PROGRAM STRUCTURE
AND
DETAILED SYLLABUS (Volume-II)

COMPUTER SCIENCE AND ENGINEERING

FOR
CBCS BASED B.TECH – FOUR YEAR DEGREE PROGRAM
(Applicable for the batches admitted from AY 2016-17)

GEETHANJALI COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)
Cheeryal (V), Keesara (M), Medchal Dist., Pin Code: 501 301
# B.Tech. COMPUTER SCIENCE AND ENGINEERING

## PROGRAM STRUCTURE

### FIRST YEAR SEMESTER-I

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Total Periods Per Week: 30

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Total Periods Per Week 31
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Total Periods Per Week 31
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Department of Computer Science and Engineering  
(Accredited by NBA)
### THIRD YEAR SEMESTER-I

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**Total Periods Per Week:** 27
# FOURTH YEAR SEMESTER-I

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Total Periods Per Week: **28**
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Total Periods Per Week: 27
16CS4101 – COMPILER DESIGN

IV Year. B.Tech. (CSE) – I Sem

Prerequisite(s): Formal Languages and Automata Theory

Course Objectives

Develop ability to

1. Understand and list the different stages in the process of compilation.
2. Identify different methods of lexical analysis
3. Design top-down and bottom-up parsers
4. Identify synthesized and inherited attributes
5. Develop syntax directed translation schemes
6. Develop algorithms to generate code for a target machine

Course Outcomes (COs)

After successful completion of this course, student would be able to

CO1. Describe different stages in the process of compilation, different methods of lexical analysis and synthesized and inherited attributes
CO2. Develop lexical analyser for a given grammar specification
CO3. Design top-down and bottom-up parsers for a given parser specification
CO4. Develop syntax directed translation schemes
CO5. Develop algorithms to generate code for a target machine

UNIT–I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Pre-processing steps required for predictive parsing.

UNIT–II

Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT–III

Semantic analysis: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.
UNIT–IV
**Code optimization:** Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT–V
**Object code generation:** Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

**TEXT BOOKS**

**REFERENCE BOOKS**
1. Lex & yacc – John R. Levine, Tony Mason, Doug Brown, O’reilly
3. Engineering a Compiler, Cooper & Linda, Elsevier.
16CS4102 – COMPUTER NETWORKS
IV Year. B.Tech. (CSE) – I Sem

Prerequisites: Operating Systems

Course Objectives
Develop ability to
1. To develop an understanding of modern network architectures from a design and performance perspective.
2. To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
3. To provide an opportunity to do network programming
4. To provide a WLAN measurement ideas.

Course Outcomes (COs)
After completion of the course, student would be able to

CO1. Explain the functions of the different layers of the OSI Protocol.
CO2. Draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) and describe the functions of each block.
CO3. Design a wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) for a given requirement (small scale) based on the market available components
CO4. Develop a program for a given problem related to TCP/IP protocol using network programming.
CO5. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

UNIT- I

UNIT- II
Data Link Layer and Medium Access Sub Layer: Error Detection and Error Correction - Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error control protocols - Stop and Wait, Go back – N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, Multiple access protocols -Pure ALOHA, Slotted ALOHA, CSMA/CD,CDMA/CA

UNIT- III
Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols.
UNIT- IV

UNIT- V
Application Layer: Domain Name Space (DNS), DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts of Cryptography

TEXT BOOKS

REFERENCE BOOKS
3. TCP/IP Illustrated, Volume 1, W. Richard Stevens, Addison Wesley, United States of America.
16CS4103 – MOBILE APPLICATION DEVELOPMENT
IV Year. B.Tech. CSE – I SEM

Prerequisite(s):
OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Objectives
Develop ability to
1. Understand the architecture of mobile software applications and mobile development frameworks and tools.
2. Use XML and UML for mobile computing
3. Understand various technologies related to generic user interface development, mobile GUIs, VUIs and their applications
4. Explain the process of modelling multichannel and multimodal user interfaces using UML
5. Understand mobile application development hurdles with proper selection of architecture, design and technology in mobile application development process.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe the architecture of mobile software applications and mobile development frameworks and tools.
CO2. Use XML and UML for mobile computing
CO3. Identify various technologies related to generic user interface development, mobile GUIs, VUIs and their applications
CO4. State the process of modelling multichannel and multimodal user interfaces using UML
CO5. Identify and overcome mobile application development hurdles with proper selection of architecture, design and technology in mobile application development process.

UNIT-I
Introduction: Mobile computing-Introduction, added dimension of mobile computing, condition of the mobile user, architecture of mobile software applications.


UNIT-II:
XML: Introduction, XML web services, key XML technologies for mobile computing, XML and UML, putting XML to work.

UML: Introduction, user view, structural view, behavioural view, implementation view: component diagrams,
UNIT-III
Generic User Interface Development: Introduction, user interface development, building generic user interfaces, using UML for modelling generic user interface components, XForms, putting it all to work.

Developing Mobile GUIs: Introduction, WAP, J2ME, BREW and Microsoft platforms for mobile GUIs.

UNIT-IV
VUIs and Mobile Applications: Introduction, qualities of speech, voice transcription, voice recognition, text-to-speech technologies: converting written language to spoken language.

Multichannel and Multimodal User Interfaces: Introduction, modelling multichannel and multimodal applications with UML, multimodal content, software and system architectures for delivering multimodality, internationalization and localization, the evolving definition of multimodality.

UNIT-V
The Mobile Development Process: Introduction, back to the dimensions of mobility, applying the wisdom methodology to mobile development, UML-based development cycle for mobile applications.

Architecture, Design and Technology Selection for Mobile Applications: Introduction, practical concerns with architectures, architectural patterns for mobile applications.

Mobile Application Development Hurdles: Introduction, voice user interface hurdles, hurdles with multimodal applications, problems with building location based applications, power use.

