ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S

COLLEGE OF ENGINEERING, PUNE - 1

Program outcomes, program specific outcomes and course outcomes

DEPARTMENT OF CCCOMPUTER ENGINEERING

COURSE OUTCOMES 2016-17

COURSE PATTERN 2015 (SE, TE)

COURSE PATTERN 2012 (BE)

COURSE PATTERN 2012 (ME)

SE COMPUTER

YEAR	COURSE CODE	COURSE NAME	COURSE OUTCOMES
S E [SEMESTER –III, TERM-I]	210241	1) Discrete Mathematics	1. Students will be able to apply set theory and propositional logic to real world problems.
			2.Students will be able to analyze functions and relations along with its properties.
			3. Students will be able to apply permutations and combinations for problem solving.
			4. Students will be able to solve problems using different types of graphs
			5. Able to apply data structure, like trees, and the algorithms that build and manipulate them.
			6. Understand the concepts of isomorphism and homomorphism for groups and rings.
	210242	2) Digital Electronics and Logic Design	1. Realize and simplify Boolean Algebraic assignments for designing digital circuits using KMaps.
			2. Design and implement Sequential and Combinational digital circuits as per the specifications.
			3. Apply the knowledge to appropriate IC as per the design specifications.
			4. Design simple digital systems using VHDL.
			5. Design combinational circuits using PLDs
			6. Develop simple embedded system for simple real world application
	210243	3) Data Structures and Algorithms	1. To understand the analysis of algorithm.
			2. To discriminate the usage of various structures in approaching the problem solution.
			3. To design the algorithms to solve the programming problems.
			4. To use effective and efficient data structures in solving various Computer Engineering domain problems.
			5. To analyze the problems to apply suitable algorithm and data structure.
			6. To use of data structures in various real time applications.
	210244	4) Computer Organization and Architecture	1. Students are able to explain the structure, function and characteristics of computer systems
			2. Students are able to describe functionality of each memory element its hierarchy and demonstrate the concept of memories in modern processor

			3. Students are able to Explain and identify different methods for computer I/O.
			4. Students are able to identify the elements of modern instructions sets and instruction format.
			5. Students are able to describe various design alternatives for processor.
			6. Students are able to understand how to improve performance of a digital computer by designing and sequencing instructions using different techniques like hardwired control and micro programmed control.
	210245	**5) Object Oriented Programming**	1. Ability to understand the principles of Object Oriented Programming
			2. Ability to understand object-oriented concepts such as data abstraction, encapsulation, inheritance, dynamic binding, and polymorphism
			3. Ability to understand virtual functions
			4. Ability to understand the basics of templates & exception handling
			5. Ability to understand file handling concept
			6. Ability to understand the standard template library
S E [SEMESTER –IV, TERM-II]	**207003**	**1) Engineering Mathematics III**	1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
			2. Solve problems related to Fourier transform, Z-Transform and applications to Signal and Image processing.
			3. Apply statistical methods like correlation, regression analysis and probability theory for analysis and prediction of a given data as applied to machine intelligence.
			4. Perform vector differentiation and integration to analyze the vector fields and apply to compute line, surface and volume integrals.
			5. Analyze conformal mappings, transformations and perform contour integration of complex functions required in Image processing, Digital filters and Computer graphics.
	210251	**2) Computer Graphics**	1. Apply mathematics and logic to develop Computer programs for elementary graphic operations
			2. Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics
			3. Develop the competency to understand the concepts related to Computer Vision and Virtual reality
			4. Apply the logic to develop animation and gaming programs
	210252	**3) Advanced Data Structures**	1. To apply appropriate advanced data structure and efficient algorithms to approach the problems of various domain.
			2. To design the algorithms to solve the programming problems.
			3. To use effective and efficient data structures in solving various Computer Engineering domain problems.
			4. To analyze the algorithmic solutions for resource requirements and optimization
			5. To use appropriate modern tools to understand and analyze the functionalities confined to the data structure usage.
			6. To solve the real application data problem through data structure
	210253	**4) Microprocessor**	1. Understand the concept of memory segmentation and basic instructions of microprocessor.
			2. Understand address translation mechanism and convert physical address to logical and linear address.
			3. Distinguish different levels of protections
			4. Implement exceptions and interrupts using assembly language.
			5. Differentiate different modes of microprocessor.

