Bharati Vidyapeeth's
College of Engineering, Lavale, Pune
Department of Computer Engineering

Course Outcomes (BE Computer 2015 Pattern)

Semester VII

410241 High Performance Computing	
CO1	Describe different parallel architectures, inter-connect networks, programming models
CO2	Develop an efficient parallel algorithm to solve given problem
CO3	Analyze and measure performance of modern parallel computing systems
CO4	Build the logic to parallelize the programming task

410242 Artificial Intelligence and Robotics	
CO1	Identify and apply suitable Intelligent agents for various AI applications
CO2	Design smart system using different informed search / uninformed search or heuristic approaches.
CO3	Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem.
CO4	Apply the suitable algorithms to solve AI problems

410243 Data Analytics	
CO1	Write case studies in Business Analytic and Intelligence using mathematical models
CO2	Present a survey on applications for Business Analytic and Intelligence
CO3	Provide problem solutions for multi-core or distributed, concurrent/Parallel environments

410244 Elective I	
410244(A): Digital Signal Processing	
CO1	Understand the mathematical models and representations of DT Signals and Systems
CO2	Apply different transforms like Fourier and Z-Transform from applications point of view.
CO3	Understand the design and implementation of DT systems as DT filters with filter structures and different transforms.
CO4	Demonstrate the knowledge of signals and systems for design and analysis of systems
CO5	Apply knowledge and use the signal transforms for digital processing applications
410244(B): Software Architecture and Design	
CO1	Express the analysis and design of an application
CO2	Specify functional semantics of an application
CO3	Evaluate software architectures
CO4	Select and use appropriate architectural styles and software design patterns
410244(C): Pervasive and Ubiquitous Computing	
CO1	Design and implement primitive pervasive applications
CO2	Analyze and estimate the impact of pervasive computing on future computing applications and society
CO3	Develop skill sets to propose solutions for problems related to pervasive computing system
CO4	Design a preliminary system to meet desired needs within the constraints of a particular problem space
410244(D): Data Mining and Warehousing	
CO1	Apply basic, intermediate and advanced techniques to mine the data
CO2	Analyze the output generated by the process of data mining

CO3	Explore the hidden patterns in the data
CO4	Optimize the mining process by choosing best data mining technique

410245 Elective II	
410245(A): Distributed Systems	
CO1	Able to learn and apply the concept of remote method invocation and Remote Procedure Calls
CO2	Able to analyze the mechanism of peer to peer systems and Distributed File Systems
CO3	Demonstrate an understanding of the challenges faced by current and future distributed systems
410245(B): Software Testing and Quality Assurance	
CO1	Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
CO2	Design and develop project test plan, design test cases, test data, and conduct test operations
CO3	Apply recent automation tool for various software testing for testing software
CO4	Apply different approaches of quality management, assurance, and quality standard to software
CO5	Apply and analyze effectiveness Software Quality Tools
410245(C): Operations Research	
CO1	Identify the characteristics of different types of decision-making environments
CO2	Use appropriate decision making approaches and tools
CO3	Build various dynamic and adaptive models
CO4	Develop critical thinking and objective analysis of decision problems
CO5	Apply the OR techniques for efficacy
410245(D): Mobile Communication	
CO1	Justify the Mobile Network performance parameters and design decisions.
CO2	Choose the modulation technique for setting up mobile network.
CO3	Formulate GSM/CDMA mobile network layout considering futuristic requirements which conforms to the technology.
CO4	Use the 3G/4G technology based network with bandwidth capacity planning.
CO5	Percept to the requirements of next generation mobile network and mobile applications

410246 Laboratory Practice I
The presented course is solely intended to enhance the competency by undertaking the laboratory

410247 Laboratory Practice II
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410248 Project Work Stage I	
CO1	Solve real life problems by applying knowledge.
CO2	Analyze alternative approaches, apply and use most appropriate one for feasible solution.
CO3	Write precise reports and technical documents in a nutshell.
CO4	Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work, Inter-personal relationships, conflict management and leadership quality

410249: Audit Course 5	
AC5 – I: Entrepreneurship Development	
CO1	Understand the legalities in product development
CO2	Undertake the process of IPR, Trademarks, Copyright and patenting

CO3	Understand and apply functional plans
CO4	Manage Entrepreneurial Finance
CO5	Inculcate managerial skill as an entrepreneur
AC5 – II: Botnet of Things	
CO1	Implement security as a culture and show mistakes that make applications vulnerable to attacks.
CO2	Understand various attacks like DoS, buffer overflow, web specific, database specific, web - spoofing
CO3	Demonstrate skills needed to deal with common programming errors that lead to most security problems and to learn how to develop secure applications
AC5 – III: 3D Printing	
CO1	Apply models for 3D printing
CO2	Plan the resources for 3D printing
CO3	Apply principles in 3D printing in real world
AC5 – IV: Industrial Safety and Environment Consciousness	
CO1	Formulate the plan for Safety performance
CO2	Formulate the action plan for accidents and hazards
CO3	Follow the safety and security norms in the industry
CO4	Consider critically the environmental issues of Industrialization
AC5 – V: Emotional Intelligence	
CO1	Expand your knowledge of emotional patterns in yourself and others
CO2	Discover how you can manage your emotions, and positively influence yourself and others
CO3	Build more effective relationships with people at work and at home
CO4	Positively influence and motivate colleagues, team members, managers
CO5	Increase the leadership effectiveness by creating an atmosphere that engages others
AC5 – VI : MOOC-Learn New Skill	