TEXT BOOK

REFERENCE BOOKS
16CS4104 – CLOUD COMPUTING
IV Year. B.Tech. CSE – I SEM

Prerequisite(s): Operating Systems

Course Objectives
Develop ability to
1. Understand different computing models.
2. Introduce various types of virtualizations and hypervisors
3. Use and adopt Cloud Computing services and tools in their real life scenarios.
4. Explore some important cloud computing driven commercial systems such as Amazon Web Services, Google cloud services, Microsoft Azure etc.
5. Describe the security aspects in cloud

Course Outcomes (COs)
Upon successful completion of this course, students will be able to
CO1. Distinguish different types of Distributed Computing models and Identify different cloud computing models and services provided by cloud providers
CO2. Illustrate Cloud Applications and Paradigms
CO3. Demonstrate virtualization of clusters and data centers
CO4. Apply and design Cloud Resource Management and scheduling algorithms
CO5. Explain Storage models and security aspects of Cloud

Unit-I


Unit-II

Unit-III


Unit-IV


Application Development: Amazon Web Services: EC2 Instances, Connecting Clients to Cloud Instances Through Firewalls, Security Rules for Application and Transport Layer Protocols in EC2, How to Launch an EC2 Linux Instance and Connect to it, How to Use S3 in Java, How to Install the Simple Notification Service on Ubuntu.

Unit-V


TEXT BOOK

REFERENCE BOOKS
3. Distributed and Cloud Computing: From parallel processing to the Internet of Things, Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra
16CS4105 – ADVANCED COMPUTER ARCHITECTURE (PROFESSIONAL ELECTIVE-II)

IV Year. B.Tech. CSE – I Sem

Prerequisite(s):
COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING

Course Objectives
Develop the ability to
1. Understand scalable performance of various parallel computer models in terms of program and network properties and performance metrics and measures.
2. Understand the importance of hardware technologies involved in parallelism, such as, processors, bus, cache memory, shared memory along with techniques, such as, pipelining and superscalar techniques.
3. Understand various parallel and scalable architectures, like, multiprocessors, multicomputers, multivector and SIMD computers etc..
4. Understand various softwares for parallel programming, like, languages, compilers and parallel program development and environments.
5. Understand instruction level and system level parallelisms and describe trends in parallel systems

Course Outcomes (COs)
At the end of the course, the student should be able to:
CO1. Describe the scalable performance of various parallel computer models in terms of program and network properties and performance metrics and measures.
CO2. Highlight the importance of hardware technologies involved in parallelism, such as, processors, bus, cache memory, shared memory along with techniques, such as, pipelining and superscalar techniques.
CO3. Differentiate various parallel and scalable architectures, like, multiprocessors, multicomputers, multivector and SIMD computers etc..
CO4. Identify various softwares for parallel programming, like, languages, compilers and parallel program development and environments.
CO5. Differentiate instruction level and system level parallelisms and describe trends in parallel systems

UNIT-I: Theory of Parallelism

**Principles of Scalable Performance**: Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Laws, Scalability Analysis and Approaches.

**UNIT-II: Hardware Technologies**

**Processors and Memory Hierarchy**: Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

**Bus, Cache, and Shared Memory**: Bus Systems, Cache Memory Organizations, Shared Memory Organizations, Sequential and Weak Consistency Models.

**Pipelining and Superscalar Techniques**: Linear Pipeline Processors, Nonlinear Pipeline Processors, Instruction Pipeline Design, Arithmetic Pipeline Design, Superscalar Pipeline Design.

**UNIT-III: Parallel and Scalable Architectures**

**Multiprocessors and Multicomputers**: Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Three Generations of Multicomputers, Message-Passing Mechanisms.


**Scalable, Multithreaded, and Dataflow Architectures**: Latency-Hiding Techniques, Principles of Multithreading, Fine-Grain Multicomputers, Scalable and Multithreaded Architectures, Dataflow and Hybrid Architectures.

**UNIT-IV: Software for Parallel Programming**

**Parallel Models, Languages, and Compilers**: Parallel Programming Models, Parallel Languages and Compilers, Dependence Analysis of Data Arrays, Code Optimization and Scheduling, Loop Parallelization and Pipelining.

**Parallel Program Development and Environments**: Parallel Programming Environments, Synchronization and Multiprocessing Modes, Shared Variable Program Structures, Message-Passing Program Development, Mapping Programs onto Multicomputers.

**UNIT-V: Instruction and System Level Parallelism**

**Instruction Level Parallelism**: Computer Architecture, Basic Design Issues, Problem Definition, Model of a Typical Processor, Compiler-detected Instruction Level Parallelism, Operand Forwarding, Reorder Buffer, Register Renaming, Tomasulo’s Algorithm, Branch Prediction, Limitations in Exploiting Instruction Level Parallelism, Thread Level Parallelism.

**Trends in Parallel Systems**: Brief Overview of Technology, Forms of Parallelism, Case Studies, Parallel Programming Models and Languages.
TEXT BOOK

REFERENCE BOOKS
16CS4106-REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS
(PROFESSIONAL ELECTIVE-II)

IV Year.B.Tech. CSE –I Sem

Prerequisites: None

Course Objectives
Develop ability to
1. Understand basic principles of remote sensing
2. Understand various remote sensing platforms and sensors in general and visual image interpretation in particular.
3. Understand fundamentals of GIS like, roots, definitions, terminology, architecture and theoretical framework.
4. Understand various issues related to data quality, data analysis and data modelling
5. Understand the integration of remote sensing and GIS

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe the basic principles of remote sensing
CO2. Explain about various remote sensing platforms and sensors in general and visual image interpretation in particular.
CO3. Describe fundamentals of GIS like, roots, definitions, terminology, architecture and theoretical framework.
CO4. Articulate various issues related to data quality, data analysis and data modelling
CO5. Perform integration of remote sensing and GIS

UNIT-I

UNIT-II

Visual Image Interpretation: Introduction, Types of Pictorial Data Products, Image interpretation strategy, Process of Image Interpretation, Interpretation of Aerial Photo, General Procedure for photo interpretation, Three dimensional interpretation method, Basic elements of image interpretation, Interpretation of satellite imagery, key elements of visual image interpretation, Concept of converging evidence.

