

## SEMESTER- I

# BE COMPUTER ENGINEERING (2015 PAT)

### **410241: High Performance Computing**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Describe different parallel architectures, inter-connect networks, programming models
- Develop an efficient parallel algorithm to solve given problem
- Analyze and measure performance of modern parallel computing systems
- Build the logic to parallelize the programming task

### **410242: Artificial Intelligence and Robotics**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Identify and apply suitable Intelligent agents for various AI applications
- Design smart system using different informed search / uninformed search or heuristic approaches.
- Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem.
- Apply the suitable algorithms to solve AI problems

### **410243: Data Analytics**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Write case studies in Business Analytic and Intelligence using mathematical models
- Present a survey on applications for Business Analytic and Intelligence
- Provide problem solutions for multi-core or distributed, concurrent/Parallel environments
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### **Elective I 410244(A): Digital Signal Processing**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Understand the mathematical models and representations of DT Signals and Systems
- Apply different transforms like Fourier and Z-Transform from applications point of view.
- Understand the design and implementation of DT systems as DT filters with filter structures and different transforms.
- Demonstrate the knowledge of signals and systems for design and analysis of systems
- Apply knowledge and use the signal transforms for digital processing applications

### **Elective I 410244(B): Software Architecture and Design**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Express the analysis and design of an application
- Specify functional semantics of an application
- Evaluate software architectures
- Select and use appropriate architectural styles and software design patterns

### **Elective I 410244(C): Pervasive and Ubiquitous Computing**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Design and implement primitive pervasive applications
- Analyze and estimate the impact of pervasive computing on future computing applications and society
- Develop skill sets to propose solutions for problems related to pervasive computing system
- Design a preliminary system to meet desired needs within the constraints of a particular problem space

### **Elective I 410244(D): Data Mining and Warehousing**

#### **Course Outcomes:**

On completion of the course the student should be able to-

- Apply basic, intermediate and advanced techniques to mine the data
- Analyze the output generated by the process of data mining
- Explore the hidden patterns in the data
- Optimize the mining process by choosing best data mining technique

### **Elective II 410245(A): Distributed Systems**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Able to learn and apply the concept of remote method invocation and Remote Procedure Calls
- Able to analyze the mechanism of peer to peer systems and Distributed File Systems
- Demonstrate an understanding of the challenges faced by current and future distributed Systems

### **Elective II 410245(B): Software Testing and Quality Assurance**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
- Design and develop project test plan, design test cases, test data, and conduct test operations
- Apply recent automation tool for various software testing for testing software
- Apply different approaches of quality management, assurance, and quality standard to software system
- Apply and analyze effectiveness Software Quality Tools

### **Elective II 410245(C): Operations Research**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Identify the characteristics of different types of decision-making environments
- Use appropriate decision making approaches and tools
- Build various dynamic and adaptive models
- Develop critical thinking and objective analysis of decision problems
- Apply the OR techniques for efficacy

### **Elective II 410245(D): Mobile Communication**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Justify the Mobile Network performance parameters and design decisions.
- Choose the modulation technique for setting up mobile network.
- Formulate GSM/CDMA mobile network layout considering futuristic requirements which conforms to the technology.

- Use the 3G/4G technology based network with bandwidth capacity planning.
- Percept to the requirements of next generation mobile network and mobile applications.

## **410248:Project Work Stage I**

### **Course Outcomes:**

On completion of the course, student will be able to–

- Solve real life problems by applying knowledge.
- Analyze alternative approaches, apply and use most appropriate one for feasible solution.
- Write precise reports and technical documents in a nutshell.
- Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work,
- Inter-personal relationships, conflict management and leadership quality.