			6. Understand co-processor mechanism and Implement Trigonometric and Transcendental operations using coprocessor instructions.
	210254	5) Principles of Programming Languages	1. To analyze the strengths and weaknesses of programming languages for effective and efficient program development.
			2. To inculcate the principles underlying the programming languages enabling to learn new programming languages.
			3. To grasp different programming paradigms
			4. To use the programming paradigms effectively in application development.
			5. Ability to understand basic concepts & broad principles of object oriented programming using JAVA

TE COMPUTER

YEAR	COURS	COURSE NAME	COURSE OUTCOMES
T E [SEMESTER –V, TERM-I]	310241	1) Theory of Computation	1. Subdivide problem space based on input subdivision using constraints.
			2. Identify the regular language using Pumping Lemma.
			3. Generate grammar for language.
			4. Design deterministic Turing machine for all inputs and all outputs.
			5. Parse using Pushdown automata.
			6. Apply linguistic theory.
	310242	2) Database Management Systems	1. Design E-R Model for given requirements and convert the same into database tables
			2. Use Database techniques such as SQL and PL/SQL
			3. Use modern database techniques such as NOSQL
			4. Elaborate and use transaction management in relational database systems
			5. Describe different database architectures and analyze the use of appropriate architecture in real time environment
			6. Use advanced database programming concepts.
	310243	3) Software Engineering & Project Management	1. Decide on a process model for a developing a software project
			2. Classify software applications and Identify unique features of various domains
			3. Design test cases of a software system
			4. Understand basics of IT Project management
			5. Plan, schedule and execute a project considering the risk management
			6. Apply quality attributes in software development life cycle
	310244	4) Information Systems & Engineering Economics	1. Understand the need, usage and importance of an Information System to an organization.
			2. Understand the activities that are undertaken while managing, designing, planning, implementation, and deployment of computerized information system in an organization.
			3. Further the student would be aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful
			4. Outline the past history, present position and expected performance of a company engaged in engineering practice or in the computer

			5. Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.
			6. Be able to carry out and evaluate benefit/Course Outcomest, life cycle and breakeven analyses on one or more economic alternatives.
	310245	**5) Computer Networks**	1. Analyze the requirements for a given organizational structure to select the most appropriate networking architecture, topologies,
			2. Demonstrate design issues, flow control and error control
			3. Analyze data flow between TCP/IP model using Application, Transport and Network Layer Protocols
			4. Illustrate applications of Computer Network capabilities, selection and usage for various sectors of user community.
			5. Illustrate Client-Server architectures and prototypes by the means of correct standards and technology.
			6. Demonstrate different routing and switching algorithms
T E [SEMESTER –VI, TERM-II]	**310250**	**1) Design & Analysis of Algorithms**	1. To identify the strategy for problems in real domain.
			2. To develop the implementation strategy for the complex problems.
			3. To develop the mathematical modelling and optimization methods for the complex problems.
			4. To solve problems for multi-core or distributed or concurrent/Parallel/Embedded environments
			5. To apply the solution to the complexity theory
			6. To apply the adaptive and dynamic algorithms for the Internet of things.
	310251	**2) Systems Programming & Operating System**	1. To analyse System Software and design Assemblers.
			2. To design and implement Macroprocessors, Linker and Loader.
			3. To use tools like LEX and YACC for language translator.
			4. To understand and implement Scheduling Algorithms
			5. To understand and implement Memory Management Schemes
			6. To understand Input/Output Management Schemes
	310252	**3) Embedded Systems & Internet of Things**	1. Implement an architectural design for IoT for specified requirement
			2. Solve the given societal challenge using IoT
			3. Choose between available technologies and devices for stated IoT challenge
	310253	**4) Software Modeling and Design**	1. Analyze the problem statement (SRS) and choose proper design technique for designing web based/ desktop application
			2. Design and analyze an application using UML modeling as fundamental tool
			3. Apply design patterns to understand reusability in OO design
			4. Decide and apply appropriate modern tool for designing and modeling
			5. To learn and understand testing techniques and tools.
			6. Decide and apply appropriate modern testing tool for testing web-based/desktop application
	310254	**5) Web Technology**	1. Student will be able to analyze given assignment to select sustainable web development and design methodology
			2. Student will be able to develop web based application using suitable client side web technologies

			3. Student will be able to develop web based application using suitable server side web technologies.
			4. Student will be able to develop solution to complex problems using appropriate method, technologies, web services and content management
			5. Student will be able to develop client and server side architectures, frameworks.
			6. Student will be able to understand web services and front end advanced technologies.

