher. (Use any matrix but find the inverse yourself)
7. W.A.P. to implement Rail fence technique
8. W.A.P. to implement Simple Columnar Transposition technique
9. W.A.P. to implement Advanced Columnar Transposition technique
10. W.A.P. to implement Euclidean Algorithm
11. W.A.P. to implement Advanced Euclidean Algorithm
12. W.A.P. to implement Simple RSA Algorithm with small numbers

Reference Books :

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw Hill, 2003
2. William Stallings, "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey.
3. Johannes A. Buchman, "Introduction to Cryptography", 2nd Edition, Springer, 2004
4. Serge Vaudenay, "Classical Introduction to Cryptography – Applications for Communication Security", Springer, 2006
5. Modern Cryptography: Theory and Practice, by Wenbo Mao, Prentice Hall PTR
6. Network Security Essentials: Applications and Standards, by William Stallings. Prentice Hall

Subject : Software Engineering & Tools
Subject Code : CSE605
Total Hours : 42
Full Marks : 80 + 20 = 100

Module I

Overview of System Analysis & Design , Business System Concept, System Development Life Cycle, Waterfall Model , Spiral Model, Feasibility Analysis, Technical Feasibility, Cost- Benefit Analysis, COCOMO model. 10 Hrs

Module II

System Requirement Specification – DFD, Data Dictionary, ER diagram, Process Organization & Interactions. 06 Hrs

System Design – Problem Partitioning, Top-Down And Bottop-Up design ;Decision tree, decision table and structured English; Functional vs. Object- Oriented approach. 06 Hrs

Module III

Coding & Documentation - Structured Programming, OO Programming, Information Hiding, Reuse, System Documentation.

Testing – Levels of Testing, Integration Testing, Test case Specification, Reliability Assessment . , Validation & Verification Metrics, Monitoring & Control. **Usability Testing**

User Interface Testing: What makes a Good UI? , Follows standards or Guidelines, Intuitive, Consistent, Flexible, Comfortable, Correct, Useful. Testing for the Disabled: Accessibility Testing: - It's the Law, accessibility features in software. 06 Hrs

Web site Testing

Web Page Fundamentals, Black-Box Testing: - Text, Hyperlinks, graphics, forms, object and other simple miscellaneous Functionality. Gray Box Testing, Black box testing, White Box Testing, Configuration and compatibility testing, Usability Testing, Introducing Automation

Module IV

Software Project Management – Project Scheduling , Staffing, Software Configuration Management, Quality Assurance, Project Monitoring. 06 Hrs

The Future Software Quality Assurance : Quality is free, testing and quality assurance in the workplace , software testing , Quality Assurance, other names for software testing groups, Test management and organizonal structures, Capability Maturity Model (CMM), ISO 9000 CASE TOOLS : Concepts, use and application. 08 Hrs

Your Careers As a Software Tester: Your job as a software tester, finding software testing position, gaining hands-on experience, Internet links, Professional Organizations.

Subject : Software Engineering & Tools Lab
Subject Code : CSE613

List of Practical's

1. To identify the role of the software in today's world across a few significant Domains related to day to day life.
2. To identify the suitable software development model for the given scenario.
Background "ABC" is a new enterprise recently started by a few young entrepreneurs, intended to develop robotic systems using IT based solutions. "TENZ" is a well-established automobile manufacturing plant, Interested in automating some of the operations of the plant As first step towards automation, TENZ has decided to deploy a robotic arm to pick and place large number of bolts from one tray of a conveyer belt to another tray of a different conveyer belt. Moving one bolt at a time. TENZ has asked ABC for demonstration the robotic arm for the said purpose as a proof of concept. This is the first project being executed by ABC.TENZ would like to have a first experience of the robotic arm before signing the MOU (Memorandum of Understanding) with ABC. After MOU sign-off, TENZ would provide the complete set of requirement of the robot.
Identify the most appropriate SDLC model for this scenario.
3. To identify the various elicitation techniques and their usage for the Banking case study.
4. Suggested domains for Mini-Project:
 - a. Passport automation system.
 - b. Book bank
 - c. Exam Registration
 - d. Stock maintenance system.
 - e. Online course reservation system
 - f. E-ticketing
 - g. Software personnel management system
 - h. Credit card processing
 - i. e-book management system
 - j. Recruitment system
 - k. Foreign trading system
 - l. Conference Management System
 - m. BPO Management System