## **TE Computer Engineering: (2015 PAT)**

### **310241: Theory of Computation**

**Teaching Scheme:**

**TH: 03 Hours/Week**

**Credit**

**03**

**Examination Scheme:**

**In-Sem (Paper): 30 Marks**

**End-Sem (Paper): 70 Marks**

### **Course Outcomes:**

On completion of the course, student will be able to–

- Able to design deterministic Turing machine for all inputs all outputs
- Able to subdivide problem space based on input subdivision using constraints
- Able to apply linguistic theory

### **310242: Database Management Systems**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Design E-R Model for given requirements and convert the same into database tables.
- Use database techniques such as SQL & PL/SQL.
- Use modern database techniques such as NOSQL.
- Explain transaction Management in relational database System.
- Describe different database architecture and analyses the use of appropriate architecture in real time environment.
- Students will be able to use advanced database Programming concepts Big Data – HADOOP

### **310243: Software Engineering and Project Management**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Decide on a process model for a developing a software project
- Classify software applications and Identify unique features of various domains
- Design test cases of a software system.
- Understand basics of IT Project management.
- Plan, schedule and execute a project considering the risk management.
- Apply quality attributes in software development life cycle.

### **310244: Information Systems and Engineering Economics**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Understand the need, usage and importance of an Information System to an organization.
- Understand the activities that are undertaken while managing, designing, planning, implementation, and deployment of computerized information system in an organization.
- Further the student would be aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organizations
- Outline the past history, present position and expected performance of a company engaged in engineering practice or in the computer industry.
- Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
- Be able to carry out and evaluate benefit/cost, life cycle and breakeven analyses on one or more economic alternatives.

### **310245: Computer Networks**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Analyze the requirements for a given organizational structure to select the most appropriate networking architecture, topologies, transmission mediums, and technologies
- Demonstrate design issues, flow control and error control
- Analyze data flow between TCP/IP model using Application, Transport and Network Layer Protocols.
- Illustrate applications of Computer Network capabilities, selection and usage for various sectors of user community.
- Illustrate Client-Server architectures and prototypes by the means of correct standards and technology.
- Demonstrate different routing and switching algorithms

## **310246: Skill Development Lab**

### **Course Outcomes:**

On completion of the course, student will be able to–

- \_ Evaluate problems and analyze data using current technologies in a wide variety of business and organizational contexts.
- \_ Create data-driven web applications
- \_ Incorporate best practices for building applications
- \_ Employ Integrated Development Environment(IDE) for implementing and testing of software solution
- \_ Construct software solutions by evaluating alternate architectural patterns.

## **SE Computer Engineering**

### **210241: Discrete Mathematics**

**Teaching Scheme:**

**Credit**

**Examination Scheme:**

**TH: 04 Hours/Week**

**04**

**In-Sem (online): 50 Marks**

**Course Outcomes:**

**End-Sem (paper): 50 Marks**

On completion of the course, student will be able to–

- \_ Solve real world problems logically using appropriate set, function, and relation models and interpret the associated operations and terminologies in context.
- \_ Analyze and synthesize the real world problems using discrete mathematics

### **210242: Digital Electronics & Logic Design**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Realize and simplify Boolean Algebraic assignments for designing digital circuits using K-Maps.
- Design and implement Sequential and Combinational digital circuits as per the specifications.
- Apply the knowledge to appropriate IC as per the design specifications.
- Design simple digital systems using VHDL.
- Develop simple embedded system for simple real world application.

### **210243: Data Structures and Algorithms**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- \_ To discriminate the usage of various structures in approaching the problem solution.
- \_ To design the algorithms to solve the programming problems.
- \_ To use effective and efficient data structures in solving various Computer Engineering domain problems.
- \_ To analyze the problems to apply suitable algorithm and data structure.
- \_ To use appropriate algorithmic strategy for better efficiency

## **210244: Computer Organization and Architecture**

### **Course Outcomes:**

On completion of the course, student will be able to–

- Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
- Analyze the principles of computer architecture using examples drawn from commercially available computers.
- Evaluate various design alternatives in processor organization.