UNIT-III
Fundamentals of GIS: Introduction, Roots of GIS, Overview of information system, The four Ms, Contribution disciplines, GIS definitions and terminology, GIS Queries, GIS architecture,
Theoretical Models of GIS, Theoretical framework of GIS, GIS categories, Levels/ Scales of measurement.

**Spatial data modelling:** Introduction, Stages of GIS data modelling, graphic representation of spatial data, raster GIS models, vector GIS models, Comparison of raster and vector models.

**UNIT-IV**
**Data quality issues:** Introduction, components of data quality, accuracy, precision and resolution, consistency, completeness, sources of error in GIS, modelling errors, error evaluation by graphical methods.

**Data analysis and modelling:** Introduction, format conversion, data medium conversion, spatial measurement methods, reclassification, buffering techniques, overlay analysis, modelling surfaces, modelling networks, GIS output.

**UNIT-V**
**Integration of remote sensing and GIS:** Introduction, remote sensing and GIS synergy, raster data for GIS, vector data for GIS, need for integration, facilities for integration, general view on applications, software scenario.

**TEXT BOOKS**
1. Remote Sensing and Image Interpretation Lillesand and Kiefer John Wiley and Sons, 2017

**REFERENCE BOOKS**
3. Fundamentals of GIS Micheal N Demers JohnWiley & Sons
16CS4107 – DISTRIBUTED SYSTEMS
(PROFESSIONAL ELECTIVE-II)

IV Year. B.Tech. CSE – I SEM

Course Objectives
Develop ability to
1. Understand what and why a distributed system is
2. Understand Theoretical concepts namely virtual time, agreement and consensus protocols.
3. Understand IPC, group communication and RPC concepts
4. Understand the DFS and DSM concepts
5. Understand the concepts of transaction in distributed environment and associated concepts namely, concurrency control, deadlocks and error recovery.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe the advantages and disadvantages of distributed system models using the characteristics of the distributed system and the desired features.
CO2. Highlight the importance of time & global states and coordination & agreement.
CO3. Describe various aspects of inter process communication, distributed objects and remote invocation in distributed systems.
CO4. Study distributed file systems (Sun Network File System, The Andrew File System), Name services (The global name services), distributed shared memory (Sequential consistency and IVY, Munin) and distributed multimedia (Amoeba, Mach, Chorus).
CO5. Explain transactions and concurrency control in distributed systems.

UNIT-I


UNIT-II
Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging.

Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT-III
Inter Process Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.
Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

Distributed Shared Memory: Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency, Munin Case Study, Other Consistency Models.

Distributed Multimedia: Characteristics of multimedia Data, Quality of Service Managements, Case Study of Distributed System: Amoeba, Mach, Chorus.

UNIT- V
Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control.

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

TEXT BOOK

REFERENCE BOOKS
16CS4108-SOFT COMPUTING
(PROFESSIONAL ELECTIVE-II)

IV Year. B.Tech. CSE –I Sem

Prerequisite(s): None

Course Objectives
Develop ability to
1. Explain AI problems and search techniques
2. Understand the supervised and unsupervised learning networks
3. Elaborate classical sets and fuzzy sets
4. Understand fuzzy decision making
5. Understand and design genetic algorithms.

Course Outcomes (COs)
Upon successful completion of this course, students will be able to
CO1. Apply search techniques to solve AI problems.
CO2. Describe various supervised learning networks
CO3. Comprehend the differences between classical sets and fuzzy sets.
CO4. Perform fuzzy decision making
CO5. Describe solutions using genetic algorithms for real time problems.

UNIT-I
AI Problems and Search: AI problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques- Generate and Test, Hill Climbing, Best First Search Problem reduction, Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation- Using Predicate Logic and Rules.

UNIT-II
Supervised Learning Networks-perceptron, Back propagation algorithm-Classification Problem-Speech Processing Case study. Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization,

UNIT-III

UNIT-IV
UNIT-V

TEXT BOOK

REFERENCE BOOKS
5. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group
16CS4109 – BIG DATA ANALYTICS
(PROFESSIONAL ELECTIVE - III)

IV Year B. Tech. CSE-I Sem

Prerequisites: None

Course Objectives
Develop ability to
1. Understand the features of R and the process of importing and exporting data from various databases in R
2. Understand the features and modes of Hadoop along with HDFS and MapReduce architectures.
3. Explain RHIPE, RHadoop and Hadoop Streaming with R.
4. Understand all the steps of data analytics project life cycle and application to various data analytics projects.
5. Perform various supervised and unsupervised machine learning algorithms for big data analysis.

Course Outcomes (COs)
After successful completion of the course, student would be able to
CO1. Describe the features of R and the process of importing and exporting data from various databases in R
CO2. Identify the features and modes of Hadoop along with HDFS and MapReduce architectures.
CO3. Describe and use RHIPE, RHadoop and Hadoop Streaming with R.
CO4. Identify and perform all the steps of data analytics project life cycle on various data analytics projects.
CO5. Perform various supervised and unsupervised machine learning algorithms for big data analysis.

UNIT-I: Getting Ready to use R and Hadoop: Features of R language, importing and exporting data from various databases, different Hadoop modes, Hadoop features, HDFS, HDFS and MapReduce architecture.
Hadoop MapReduce, fundamentals, writing a Hadoop MapReduce example, Hadoop MapReduce in R.


UNIT-III: Data Analytics with R and Hadoop: Data analytics project life cycle-identifying the problem, designing data requirement, preprocessing data, performing analytics over data, visualizing data.
UNIT-IV: Data Analytics Problems - exploring web page categorization, computing the frequency of stock market change, predicting the sale price of blue book for bulldozers (case study)


TEXT BOOK

REFERENCE BOOKS
3. Business Analytics 5e , BY Albright Winston
5. Business Intelligence Roadmap, Lariss T. Moss, ShakuAtre, Addison-Wesley It Service.
16CS4110 – SOFTWARE PRACTICE AND TESTING
(PROFESSIONAL ELECTIVE - III)

IV Year B. Tech. CSE-I Sem

Prerequisites: None

Course Objectives
Develop ability to

1. Understand the behavior of the testing techniques to detect the errors in the software
2. Understand standard principles and to check the occurrence of defects and its removal.
3. Understand the functionality of automated testing tools
4. Understand the various models of software reliability.
5. Understand the estimation of cost and schedule based on standard metrics.