Books: Text:

1. R. G. Pressman – Software Engineering, TMH
2. Behforooz, Software Engineering Fundamentals, OUP
3. Ghezzi, Software Engineering, PHI
4. Pankaj Jalote – An Integrated Approach to Software Engineering, NAROSA.
5. Object Oriented & Classical Software Engineering(Fifth Edition), SCHACH,TMH
6. Vans Vlet, Software Engineering, SPD
7. Uma, Essentials of Software Engineering, Jaico
8. Sommerville, Ian – Software Engineering, Pearson Education
9. Benmenachen, Software Quality, Vikas

Reference:

1. IEEE Standards on Software Engineering.
2. Kane, Software Defect Prevention, SPD

Subject : Image & Speech Processing (Elective-III)
Subject Code : CSE606
Total Hours : 42
Full Marks : 80 + 20 = 100

Unit-I Introduction to Image Processing 10
hrs

Historical background, visual perception, image formation, Elements of Storage, sampling & Quantization, Relationships between pixels-neighbors of pixel, connectivity labeling of connected components, Relations, equivalence and Transitive closure, Distance measures, Arithmetic/ Logic operation, Imaging Geometry Basic and perspective transformation stereo imaging, application of image Processing.

Unit-II Image Enhancement 10
hrs

Spatial and frequency domain methods point processing, intensity transformation, Histogram processing image subtraction and Averaging spatial filtering, LP, HP and homo-morphic felling, generation of spatial marks, Color image processing.

Unit-III Image Compression 6
hrs

Redundancy models, error free compression, Lossy compression, Image compression standards.

Unit-IV Image Segmentation 6
hrs

Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation, use of motion in segmentation.

Unit-V Speech Processing 10
hrs

Review of human speech and Acoustic theory, nature of sound, harmonics, resonance measurement, virtual display. Music theory, pitch, duration, intervals, rhythm. Human speech production, the vocal tract, the Larynx, the source filter. Speech signal processing-the phasor mode, Fourier transfer, DFT, FFT. The hardware use of FIR & IIR filters. Software, Elements of speech Synthesis speech Recognition-speech in the computer-human interface.

Subject : Image & Speech Processing Lab (Elective-III)
Subject Code : CSE614

List of Experiments

1. Display of gray scale images
2. Histogram Equalisation
3. Design of non linear filter
4. Determination of edge detection using operators
5. 2-D DFT and DCT
6. Filtering in frequency domain
7. Display of colour images
8. Conversion between colour spaces
9. DWT of images
10. Segmentation using watershed transform

Reference Books:

1. Digital Image Processing - by Rafael Gonzalez and Richard E. Woods, Pearson Education Society.
2. Digital Image Processing - by Kenneth R Castleman, Pearson Education Society.
3. A. K. Jain, —Fundamental of Digital Image Processing, PHI
4. Speech and Audio Processing for multimedia PC's - by Iain Murray

Subject : Cloud Computing (Elective-III)
Subject Code : CSE607
Total Hours : 42
Full Marks : 80 + 20 = 100

Module 1: Introduction- Shift from distributed computing to cloud computing; principles and characteristics of cloud computing- IaaS, PaaS, SaaS; service oriented computing and cloud environment 8 Hrs

Module 2: Cloud Computing Technology-Client systems, Networks, server systems and security from services perspectives; Accessing the cloud with platforms and applications; cloud storage 9 Hrs

Module 3: Working with Cloud -Infrastructure as a Service – conceptual model and working Platform as a Service – conceptual model and functionalities. Software as a Service – conceptual model and working. Trends in Service provisioning with clouds 10 Hrs

Module 4: Using Cloud Services-Cloud collaborative applications and services – case studies with calendars, schedulers and event management; cloud applications in project management. 9 Hrs

Module 5: Case studies- Microsoft Azure, Google App Engine and Open source clouds- Open-Nebula and Eucalyptus 6 Hrs

Subject : Cloud Computing Lab (Elective-III)
Subject Code : CSE615

List of Experiments:

1. Create an word document of your class time table and store locally and on cloud with doc and pdf format.
2. Prepare a ppt on cloud on topic of your choice.
3. Create your resume in a neat format using Google and Zoho cloud.
4. Install OpenStack and use it as Infrastructure as a Service and use technology ownCloud.
5. Installing and using identity management feature of OpenStack.
6. Write a program for web feedusing PHP, HTML.
7. Installing and using JOSSO.
8. Installing and using security feature of ownCloud.
9. Installing and using Administrative features of ownCloud.
10. Case study on Amazon EC2.
11. Case study on Microsoft azure.
12. Mini Project :using different features of cloud computing creating owncloud for institute, organization etc.

Text Books:

1. Anthony T.Velte, Toby J.Velte and Robert E, Cloud Computing – A Practical Approach, TMH 2010
2. Michael Miller, Cloud computing – Web based Applications, Pearson Publishing, 2011

Reference Books: 1. Resources from Internet /WWW.

Subject : Unified Modelling Language (Elective-III)
Subject Code : CSE608
Total Hours : 42
Full Marks : 80 + 20 = 100

Content:

1. Introduction of UML: Overview, Conceptual Model of UML, Software Architecture, Software Development Life Cycle, Classes, Relationships, Common Mechanisms of UML. The importance of modelling, principles of modelling. 04 Hrs
2. Class Diagrams: Terms and Concepts, Common Modelling Techniques, Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages 08 Hrs
3. Instances, Object Diagrams, Basic Behavioural Modelling: Interactions, Use cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams. 08 Hrs
4. Advanced Behavioural Modelling: Events and Signals, State Machines, State Diagrams, Architectural Modelling: Components, Collaborations, Component Diagrams, Deployment Diagrams. 08 Hrs
5. Generate Use-case Diagram, Class Diagram, Sequence Diagram, Collaboration Diagram, Activity Diagram, State Chart Diagram, Component Diagram, Deployment Diagram for the following systems. 14 Hrs
 - Student Registration System
 - Courier Tracking System
 - Online Shopping System
 - Online Pizza ordering System
 - Online Job Portal System

Subject : Unified Modelling Language Lab (Elective-III)
Subject Code : CSE616

List of Experiments:

1. Identify the elements and relationship by analysing the class diagram of Easy Shop Retail Application case study.
2. To draw different UML diagrams using Rational rose software .
3. To draw different UML diagrams using Microsoft Visio software.

Text Books :

1. Ali Bahrami, - "Object –Oriented System Development" - Mc Graw Hill.
2. Rambaugh, James Michael, Blaha - "Object Oriented Modelling and Design" - Prentice Hall India/ Pearson Education

Subject : Animation & Multimedia (Elective-IV)
Subject Code : CSE609
Total Hours : 42
Full Marks : 80 + 20 = 100

1. Multimedia Elements Multimedia Application **8 hrs**

1.1 I/P, O/P devices

Limitations of Traditional Input Device, Digital v/s Analog, Input- Pen-Input, Image Scanner, Charge Coupled Devices, MIDI, Digital Camera, Output, Display System Technology, CRT display System, Display Terminology, Flat Panel Display, Print o/p technology, Dye Sublimation

1.2 Evaluation of Multimedia systems

Multimedia Elements (Fasimile, Document image, photographs image, Geographics information system maps, Fullmotion and live video, Holographics images Fractcals). Multimedia Application(Document imaging,Image processing and Image Enhancement, OCR, Handwriting recognition, Non textual Image recognition, Full motion Digital Video application and Electronics messaging). Multimedia System Architecture, Evolving Tech.for Multimedia, Defining Objects for Multimedia Systems, Multimedia Data Interface Standard

1.3 Storage media

Magnetic Media Technology, Hard disk Technology, RAID, Criteria for Selection of RAID, Use of Magnetic Storage in Multimedia, Optical Media, Magneto Optical

2. Architecture & Issues For Distributed Multimedia System. **6 hrs**

2.1 Multimedia System Architecture.

2.2 Distributed Multimedia.

2.3 Synchronization, Orchestration & QOS Architecture

2.4 Framework for Multimedia System

3. Compression/Decompression & File Formats **10 hrs**

3.1 Need, Types, Evaluating & Visibility

Evaluating the Compression System, How much, Compression, How Good is Picture, How fast Does it Compress or Decompress, What H/W & S/W Does it take, Redundancy & Usability