## **210245: Object Oriented Programming**

### **Course Outcomes:**

On completion of the course, student will be able to–

- Analyze the strengths of object oriented programming
- Design and apply OOP principles for effective programming
- Develop programming application using object oriented programming language C++
- Percept the utility and applicability of OOP

## SEMESTER –II

### BE Computer Engineering

#### 410250: Machine Learning

##### Course Outcomes:

- Distinguish different learning based applications
- Apply different preprocessing methods to prepare training data set for machine learning.
- Design and implement supervised and unsupervised machine learning algorithm.
- Implement different learning models
- Learn Meta classifiers and deep learning concepts

#### 410251: Information and Cyber Security

##### Course Outcomes:

- Gauge the security protections and limitations provided by today's technology.
- Identify information security and cyber security threats.
- Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.
- Build appropriate security solutions against cyber-attacks.

#### Elective III 410252(A): Advanced Digital Signal Processing

- Understand and apply different transforms for the design of DT/Digital systems
- Explore the knowledge of adaptive filtering and Multi-rate DSP
- Design DT systems in the field/area of adaptive filtering, spectral estimation and multi-rate DSP
- Explore use of DCT and WT in speech and image processing
- Develop algorithms in the field of speech , image processing and other DSP applications

#### Elective III 410252(B): Compilers

- Design and implement a lexical analyzer and a syntax analyzer
- Specify appropriate translations to generate intermediate code for the given programming language construct
- Compare and contrast different storage management schemes
- Identify sources for code optimization

#### Elective III 410252(C): Embedded and Real Time Operating Systems

- Recognize and classify embedded and real-time systems
- Explain communication bus protocols used for embedded and real-time systems
- Classify and exemplify scheduling algorithms
- Apply software development process to a given RTOS application
- Design a given RTOS based application

#### Elective III 410252(D): Soft Computing and Optimization Algorithms

- Apply soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy inference systems and genetic algorithms
- Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications.

#### Elective IV 410253(A): Software Defined Networks

- Interpret the need of Software Defined Networking solutions.
- Analyze different methodologies for sustainable Software Defined Networking solutions Select best practices for design, deploy and troubleshoot of next generation networks. Develop programmability of network elements.
- Demonstrate virtualization and SDN Controllers using Open Flow protocol

#### Elective IV 410253(B): Human Computer Interface

- Evaluate the basics of human and computational abilities and limitations.
- Inculcate basic theory, tools and techniques in HCI.
- Apply the fundamental aspects of designing and evaluating interfaces.
- Apply appropriate HCI techniques to design systems that are usable by people

### **Elective IV 410253(C): Cloud Computing**

- To install cloud computing environments.
- To develop any one type of cloud
- To explore future trends of cloud computing

### **410256: Project Work Stage II**

- Show evidence of independent investigation
- Critically analyze the results and their interpretation.
- Report and present the original results in an orderly way and placing the open questions in the right perspective.
- Link techniques and results from literature as well as actual research and future research lines with the research.
- Appreciate practical implications and constraints of the specialist subject

## **Third Year of Computer Engineering (2015 Course)**

### **310250: Design and Analysis of Algorithms**

**Teaching Scheme:**

**Credit**

**TH: 04 Hours/Week**

**04**

**Examination Scheme:**

**In-Sem (Paper): 30 Marks**

**End-Sem (Paper): 70 Marks**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- \_ Formulate the problem
- Analyze the asymptotic performance of algorithms
- Decide and apply algorithmic strategies to solve given problem
- Find optimal solution by applying various methods

### **310251: Systems Programming and Operating System**

**Teaching Scheme:**

**Credit**

**TH: 04 Hours/Week**

**04**

**Examination Scheme:**

**In-Sem (Paper): 30 Marks**

**End-Sem (Paper): 70 Marks**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- \_ Analyze and synthesize system software
- \_ Use tools like LEX & YACC.
- Implement operating system functions.