Course Outcomes (COs)
After completion of the course, student would be able to

CO1. Test the software by applying testing techniques to deliver a product free from bugs and evaluate the web applications using bug tracking tools
CO2. Investigate the scenario and the able to select the proper testing technique
CO3. Explore the test automation concepts and tools
CO4. Deliver quality product to the clients by way of applying standards such as TQM, Six Sigma.
CO5. Evaluate the estimation of cost, schedule based on standard metrics.

UNIT I TESTING ENVIRONMENT AND TEST PROCESSES

UNIT II TESTING TECHNIQUES AND LEVELS OF TESTING

UNIT III INCORPORATING SPECIALIZED TESTING RESPONSIBILITIES
UNIT IV TEST AUTOMATION

UNIT V SOFTWARE TESTING AND QUALITY METRICS

TEXT BOOK(S)

REFERENCE BOOK(S)
IV Year B. Tech. CSE-I Sem

Pre-requisites: None

Course Objectives
Develop ability to
1. Understand various aspects of PRAM model
2. Understand sorting networks
3. Understand networking: topologies, interconnection
4. Understand various algorithms on a ring of processors.
5. Understand various algorithms on grids of processors.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe various aspects of PRAM model
CO2. Explain sorting networks
CO3. Discuss networking: topologies, interconnection
CO4. Comprehend various algorithms on a ring of processors.
CO5. Comprehend various algorithms on grids of processors.

UNIT-I

UNIT-II
Sorting Networks, Odd-Even Merge Sort, Odd-Even Merging Network, Sorting Network,0–1 Principle, Sorting on a One-Dimensional Network, Odd-even Transposition Sort, Odd-even Sorting on a One-Dimensional Network.

UNIT-III

UNIT-IV
Algorithms on a Ring of Processors, matrix-Vector Multiplication, Matrix-Matrix Multiplication, First Look at Stencil Applications, A Simple Sequential Stencil Algorithm,
Parallelizations of the Stencil Algorithm, LU Factorization, Pipelining on the Ring, Look-Ahead Algorithm, Parallelization on a Unidirectional Ring, Parallelization on a Bidirectional Ring, implementing Logical Topologies, distributed vs. Centralized Implementations.

UNIT-V

TEXT BOOK(S)
16CS4112 – WEB SERVICES  
(PROFESSIONAL ELECTIVE - III) 

IV Year B. Tech. CSE-I Sem

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Prerequisites: None

Course Objectives
Develop ability to
1. Understand evolution, emergence, introduction and architecture of web services.
2. Understand core fundamentals of SOAP and development of web services using SOAP
3. Understand WSDL
4. Understand web service discovery
5. Understand the interoperability of web services

Course Outcomes
At the end of this course, student would be able to

CO1. Describe evolution, emergence, introduction and architecture of web services.
CO2. Describe core fundamentals of SOAP and develop web services using SOAP
CO3. Use WSDL
CO4. Explain web service discovery
CO5. Articulate the interoperability of web services

UNIT - I
Evolution and Emergence of Web Services - Evolution of distributed computing. Core distributed computing technologies -client/server, CORBA, JAVA RMI, MicroSoft DCOM, MOM, Challenges in Distributed Computing. Role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

Introduction to Web Services - The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

Web Services Architecture - Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services, developing web services enabled applications

UNIT-II
Core fundamentals of SOAP - SOAP Message Structure, SOAP encoding, SOAP message exchange models, SOAP communication and messaging, SOAP security.

Developing Web Services using SOAP - Building SOAP Web Services, developing SOAP Web Services using Java, limitations of SOAP.
UNIT- III
Describing Web Services - WSDL - WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

UNIT- IV
Discovering Web Services - Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI - UDDI Registries, uses of UDDI Registry, Programming with UDDI. UDDI data structures, support for categorization in UDDI Registries, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, deleting information in a UDDI Registry, limitations of UDDI.

UNIT- V

TEXT BOOK(S)
1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India, rp-2016..

REFERENCE BOOK(S)
2. Java Web Services, D. A. Chappell & T. Jewell, O'Reilly,SPD.
Mobile Application Development Lab

Course Objectives
Develop ability to
1. Understand the architecture of mobile software applications and mobile development frameworks and tools.
2. Use XML and UML for mobile computing
3. Understand various technologies related to generic user interface development, mobile GUIs, VUIs and their applications
4. Explain the process of modelling multichannel and multimodal user interfaces using UML
5. Understand mobile application development hurdles with proper selection of architecture, design and technology in mobile application development process.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe the architecture of mobile software applications and mobile development frameworks and tools.
CO2. Use XML and UML for mobile computing
CO3. Identify various technologies related to generic user interface development, mobile GUIs, VUIs and their applications
CO4. State the process of modelling multichannel and multimodal user interfaces using UML
CO5. Identify and overcome mobile application development hurdles with proper selection of architecture, design and technology in mobile application development process.

List of exercises
1. Create an android application to display a message on the screen.
2. Create android applications using following layouts
   a. Linear layout
   b. Absolute layout
   c. Table layout
   d. Relative layout
   e. Frame layout
3. Create android applications using following views
   a. Basic views
   b. Picker views
   c. List views
   d. Image views
4. Send an SMS message in android programmatically
5. Display a locations marker on a map in android programmatically
6. Design a mobile web application with all HTML5 form elements.
7. Write a mobile web application to demonstrate HTML5 offline storage

**Compiler Design Lab**

**Course Objectives**
Develop ability to
1. Understand and list the different stages in the process of compilation.
2. Identify different methods of lexical analysis
3. Design top-down and bottom-up parsers
4. Identify synthesized and inherited attributes
5. Develop syntax directed translation schemes
6. Develop algorithms to generate code for a target machine