BE COMPUTER

YEAR	COURS	COURSE NAME	COURSE OUTCOMES
B E [SEMESTER –VII, TERM-I]	**410441**	**1) Design & Analysis of Algorithms**	1. To identify the strategy for problems in real domain.
			2. To develop the implementation strategy for the complex problems.
			3. To develop the mathematical modelling and optimization methods for the complex problems.
			4. To solve problems for multi-core or distributed or concurrent/Parallel/Embedded environments
			5. To apply the solution to the complexity theory
			6. To apply the adaptive and dynamic algorithms for the Internet of things.
	410442	**2) Principles of Modern Compiler Design**	1. Ability to apply the knowledge of LEX tool to develop scanner.
			2. Ability to apply the knowledge of YACC tool to develop parser.
			3. Ability to analyze syntax tree and convert it to an intermediate code
			4. Ability to design, optimize and generate the target code
			5. Ability to apply the OOP concepts with respect to compilation in real time
			6. Ability to use modern compiler tools in basic, concurrent distributed and embedded environments
	410443	**3) Smart System Design and Applications**	1. Understand Learning aspects in artificial intelligence.
			2. Implement problem solving ,optimization ,search algorithm and game.
			3. Apply knowledge representation schemes ,inference and planning.
			4. Handle uncertainity and apply knowledge of reasoning in decision theory.
			5. Understand machine learning and implement it for building smart system.
			6. Understand and implement applications of natural language processing ,image processing, etc.
	410444	**4) Elective-I : Data Mining Techniques and Applications**	1. To distinguish the data mining task and apply preprocessing statistical method for any given raw data.
			2. To discover and measure interesting patterns from different kind of database using Association rules and algorithms.
			3. Ability to use and implement various algorithms for Classification in data mining.
			4. Ability to describe and apply different clustering approaches.
			5. To write programs and methods for Text and Web mining applications.
			6. To solve problems for multi-core or distributed, concurrent/Parallel environments using Reinforcement learning and big data mining.
	410445B	**4) Elective-I : Data Mining**	1. To distinguish the data mining task and apply preprocessing statistical method for any given raw data.
			2. To discover and measure interesting patterns from different kind of database using Association rules and algorithms.

		Techniques and Applications	3. Ability to use and implement various algorithms for Classification in data mining.
			4. Ability to describe and apply different clustering approaches.
			5. To write programs and methods for Text and Web mining applications.
			6. To solve problems for multi-core or distributed, concurrent/Parallel environments using Reinforcement learning and big data mining.
	410445D	**5) Elective-II : Pervasive Computing**	1. To present a survey on pervasive computing building blocks and their relation with Mobile Computing
			2. To understand Pervasive computing devices and environments
			3. To effectively use Human Computer Interaction for different types of systems
			4. To understand adaptive middleware and their usage for Pervasive systems
			5. To analyze security measures in Pervasive Systems
			6. To design multi core or distributed, concurrent/parallel environments for Pervasive systems
	410448	**BE Project**	1. To solve problem in projects;
			2. To develop SRS and other software engineering documents in the project report;
			3. To solve problems using multi-core, distributed, embedded, concurrent/Parallel environments;
			4. To write conference paper;
			5. To demonstrate presentation, communication and team-work skills.
B E [SEMESTER –VIII, TERM-II]	**410449**	**1) Software Design Methodologies & Testing**	1. To present a design and model using UML for a given software system.
			2. To present a survey on architectural design techniques for software system.
			3. To present various design patterns with application.
			4. To present various principles of software testing for applications.
			5. To present a design of test cases and implement automated testing for client server, Distributed, mobile applications.
			6. To understand advance testing techniques and tools.
	410450	**2) High Performance Computing**	1. To develop problem solving abilities using HPC.
			2. To develop time and space efficient algorithms.
			3. Understand HPC Architecture models.
			4. To develop capability for understanding and implementation of MPI.
			5. To study algorithmic examples in distributed concurrent and parallel environments
			6. To discover various optimization problem using HPC
	410451C	**3) Elective-III : Cloud Computing**	1. To be able to understand cloud computing and its basic concepts.
			2. To be able to understand various models and Architecture of Cloud Computing.
			3. Ability to asses various economical and financial implication of choosing cloud computing for an organization.
			4. To be able to understand different technological and social issues related to cloud computing.
			5. Understand various benefits and challenges of cloud computing applications.
			6. Able to analyze and understand latest trends in Cloud Technology.

	410452C	**4) Elective-IV : Mobile Applications**	1. To solve problem in projects
			2. To develop mobile applications
			3. To develop problem solving abilities using Mobile Applications.
			4. To study mobile programming technology.
			5. Able to use advanced tools & techniques of J2ME programming
			6. Able to use advanced mobile applications
	410454	**BE Project**	1. To solve problem and demonstrate the results of the project;
			2. To develop SRS, reliability testing reports, and other software engineering documents in the project report;
			3. To solve problems using multi-core, distributed, embedded, concurrent/Parallel environments
			4. To write conference paper;
			5. To demonstrate presentation, communication and team-work skills