3.2 Compression and Decompression

Types of compression, Need of Data Compression, Color Gray Scale and Still Video Image, Color Characteristics, Color Model

3.3 Video Compression Technique

Simple Compression Technique, Interpolative, Predictive, Transfer Coding, Discrete Transfer, Statistical (Huffman, arithmetic)JPEG Compression, Requirement Addressing JPEG, Definition of JPEG Standard, Overview of JPEG Components, JPEG methodology, The discrete cosine Transfer , Quantization, Zigzag Sequence, Encoding

Introduction to Standardization of Algorithm

File Formats

History of RIF, TIFF

TIFF Specification , TIFF structure , TIFF tag ,TIFF Implementation issues , TIFF classes

RIFF Chunks with two sub chunks , List chunk , RIFF

waveform Audio File format , RIFF MIDI file

Format, RIFF DIB's,

Introduction to RIFF, AVI

RIFF AVI File format, Index Chunk and Boundary condition handling for AVI files., AVI Indeo File Format

JPEG-objectives, Architecture, JPEG-DCT encoding

Quantization.

JPEG-stastical coding, predictive lossless coding, JPEG

performance

MPEG-objectives, Architecture, BIT stream syntax performance

MPEG2 & MPEG4

4. Multimedia Authoring and User Interface

6 hrs

4.1 Multi Media Authoring System and its type

4.2 Hypermedia Application Design consideration

4.3 User Interface Design

4.4 Information Access

4.5 Object Display / Playback Issues

5. Distributed Multimedia Systems

6 hrs

5.1 Components of Distributed Multimedia Systems

5.2 Distributed Client Server Operation

5.3 Multimedia Object Server

5.4 Multi Server Network topologies

5.5. Distributed Multimedia Databases

6. Multimedia Tool

6 hrs

6.1 Introduction to Multimedia tool – Flash

6.2 Creating & Modifying elements

6.3 Line tool, fill/attributes, different shapes, text tools & pen tool

6.4 Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects

Subject : Animation & Multimedia Lab (Elective-IV)

Subject Code : CSE617

List of Experiments:

1. Create a cycle & name each part of cycle using different styles & format & animate text.
2. Draw seed & create small plant with use of at least 4 frames.
3. Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
4. Create a forest of trees using the object created earlier. Also add lighting and rain effect.
5. Insert audio to relevant frames that has lighting & rain effect.
6. Convert created work into file format which can be publish on web.
7. Interfacing digital-web-cam, capturing live image & editing using web-cam software.
8. Importing & exporting images, apply different image editing tools.
9. Mini Project: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D-MAX or MAYA software.

Learning Resources: Books:

Sr. No.	Author	Title	Publication
01	Prabhat k. Andheigh, Kiran Thakrar, John F	Multimedia Systems Design	Prentice Hall of India
02	Koegel Buford	Multimedia Systems	Pearson Education
03	Katherine Ulrich	Micromedia Flash for Windows and Macintosh	Pearson Education
04	Free Halshall	Multimedia Communication	Pearson Education
05	R. Steimnetz, K. Nahrstedt	Multimedia Computing, Communication and Application	Pearson Education
06	J.D. Gibson	Multimedia Communication Directions and Innovations	Academic Press, Hardcourt India
07	J.F. Kurose, K. W. Rose	Computer Networking	Pearson Education

Subject : Internet of Things (Elective-IV)
Subject Code : CSE611
Total Hours : 42
Full Marks : 80 + 20 = 100

Concept of working of Internet	2 hrs
Sensors and actuators introduction	4 hrs
Networking of devices and systems and concept of multimedia	4 hrs
Introduction to IOT and low interoperability for the IPv6	4 hrs
A review of IOT working across	2 hrs
RFID technology introduction and mapping and localization of RFID technology	4 hrs
Concept of wave	2hrs
Performance comparison of multi hop wireless Ad Hoc network routing protocols	4 hrs
Power assignment method for Multi Sink WSN with and without outage probability constraints	2 hrs
Routing in Vehicular Ad Hoc networks	2 hrs
LTE and IEEE802 protocol for vehicular networking	2 hrs
Investigation and optimization of IEEE 802 for industrial wireless networks	2 hrs
Performance analysis for slotted SCMA / CA in IEEE 802	2 hrs
Integration of wireless sensor network to IOT using different gateways	2 hrs
Communication Industrial wireless mesh network	2 hrs
Networks primitives in wireless sensor networks	2 hrs
Applications of IOT	2 hrs