**Course Outcomes (COs)**
After successful completion of this course, student would be able to
CO1. Describe different stages in the process of compilation, different methods of lexical analysis and synthesized and inherited attributes
CO2. Develop lexical analyser for a given grammar specification
CO3. Design top-down and bottom-up parsers for a given parser specification
CO4. Develop syntax directed translation schemes
CO5. Develop algorithms to generate code for a target machine

**List of exercises**
1. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value. Simulate the same in C language.
2. Write a C program to identify whether a given line is a comment or not.
3. Write a C program to recognize strings under 'a', 'a*b+', 'abb'.
4. Write a C program to test whether a given identifier is valid or not.
5. Write a C program to simulate lexical analyzer for validating operators.
6. Implement the lexical analyzer using JLex, flex or other lexical analyzer generating tools.
7. Write a C program for implementing the functionalities of predictive parser for the mini language specified in Note 1.
8. a) Write a C program for constructing of LL (1) parsing.
   b) Write a C program for constructing recursive descent parsing.
9. Write a C program to implement LALR parsing.
10. a) Write a C program to implement operator precedence parsing.
    b) Write a C program to implement Program semantic rules to calculate the expression that takes an expression with digits, + and * and computes the value.
11. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree for the mini language specified in Note 1.
12. Write a C program to generate machine code from abstract syntax tree generated by the parser. The instruction set specified in Note 2 may be considered as the target code.
16CS41L2– COMPUTER NETWORKS AND CLOUD COMPUTING LAB
IV Year B. Tech. CSE-I Sem

Prerequisites: None

Computer Networks Lab:

Course Objectives
Develop ability to
1. To develop an understanding of modern network architectures from a design and performance perspective.
2. To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
3. To provide an opportunity to do network programming
4. To provide a WLAN measurement ideas.

Course Outcomes
After completion of the course, student would be able to
CO1. Explain the functions of the different layers of the OSI Protocol.
CO2. Draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) and describe the functions of each block.
CO3. Design a wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) for a given requirement (small scale) based on the market available components
CO4. Develop a program for a given problem related to TCP/IP protocol using network programming.
CO5. Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.

List of exercises
1. Study of different types of Network cables and practically implement the cross-wired cable and straight through cable using clamping tool.
2. Study of Network devices, IP in details.
3. Connect the computers in LAN, Study of basic network command and network configuration commands
4. Configure a network topology using packet tracer software.
5. Configure a network using Distance Vector Routing protocol and Link State routing protocol.
Cloud Computing Lab:

Course Objectives
Develop ability to
1. Understand different computing models.
2. Introduce various types of virtualizations and hypervisors
3. Use and adopt Cloud Computing services and tools in their real life scenarios.
4. Explore some important cloud computing driven commercial systems such as Amazon Web Services, Google cloud services, Microsoft Azure etc.
5. Describe the security aspects in cloud

Course Outcomes (COs)
Upon successful completion of this course, students will be able to
CO1. Distinguish different types of Distributed Computing models and Identify different cloud computing models and services provided by cloud providers
CO2. Illustrate Cloud Applications and Paradigms
CO3. Demonstrate virtualization of clusters and data centers
CO4. Apply and design Cloud Resource Management and scheduling algorithms
CO5. Explain Storage models and security aspects of Cloud

List of exercises
1. Create Virtual machines using Open source software : VM Ware/ Oracle Virtual Box
2. Use Amazon EC2 to create a virtual machine
3. Use Amazon S3 in Java
4. Install the Simple Notification Service on Ubuntu
5. Other Amazon services available in free tier.
6. Case Study2: Microsoft Azure
7. Case Study 3: Google App Engine
8. Study and Implement IaaS using OpenStack
9. Implement Identity Management feature using OpenStack
10. Security Rules for Application and Transport Layer Protocols in EC2
16MB4201 – FINANCIAL ANALYSIS AND PROJECT MANAGEMENT
IV Year B. Tech. CSE-II Sem

Pre requisites: None

Course Objective
Develop ability to
1. Familiarize and acquaint the student with accounting concepts and analysis.
2. Evaluate alternative techniques for analyzing project opportunities and budgeting capital.
3. Understand the various costs of capital and calculate these costs.
4. Recognize the significance of capital structure and examine its importance in decision making along with dividends and working capital.
5. Understand the concept and stages in project management.

Course Outcomes (COs)
At the end of the course, Students would be able to
CO1. Learn financial accounting concepts and analyze data.
CO2. Understand the role of capital budgeting in decision making.
CO3. Apply the concepts of capital structure in financial decision making.
CO4. Applications of Project management.
CO5. Appreciate Risk Management concepts

UNIT-I: A) Introduction to Financial Accounting
Definition, branches of accounting, accounting concepts and conventions, types and principles of accounting, accounting cycle, journal, ledger and Trial Balance and final accounts (simple problems) and types of financial statement analysis.


UNIT-II: Introduction to Financial Management and Capital Budgeting

UNIT-III: Financing Decision
Concepts and measurement of cost of capital, computation of cost of debt, cost of equity, cost of preference shares, and cost of retained earnings; concept weighted average cost of capital and marginal cost of capital.
Capital Structure: Optimal capital structure, factors influencing the capital structure, financial leverage, operating leverage and combined leverage.

UNIT-IV: Dividend decision and Working Capital Management
Concept, types of dividends, models of dividend theories. Concepts of working capital management, types and components of working capital (cash, marketable securities, receivable management inventory management).
UNIT-V: A) Basics of Project Management: Introduction, need for project management, project management knowledge areas and processes, the project life cycle.

B) Project Risk Management: Introduction, risk, risk management, role of risk management in overall project management, steps in risk management, risk identification, risk analysis, reducing risks.