### **310252: Embedded Systems and Internet of Things**

**Teaching Scheme:**

**Credit**

**TH: 04 Hours/Week**

**04**

**Examination Scheme:**

**In-Sem (Paper): 30 Marks**

**End-Sem (paper): 70 Marks**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Implement an architectural design for IoT for specified requirement
- Solve the given societal challenge using IoT
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Choose between available technologies and devices for stated IoT challenge

### **310253: Software Modeling and Design**

**Teaching Scheme:**

**TH: 03 Hours/Week**

**Credits**

**03**

**Examination Scheme:**

**In-Sem (Paper): 30 Mar**

**End-Sem (Paper): 70 M**

#### **Course Outcomes:**

On completion of the course, student will be able to–

- Analyze the problem statement (SRS) and choose proper design technique for designing web-b desktop application



**Course Outcomes:**

On completion of the course, student will be able to–

- \_ Understand the internals of language translators
- \_ Handle tools like LEX & YACC.
- \_ Understand the Operating System internals and functionalities with implementation point of view

**Second Year of Computer Engineering/IT (2015 Course)****207003: Engineering Mathematics III****Teaching Scheme:****Credit****Examination Scheme:****TH: 04 Hours/Week****05****In-Sem(online): 50 Marks****TUT: 01 Hour/Week****End-Sem(paper): 50 Marks****TW: 25 Marks****Course Outcomes:**

On completion of the course, student will be able to–

- Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
- Solve problems related to Fourier transform, Z-Transform and applications to Signal and Image processing.
- Apply statistical methods like correlation, regression analysis and probability theory for analysis and prediction of a given data as applied to machine intelligence.
- Perform vector differentiation and integration to analyze the vector fields and apply to compute line, surface and volume integrals.
- Analyze conformal mappings, transformations and perform contour integration of complex functions required in Image processing, Digital filters and Computer graphics.

**210251: Computer Graphics****Teaching Scheme:****Credit****Examination Scheme:****TH: 04 Hours/Week****04****In-Sem(online): 50 Marks****End-Sem(paper): 50 Marks****Course Outcomes:**

On completion of the course, student will be able to–

- Apply mathematics and logic to develop Computer programs for elementary graphic operations
- Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics
- Develop the competency to understand the concepts related to Computer Vision and Virtual reality
- Apply the logic to develop animation and gaming programs

**210252: Advanced Data Structures****Teaching Scheme:****Credit****Examination Scheme:****TH: 04 Hours/Week****04****In-Sem(online): 50 Marks****End-Sem(paper): 50 Marks**

**Course Outcomes:**

On completion of the course, student will be able to–

- \_ To apply appropriate advanced data structure and efficient algorithms to approach the problems of various domain.
- \_ To design the algorithms to solve the programming problems.
- \_ To use effective and efficient data structures in solving various Computer Engineering domain problems.
- \_ To analyze the algorithmic solutions for resource requirements and optimization
- \_ To use appropriate modern tools to understand and analyze the functionalities confined to the data structure usage.

**210253: Microprocessor****Teaching Scheme:****TH: 04 Hours/Week****Credit****04****Examination Scheme:****In-Sem(online): 50 Marks****End-Sem(paper): 50 Marks****Course Outcomes:**

On completion of the course, student will be able to–

- \_ To apply the assembly language programming to develop small real life embedded application.
- \_ To understand the architecture of the advanced processor thoroughly to use the resources for programming
- \_ To understand the higher processor architectures descended from 80386 architecture

**210254: Principles of Programming Languages****Teaching Scheme:****TH: 03 Hours/Week****Credit****TH: 03****Examination Scheme:****In-Sem(online): 50 Marks****End-Sem(paper): 50 Marks****Course Outcomes:**

On completion of the course, student will be able to–

- \_ To analyze the strengths and weaknesses of programming languages for effective and efficient program development.
- \_ To inculcate the principles underlying the programming languages enabling to learn new programming languages.
- \_ To grasp different programming paradigms
- \_ To use the programming paradigms effectively in application development.

**AC2-I: Water Management****Course Outcomes:**

On completion of the course, learner will be able to–

- Understanding of the global water cycle and its various processes
- Understanding of climate change and their effects on water systems
- Understanding of Drinking treatment and quality of groundwater and surface water
- \_ Understanding of the Physical, chemical, and biological processes involved in water treatment and distribution.