Subject : Internet of Things Lab (Elective-IV)
Subject Code : CSE619

List of Experiments -

1. Physical and virtual Networking
2. Multimedia operation using wireless modes
3. Development of systems based on IOT technique
4. Operation of sensors through networking in wired and wireless modes
5. Operation of actuators through networking in wired and wireless modes
6. Smart board handling through wireless networks
7. GSM based evaluation of road traffic system
8. Smart town features demonstration
9. Cloud based operation
10. Case study of IOT based system.

Books

IoT Inc, Bruce Sinclair

Building the Internet of Things by M Kranze

Race Against the Machine by Erik Brynjolfsson and Andrew McAfee

Internet of Things: Principles and Paradigms by Rajkumar Buyya (Editor), Amir Vahid Dastjerdi (Editor)

Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the Cloud by Cuno Pfister (Author)

Enterprise IoT: Strategies & Best Practices for Connected Products & Services by by Dirk Slama (Author), Frank Puhlmann (Author), Jim Morrish (Author), Rishi M Bhatnagar (Author)

The Ultimate Introduction to IoT by leverage

Subject : **Script Programming**
Subject Code : **CSE**
Total Hours : **42**
Full Marks : **80 + 20 = 100**

Module1: Introduction to Script programming in Linux and MS-Windows Perl programming	10 Hrs
Module2: Python programming	8 Hrs
Module3: Php programming	8 Hrs
Module4: Windows Power shell programming	8 Hrs
Module5: Applications development with Client/server architecture, graphs, GUI and graphics programming using script languages searching and search engine development using script languages.	8 Hrs

List of Experiments

Students are to undertake minimum 4 programs each in Python , php and Window shell programming.

Text Books:

1. Programming Perl, 3rd Edition By Larry Wall, Tom Christiansen, Jon Orwant O'Reilly 2000
2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2008, ISBN 1-59059-982-9
3. PhP 5 Power programming available at:
http://ptgmedia.pearsoncmg.com/images/013147149X/downloads/013147149X_book.pdf
4. Professional Windows Power Shell Programming ISBN: 978-0-470-17393-0 Wrox book Professional

Subject : Professional Practices (Common Paper)
Subject Code : 602

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Activities to be undertaken:

Students are expected to undertake these activities:

1. Acquire information from different sources (Print and electronic) on the topics of specialization and related to the subjects of II and final year. The class is to be divided in groups of not more than five to six students in a group and all groups are to be allotted topic of their choice. The topic should not be repeated to other group for originality of work to be performed by the group. This activity will develop interdependence and leadership among the students.
2. Prepare notes for given topic at point no 1. The notes will be in form of a project report, having all the sections of report. The report should not be of 30 – 50 pages.
3. Prepare presentation and Present the learning and finding on given topic in a seminar. The presentation should be prepared in Power Point module having more than 25 slides. All students should be asked to deal with suitable parts decided by the group itself.
4. Interact with peers to share thoughts. After the final presentation the students should be encouraged to interact with the faculty members, students' fellows and other experts for suggestions and advanced and structured learning.
5. Undertake industrial visit of their area and choice. Prepare a report on industrial visit. Expert lectures on the topic selected may be invited for the students and these expert lectures also the students should be asked to prepare a report and present the same in seminar or have a group discussion before the expert and faculty members.
6. Develop entrepreneurial traits. Students group may be asked to have a field survey and product assessment and analysis for a product of their choice. Prepare a report for all the inputs of their requirement and submit it for evaluation.
7. To prepare for start ups. Expert lectures for exploring this option may be arranged as this is also a viable option and much talked about option for self employment and avail the encouragement by the government.

Based on the above rationales students will advised to develop traits under guidance of dedicated faculty members / mentors.