ME I COMPUTER (SEM I TERM I)	**510101**	**Research Methodology**	1. Carry out Literature Survey
			2. Identify appropriate topics for research work in computer engineering
			3. Select and define appropriate research problem and parameters
			4. Design the use of major experimental methods for research
			5. Use appropriate tools, techniques, and processes of doing research in Computer science
			6. Demonstrate own contribution to the body of knowledge
			7. Become aware of the ethics in research, academic integrity and plagiarism
			8. Write a research report and thesis
	510102	**Bio-Inspired Optimization Algorithms**	1. Describe the natural phenomena that motivate the algorithms
			2. Apply nature-inspired algorithms to optimization
			3. Select the appropriate strategy or optimal solution based on bio-inspired algorithms
	510103	**Software Development and Version Control**	1. Select and apply the design patterns to software development.
			2. Design software for real engineering Problems.
			3. Demonstrate team work for development of software in collaborative environment.
			4. Use of open source version control tool.
	510104	**Embedded and Real Time Operating Systems**	1. Recognize and classify embedded and real-time systems
			2. Explain communication bus protocols used for embedded and real-time systems
			3. Classify and exemplify scheduling algorithms
			4. Apply software development process to a given RTOS application
			5. Design a given RTOS based application
	510105B	**ELECTIVE I:Data**	1. Apply basic, intermediate and advanced techniques to mine the data

		Mining	2. Analyze the output generated by the process of data mining
			3. Explore the hidden patterns in the data
			4. Optimize the mining process by choosing best data mining technique
ME I COMPUTER (SEM II TERM II)	**510108**	**Operations Research**	1. Identify the characteristics of different types of decision-making environments
			2. Use appropriate decision making approaches and tools
			3. Build various dynamic and adaptive models
			4. Develop critical thinking and objective analysis of decision problems
			5. Apply the OR techniques for efficacy
	510109	**System Simulation and Modeling**	1. To apply modeling to understand system behavior
			2. To design the simulation scheme for particular system
			3. To analyze the modeled and simulated systems
			4. To compare the results of simulations confined to real world application
	510110	**Machine Learning**	1. Acquire fundamental knowledge of learning theory
			2. Design and evaluate various machine learning algorithms
			3. Use machine learning methods for multivariate data analysis in various scientific fields
			4.Choose and apply appropriate Machine Learning Techniques for analysis, forecasting, categorization and clustering of the data
	510111B	**Elective II: Web Mining**	1. Transform Web Information into analytical form;
			2. Use various means to analyze and synthesize Social Networking information
			3. Use appropriate tools used in analyzing the web information
	510112	**Seminar I**	1. To use multiple thinking strategies to examine real-world issues and explore creative avenues of expression,.
			2. To acquire, articulate, create and convey intended meaning using verbal and nonverbal method of communication.
			3. To learn and integrate, through independent learning in sciences and technologies, with disciplinary specialization and the ability to integrate information across

ME II COMPUTER (SEM III TERM I)	**610101**	**Fault Tolerant Systems**	1. Analyze the system for the requirement of fault tolerance
			2. Simulate the fault tolerance algorithms
			3. Implement diagnosis and recovery of the system
			4. Assess the reliability of the system

	610102	**Information Retrieval**	1. Implement the concept of Information Retrieval
			2. Evaluate and Analyze retrieved information
			3. Generate quality information out of retrieved information
			4. Apply clustering and classification algorithms to analyze the information
	610103A	**Elective III: Cloud Security**	1. Use various services offered for cloud environment
			2. Apply computing security fundamentals confined to cloud environment
			3. Analyze the cloud system for vulnerabilities, threats and attacks
			4. Propose feasible security solution for cloud security
	610104	**Seminar II**	1. To use multiple thinking strategies to examine real-world issues and explore creative avenues of expression,.
			2. To acquire, articulate, create and convey intended meaning using verbal and nonverbal method of communication.
			3. To learn and integrate, through independent learning in sciences and technologies, with disciplinary specialization and the ability to integrate information across
	610105	**Dissertation Stage I**	1. Conduct thorough literature survey confined to the domain of choice
			2. Develop presentation skills to deliver the technical contents
			3. Furnish the report of the technical research domain
			4. Analyze the findings and work of various authors confined to the chosen domain
ME II COMPUTER (SEM IV TERM II)	**610107**	**Seminar III**	1. To use multiple thinking strategies to examine real-world issues and explore creative avenues of expression,.
			2. To acquire, articulate, create and convey intended meaning using verbal and nonverbal method of communication.
			3. To learn and integrate, through independent learning in sciences and technologies, with disciplinary specialization and the ability to integrate information across
	610108	**Dissertation Stage II**	1. Show evidence of independent investigation
			2. Critically analyze the results and their interpretation ; infer findings
			3. Report and present the original results in an orderly way and placing the open questions in the right perspective.
			4. Link techniques and results from literature as well as actual research and future research lines with the research.
			5. Appreciate practical implications and constraints of the specialist subject