TEXT BOOKS

REFERENCE BOOKS
16CS4201 – NEURAL NETWORKS
(PROFESSIONAL ELECTIVE - IV)

IV Year B. Tech. CSE-II Sem

Prerequisites: None

Course Objectives
Develop ability to
1. Understand neural network, models of neuron and knowledge representation
2. Understand learning processes, such as, error correction learning, memory based learning, Hebbian learning and Boltzman learning
3. Understand single layer and multi layer perceptrons and also describe application areas of each of them.
4. Understand the importance of back propagation and self organization maps.
5. Understand neuro dynamics and Hopfiled models.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Describe neural network, models of neuron and knowledge representation
CO2. Describe learning processes, such as, error correction learning, memory based learning, Hebbian learning and Boltzman learning
CO3. Differentiate single layer and multi layer perceptrons and also describe application areas of each of them.
CO4. Highlight the importance of back propagation and self organization maps.
CO5. Explain neuro dynamics and Hopfiled models.

UNIT I
INTRODUCTION - What is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks (p. no’s 1 –49)

LEARNING PROCESS 1 – Error Correction learning, Memory based learning, Hebbian learning, (50-55)

UNIT II
LEARNING PROCESS 2: Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process, (p. no’s 50 –116)

SINGLE LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perception –convergence theorem, Relation between perception and Bayes classifier for a Gaussian Environment (p. no’s 117 –155)
UNIT III
MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, (p. no’s 156 – 201)

BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning. (p. no’s 202 –234)

UNIT IV
SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification, Hierarchal Vector quantilizer, contextmel Maps (p. no’s 443 –469, 9.1 –9.8 )

UNIT V
NEURO DYNAMICS – Dynamical systems, stvability of equilibrium states, attractors, neurodynamical models, manipulation of attractors’ as a recurrent network paradigm (p. no’s 664 –680, 14.1 –14.6)

HOPFIELD MODELS – Hopfield models, computer experiment I (p. no’s 680-701, 14.7 –14.8)

TEXT BOOK:

REFERENCE BOOKS:
16CS4202 – MACHINE LEARNING  
(Professional Elective- IV) 

IV Year B. Tech. CSE-II Sem  

Prerequisites: None 

Course Objectives 
Develop ability to 
1. Understand concept learning and general to specific ordering techniques of machine learning to solve problems 
2. Understand decision tree learning and artificial neural networks to solve problems 
3. Understand evaluation of hypothesis and implement Bayesian learning technique 
4. Understand computation learning theory and instance based learning to solve problems 
5. Understand genetic learning and reinforcement learning and their application to various problems 

Course Outcomes (COs) 
After completion of the course, student would be able to 
CO1. Apply concept learning and general to specific ordering techniques of machine learning to solve problems 
CO2. Use decision tree learning and artificial neural networks to solve problems 
CO3. Implement evaluation of hypothesis and implement Bayesian learning technique 
CO4. Use computation learning theory and instance based learning to solve problems 
CO5. Describe genetic learning and reinforcement learning and their application to various problems 

UNIT-I 

Concept Learning and General - to - Specific ordering: Introduction, A concept learning Task, Concept learning as Search, Find-S, Version Spaces And Candidate Elimination Algorithms, Remarks, Inductive Bias. 

UNIT-II 
Decision Tree Learning: Introduction, Decision Tree Representation, Problems for Decision Tree Learning, Basic Decision Tree Learning Algorithms, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning. 

Artificial Neural Network: Neural Network Representation, Problems for Neural Networks, Perceptrons, Multilayer and Back Propagation Algorithm, Remarks on Back Propagation Algorithm, Face Recognition example. 

UNIT-III

Bayesian Learning: Introduction, Bayes theorem, Bayes theorem and Concept Learning, Maximum Likelihood and Least-Squared Error Hypothesis, Maximum Likelihood for Predicting Probabilities, Minimum Description Length Principle, Bayes Classifier, Gibbs algorithm, Naïve Bayes Classifier, Bayesian Belief Networks, EM Algorithm

UNIT-IV

Instance Based Learning: K-Nearest Neighborhood Learning, Locally Weighted Regression, Radial basis function, Case Based reasoning.

UNIT-V

Reinforcement Learning: Introduction, learning task, Q Learning, Non-Deterministic Actions & rewards, temporal different learning, Generalizing from Examples, Relation to Dynamic Programming

TEXT BOOK(S)

REFERENCE BOOK(S)
1. The Elements of Statically Learning, Trevor Has tie, Robert Tibshirani & Jerome Friedman, Springer Verlag, 2001
16CS4203 – HUMAN COMPUTER INTERACTION  
(PROFESSIONAL ELECTIVE - IV)  
IV Year B. Tech. CSE-II Sem

Prerequisites: None

Course Objectives
Develop ability to
1. Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction.
2. Recognize how a computer system may be modified to include human diversity
3. Be aware of mobile HCI
4. Learn the guidelines for user interface.

Course Outcomes (COs)
After completion of the course, student would be able to
CO1. Design effective dialog for HCI
CO2. Design effective HCI for individuals and persons with disabilities
CO3. Assess the importance of user feedback
CO4. Explain the HCI implications for designing multimedia/ecommerce/e-learning Web sites
CO5. Develop meaningful user interface.

UNIT I: FOUNDATIONS OF HCI

UNIT II: DESIGN & SOFTWARE PROCESS

UNIT III: MODELS AND THEORIES
Cognitive models –Socio-Organizational issues and stake holder requirements –Communication and collaboration models

UNIT IV: MOBILE HCI
UNIT V: WEB INTERFACE DESIGN

TEXT BOOK(S)

REFERENCE BOOK(S)
16CS4204 – INTERNET OF THINGS
(PROFESSIONAL ELECTIVE - IV)

IV Year. B.Tech. CSE – II Sem

Prerequisites: None

Course Objectives

Develop ability to
1. Understand definition, design and characteristics of internet of things
2. Understand the similarities and dissimilarities between IoT and M2M
3. Use python programming language to write programs
4. Understand various IoT physical devices and endpoints
5. Understand the suitability of IoT physical servers and cloud offerings for any given problem.

Course Outcomes (COs)

After completion of the course, student would be able to

CO1. Describe definition, design and characteristics of internet of things
CO2. Highlight the similarities and dissimilarities between IoT and M2M
CO3. Write programs using python programming language
CO4. Describe various IoT physical devices and endpoints
CO5. Highlight the suitability of IoT physical servers and cloud offerings for any given problem.