Semester VIII

410250: Machine Learning	
CO1	Distinguish different learning based applications
CO2	Apply different preprocessing methods to prepare training data set for machine learning.
CO3	Design and implement supervised and unsupervised machine learning algorithm.
CO4	Implement different learning models
CO5	Learn Meta classifiers and deep learning concepts

410251: Information and Cyber Security	
CO1	Gauge the security protections and limitations provided by today's technology.
CO2	Identify information security and cyber security threats.
CO3	Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.
CO4	Build appropriate security solutions against cyber-attacks

410252: Elective III	
410252(A): Advanced Digital Signal Processing	
CO1	Understand and apply different transforms for the design of DT/Digital systems
CO2	Explore the knowledge of adaptive filtering and Multi-rate DSP
CO3	Design DT systems in the field/area of adaptive filtering, spectral estimation and multi-rate DSP
CO4	Explore use of DCT and WT in speech and image processing
CO5	Develop algorithms in the field of speech , image processing and other DSP applications

410252(B): Compilers	
CO1	Design and implement a lexical analyzer and a syntax analyzer
CO2	Specify appropriate translations to generate intermediate code for the given programming language
CO3	Compare and contrast different storage management schemes
CO4	Identify sources for code optimization
410252(C): Embedded and Real Time Operating Systems	
CO1	Recognize and classify embedded and real-time systems
CO2	Explain communication bus protocols used for embedded and real-time systems
CO3	Classify and exemplify scheduling algorithms
CO4	Apply software development process to a given RTOS application
CO5	Design a given RTOS based application
410252(D): Soft Computing and Optimization Algorithms	
CO1	Apply soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy inference systems and genetic algorithms
CO2	Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified

410253 : Elective IV	
410253(A): Software Defined Networks	
CO1	Interpret the need of Software Defined Networking solutions.
CO2	Analyze different methodologies for sustainable Software Defined Networking solutions.
CO3	Select best practices for design, deploy and troubleshoot of next generation networks.
CO4	Develop programmability of network elements.
CO5	Demonstrate virtualization and SDN Controllers using OpenFlow protocol
410253(B): Human Computer Interface	
CO1	Evaluate the basics of human and computational abilities and limitations.
CO2	Inculcate basic theory, tools and techniques in HCI.
CO3	Apply the fundamental aspects of designing and evaluating interfaces.
CO4	Apply appropriate HCI techniques to design systems that are usable by people
410253(C): Cloud Computing	
CO1	To install cloud computing environments.
CO2	To develop any one type of cloud
CO3	To explore future trends of cloud computing
410253(D): Open Elective	
CO1	To inculcate the out of box thinking and to feed the inquisitive minds of the learners .

410254:Laboratory Practice III
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410255:Laboratory Practice IV
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410256:Project Work Stage II	
CO1	Show evidence of independent investigation
CO2	Critically analyze the results and their interpretation.
CO3	Report and present the original results in an orderly way and placing the open questions in the right

CO4	Link techniques and results from literature as well as actual research and future research lines with the
CO5	Appreciate practical implications and constraints of the specialist subject

410257: Audit Course 6	
AC6 – I: Business Intelligence	
CO1	Apply the concepts of Business Intelligence in real world applications
CO2	Explore and use the data warehousing wherever necessary
CO3	Design and manage practical BI systems
AC6 – II: Gamification	
CO1	To write survey on the gamification paradigms.
CO2	To write programs to solve problems using gamification and open source tools.
CO3	To solve problems for multi-core or distributed, concurrent/Parallel environments
AC6 – III: Quantum Computing	
CO1	Design efficient quantum algorithms
CO2	Apply quantum algorithms for several basic promise problems
CO3	learn the hidden subgroup problems and their role in quantum computing
AC6 – IV: Usability Engineering	
CO1	Describe the human centered design process and usability engineering process and their roles in system design and development.
CO2	Discuss usability design guidelines, their foundations, assumptions, advantages, and weaknesses.
CO3	Design a user interface based on analysis of human needs and prepare a prototype system.
CO4	Assess user interfaces using different usability engineering techniques.
CO5	Present the design decisions
AC6 – V: Conversational Interfaces	
CO1	Develop an effective interface for conversation
CO2	Explore advanced concepts in user interface
AC6– VI MOOC-Learn New Skill	