UNIT I


UNIT II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER

UNIT III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

UNIT IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI- Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.
UNIT V
IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API

TEXT BOOK(S)
16MB4251 – ENTREPRENEURSHIP
(OPEN ELECTIVE-IV)

IV Year. B.Tech. CSE – II Sem

Pre requisites: None

Course Objectives
Develop ability to
1. Understand the mindset of the entrepreneurs.
2. Analyze the financial aspects of establishing an enterprise.
3. Learn entrepreneurial activities and determine strategies for launching.
4. Identify the challenges of entrepreneurship and develop an idea on the entrepreneurial framework.
5. Apply strategic perspectives in entrepreneurship.

Course Outcomes (COs)
At the end of the course, student would be able to
CO1. Explore and identify the entrepreneurial traits.
CO2. Identify various funding agencies and role of IPR.
CO3. Imagine and identify opportunities to launch new ventures.
CO4. Address entrepreneurial challenges.

UNIT-I: Introduction to Entrepreneurship
Meaning, importance, entrepreneurship characteristics, women entrepreneurs, classifications of entrepreneurs, myths of entrepreneurship, qualities of entrepreneurship, competencies, attitude function and nature of forms of entrepreneurship.

UNIT-II: Promotion and financial aspects of entrepreneurship
Idea generation- opportunities- SWOT analysis, patents and trademark, intellectual property rights, source of capital, debt capital, seed capital, venture capital- informal agencies in financing entrepreneurs. Government grants and subsidies, types of investors and private offerings.

UNIT-III: Launching entrepreneurial ventures
Opportunities identification- entrepreneurial imagination and creativities – the nature of the creativity process innovation and entrepreneurial- methods to initiate venture creating, new ventures-acquiring and established entrepreneurial venture, franchising hybrid-disadvantage of franchising.

UNIT-IV: Legal challenges of entrepreneurship
Intellectual property protection patents, copy rights-trademarks and trade secret. Avoiding pitfalls-formulation of the entrepreneurial plan-the challenges of new venture startups-poor financial understanding-critical factors for new venture development, the evaluation process, feasibility criteria approach.
UNIT-V: Strategic perspectives in entrepreneurship
Strategic planning-strategic actions-strategic positioning-business stabilization-building the adoptive firms-understanding the growth stage unique managerial concern of growing ventures.

TEXT BOOKS

REFERENCE BOOKS
16EE4253 – RENEWABLE ENERGY SOURCES  
(OPEN ELECTIVE-IV)  
IV Year. B.Tech. CSE – II Sem  

Prerequisites: None  

Course Objectives  
Develop ability to  
1. Understand the basic concepts of solar energy  
2. Understand the methods of storage of solar energy  
3. Understand basic concepts of wind energy, biomass energy.  
4. Understand basic concepts of geothermal energy and ocean energy  
5. Understand the need of direct energy conversion.  

Course Outcomes (COs)  
At the end of the course student would be able to  
CO1. Get thorough knowledge on various types of renewable energy sources  
CO2. Develop storage systems of solar energy for different applications.  
CO3. Get thorough knowledge on hybrid energy systems  
CO4. Get thorough knowledge on principles of direct energy conversion  
CO5. Apply the above conceptual things to real world electrical and electronic problems  

UNIT-I  
Principles of solar radiation: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, Instruments for measuring solar radiation and sun shine, solar radiation data.  

UNIT-II  
Solar Energy Collection, Storage & Applications:  
Collection: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.  
Storage & Applications: Different methods, sensible, latent heat and stratified storage, solar ponds. Solar applications - solar heating / cooling technique, solar distillation and drying, photovoltaic energy conversion.  

UNIT -III  
Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Bertz criteria.  

UNIT- IV  
Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India.

UNIT-V
Direct Energy Conversion: Need for DEC, Carnot cycle, limitations, and principles of DEC.

TEXT BOOKS
2. Introduction to renewable energy, Vaughn Neison, CRC Press (Taylor & Francis)

REFERENCE BOOKS
16EC4254 – BIOMEDICAL INSTRUMENTATION
(OPEN ELECTIVE-IV)

IV Year. B.Tech. CSE – II Sem

Prerequisite(s): None

Note: No detailed mathematical treatment is required and only elementary treatment is sufficient.

Course Objectives
Develop ability to
1. Learn the basics of human physiology
2. Understand the basics of bio-medical transducers and recorders.
3. Understand the applications of measuring, recording and monitoring instruments.
4. Understand the concepts of various medical instruments
5. Understand the concepts of various supporting systems.

Course Outcomes: At the end of the course, student would be able to
CO1. Explain the functioning of different human physiological systems.
CO2. Explain the operations of transducers and recorders used for bio-medical applications.
CO3. Explain the principles of medical imaging systems.
CO4. Explain the principles of monitoring instruments used for bio-medical applications.
CO5. Explain the need for health supporting systems.

UNIT I - Human Physiology
Introduction to generalized medical instrumentation system, components of instrumentation system, physiological system of human body, cardiovascular system. Respiratory system, Nervous system, generation of bioelectric potentials, Action potential, resting potential, Neuronal communication.

UNIT II - Bio- Potential Electrodes, Transducers And Recorders
The electrode – electrolyte interface, Polarization, Ag/Agcl Electrodes, Body surface electrodes, Internal Electrodes. Transducers in general, PressureTransducers, Temperature transducers, pulse sensors, Basic recording systems.

UNIT III - Medical Imaging Systems
Basics of medical imaging systems, block diagrams and applications of - X-ray machine, Computer Tomography, Magnetic Resonance Imaging systems, Ultrasonic Imaging systems.

UNIT IV - Monitoring Systems
Basic principles of -Stethoscope, BP measuring Instrument, Electrocardiography(ECG), Electroencephalography( EEG) and Electromyography(EMG) recorders,

UNIT V - Supporting Systems
Basic principles of Pacemaker system, Transcutaneous Electrical Nerve stimulation (TENS), surgical diathermy, Heart lung machine, Hemo Dialysis, Lithotripsy.
TEXT BOOKS

REFERENCE BOOKS
IV Year. B.Tech. CSE – II Sem

Pre-requisites: None.

Course Objectives

Develop ability to

1. Know the working principle of earth moving equipment
2. Study types and working principle of conveying and hoisting equipment
3. Understand the working principle of concrete producing, concrete screening and concrete mixing equipment
4. Know the principle of pneumatic equipment and tools

Course Outcomes (COs)

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

CO1. Understand the basics of material handling systems by using earth moving equipments.
CO2. Understand working principles of various conveying systems used in industries.
CO3. Understand the process of aggregating the materials with crushers and screens.
CO4. Understand the working principles of pneumatic equipments.
CO5. Apply the various methods for cost minimization along with maintenances

UNIT-I: Introduction: Material handling principles; material handling equipment and material handling systems.


UNIT-II: Conveying Equipment: Belt Conveyor, Screw Conveyor, Bucket Conveyor, Aerial ropeway,


UNIT-V: Cost minimization & Maintenance:

Cost minimization methods of material handling- Maintenance of Material Handling Equipments, Safety in material handling, Ergonomics of Material Handling equipment.
TEXT BOOKS
3. Construction Equipment & its Planning & Application, Mahesh Varma Dr, Metropolitan Book Co., 3rdEdn., 2009

REFERENCE BOOKS
16CE4256 – DISASTER MITIGATION AND MANAGEMENT

(OPEN ELECTIVE-IV)

IV Year. B.Tech. CSE – II Sem

Prerequisite(s): None.

Course Objectives:
Develop ability to
1. Acquire knowledge on disasters and assess their impact.
2. Comprehend the monitoring techniques of disasters
3. Understand the issues and policies involved in the disaster management.
4. Evaluate the pre-disaster risk and vulnerability reduction strategies.
5. Assess the role of NGO’s, Government bodies and Public in the disaster mitigation and Management.

Course Outcomes:
At the end of the course, student would be able to
CO1. Explain the different types of disasters.
CO2. Evaluate the impact of disasters on the community.
CO4. Recommend appropriate vulnerability reduction strategy and risk reducing techniques.
CO5. Estimate the disaster infrastructure development and role of NGO’s, Government bodies and Public in the disaster mitigation and management.

UNIT–I

UNIT–II

UNIT–III

UNIT–IV
Cyclones: Tropical cyclones & Local storms – Destruction by tropical cyclones & local storms (causes, distribution, human adjustment, perception & mitigation)

Floods: Causes of floods – Flood hazards – Flood control measures (Human adjustment, perception & mitigation).


Biological hazards/ disasters: Population Explosion.

UNIT – V
Emerging approaches in Disaster Management – Three Stages
1) Pre-disaster stage (preparedness)
2) Emergency Stage
3) Post Disaster stage – Rehabilitation

TEXT BOOKS
2. Disaster Management, Dr. Mrinalini Pandey, Wiley India Pvt Ltd., 2014.

REFERENCE BOOKS
2. Natural Hazards and Disasters, Donald Hyndman and David Hyndman, Cengage Learning, 2013.
16MA4257 – ACTUARIAL STATISTICS
(OPEN ELECTIVE-IV)

Prerequisite(s): None

Course Objectives
Develop ability to
1. Determine present and future values of investment projects, annuities and be able to compute outstanding principal (capital) as well as interest using loan schedules.
2. Provide a motivation, based on a normative theory of individual behavior in the face of uncertainty, for the study of insurance models.
3. Measure the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time.
4. Understand benefits of life insurance, various insurance policies, payments and premiums.
5. Predict future trends and patterns in the data behavior of processes or metrics over a period of time using time series models. Fit a model and proceed to forecasting and monitoring.

Course Outcomes (COs)
At the end of the course, the student would be able to
CO1. Assess financial loss and profit of an organization or in any business, shares.
CO2. Apply an economic theory that explains the mathematical expectation of the insured loss and profit.
CO3. Organize to assess various risks involved in terms of mortality, claims which can be received, profitability analysis for organization and individuals.
CO4. Analyze Life Insurance policies, Pension plans and Health Care Plans.
CO5. Apply time series models in Economic, Sales, Weather forecasting, Budgetary and stock market analysis, Inventory and Utility studies etc.

UNIT-I : Financial mathematics
Rate of Interest; Normal and effective rates of interest and discount; Accumulated Value; Present value of cash flows; Valuing Cash Flows; Present Value Principals of compound interest; force of interest and discount compound interest; Annuities certain; Deferred annuities, Concepts of different annuities, annuities due, Redemption of Loans, Sinking Funds and Capital redemption assurance.
UNIT-II : Utility Theory
Insurance and Utility Theory; Models for Individual Claims and their sums; Approximations for the distribution of Sums; Application to Insurance; Survival function Time until-death for a person age x; Curate future life time.

UNIT-III : Mortality
Functions and laws of mortality tables; Select ultimate and aggregate mortality tables; Functions other than yearly policy Values; Surrender values and paid up Values; Bonus Special policies; Joint life and last survivor statuses; The Mortality tables.

UNIT-IV : Life Insurance and Premiums
Insurance payable at the moment’s of death and at the end of the year of death-level benefit insurance; endowment insurance; differed insurance and varying benefit insurances; recursions; commutation functions; Single payment.Net Premiums and Net Premium Reserves of insurance policies; Insurance policies with expenses and bonuses introduced; Gross premiums and Gross premium reserves of insurance policies.

UNIT-V : Time Series Analysis and Forecasting
Basic concepts of Time Series Analysis; Components of Time Series: Moving Averages, Exponential Smoothing, Autoregressive and Partial Autoregressive Functions; Forecasting Models: Moving/Autoregressive Moving Averages (MA,AR,ARMA and ARIMA); Prediction limits, Forecast Updating and Holt-Winter’s Methods; Box-Jenkins Method of modeling.

TEXT BOOKS

REFERENCE BOOKS
1. Introduction to Time Series Analysis and Forecasting, Cheryl L. Jennings, Douglas C. Montgomery, and Murat Kulahci
5. Time series analysis, forecasting and control Book by George E. P. Box