P.E.S's Modern College of Engineering
Department of Information Technology
List of Course Outcome (2015 Pattern)

SE List of Course Outcome

CO No.	SE –Sem-I-List of Course Outcome (2015 pattern)
214441: Discrete Structure	
214441.1	Formulate the problems and solve it by using different counting techniques.
214441.2	Formulate and solve the problems of Set, Relations and Functions.
214441.3	Study formal proof techniques with examples.
214441.4	Illustrate the basic terminology and model problems using Graphs and Trees.
214441.5	Understanding and implementing the concepts of groups and rings.
214441:Computer Organization & Architecture	
214442.1	Solve problems based on computer arithmetic.
214442.2	Explain processor structure & its functions.
214442.3	Obtain knowledge about micro-programming of a processor
214442.4	Understand concepts related to memory & IO organization.
214442.5	Acquire knowledge about instruction level parallelism & parallel organization of multiprocessors & multi core systems
214443 Digital Electronics and Logic Design	
214443.1	Make Use of Number System,Boolean Algebra and codes knowledge for the logic gate design
214443.2	Design Of K-map to develop various combinational logic design circuits
214443.3	Analyze sequential circuits and their use in various applications.
214443.4	Identify the digital circuits Input/Output to replace by FPGA.
214443.5	Experiment with VHDL programme technique with different modelling styles for any digital circuits.
214444 Fundamentals of Data Structures	
214444.1	Apply appropriate constructs of C language, coding standards for application development.
214444.2	Make Use of dynamic memory allocation concepts and file handling in various application developments.
214444.3	Classify basic analysis of algorithms with respect to time and space complexity.
214444.4	Select appropriate searching and/or sorting techniques in the application development
214444.5	Select and use appropriate data structures for problem solving and programming.
214445 Problem Solving and Object Oriented programming	
214445.1	1. To construct algorithm to solve problems on Modular Programming.
214445.2	2. To make use logic structures for programming problem solving.
214445.3	3. To understand OOP concepts through Abstract Data and Entities.
214445.4	4. To analyze and implement real life problems by OOP.
214446 Digital Laboratory	

214446.1	Apply of K-Map (Min) technique for implementation & design of different combinational Logic circuit using MSI & SSI chips.
214446.2	Analyse Sequential Circuit and design various problems using synchronous/asynchronous counter
214446.3	Design Sequential logic Circuit using counter and shift register
214446.4	Understand and implement design steps, main programming technique through hands on experimentation on Xilinx for any digital circuits with VHDL programming.
214447 Programming Laboratory	
214447.1	Apply appropriate constructs of C language, coding standards for application development.
214447.2	Use dynamic memory allocation concepts and file handling in various application developments.
214447.3	Perform basic analysis of algorithms with respect to time and space complexity
214447.4	Select appropriate searching and/or sorting techniques in the application development
214447.5	Select and use appropriate data structures for problem solving and programming
214448 Object Oriented programming Lab.	
214448.1	1. Break a problem into logical pieces and develop algorithms for solving simple problems.
214448.2	2. Abstract data and entities from the problem domain, build object models and design software Solutions using object-oriented principles and strategies.
214448.3	3. Discover, explore and apply tools and best practices in object-oriented programming.
214448.4	4. Develop programs that appropriately utilize key object-oriented concepts.
214449 Communication Skills	
214449.1	Develop proficiency in oral, written and listening communication.
214449.2	To find current tools associated with the communication field
214449.3	To improve formal and informal way of communication among students.
214449.4	To develop effective reading skills in various styles.

CO No.	List of Course Outcome (2015 Pattern)
214450 Computer Graphics	
214450.1	Apply mathematics and logic to develop Computer programs for elementary graphic operations
214450.2	Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics
214450.3	Demonstrate the competency to understand the concepts related to Computer Vision and Virtual reality
214450.4	Apply the logic to develop animation and gaming programs

P.E.S's Modern College of Engineering

Department of Information Technology

List of Course Outcome (2015 Pattern)

214451 Processor Architecture and Interfacing	
214451.1	To learn assembly language programming describe architecture of 80386 microprocessor
214451.2	To explain Memory management of 80386 Microprocessor
214451.3	To examine the concept of Task Switching operation in Multitasking and Interrupt Handling
214451.4	To describe the Architecture of 8051 Microcontroller
214451.5	To explain interrupt handling and implement Timer programming in 8051
214451.6	To demonstrate an interfacing of 8051 microcontroller
214452 Data Structures & Files	
214452.1	Adapt basic ability to analyze algorithms and to determine its correctness and time efficiency.
214452.2	Compare different advanced abstract data type (ADT) and data structures to demonstrate their implementations
214452.3	Develop different algorithm design techniques like greedy method (Kruskal's Algorithm).
214452.4	Choose, apply and implement different data structures to solve problems
214452.5	Find different types of File handling and its implementation
214453: FCCN	
214453.1	Understand data/signal transmission over communication media.
214453.2	Recognize usage of various modulation techniques in communication
214453.3	Analyze various spread spectrum and multiplexing techniques.
214453.4	Use concept of data communication to solve various related problems.
214453.5	Understand error correction and detection techniques.
214453.6	Acquaint with transmission media and their standards.
214454 Processor Interfacing Laboratory	
214454.1	To apply concepts related to assembly language programming
214454.2	To write and execute assembly language program to perform array addition, code conversion, block transfer, sorting and string operations
214454.3	To apply interfacing of real world input and output devices to 8051 microcontroller
214455 Data Structure and Files Laboratory	
214455.1	Apply and implement algorithm to illustrate use of linear data structures such as stack, queue
214455.2	Apply and implement algorithms to create/represent and traverse non-linear data structures such as trees, graphs etc
214455.3	Apply and implement algorithms to create and manipulate database using different file organizations
214455.4	Learn and apply the concept of hashing in database creation and manipulation
214456 Computer Graphics Laboratory	
214456.1	Apply and implement line drawing and circle drawing algorithms to draw specific shape given in the problem

214456.2	Apply and implement polygon filling algorithm for a given polygon
214456.3	Apply and implement 2-D and 3-D transformation algorithms for given input shape
214456.4	Apply and implement polygon clipping algorithm for given input polygon
214456.5	Apply and implement fractal generation algorithm for a given input
214456.6	Apply and implement animation concepts for generating simple animation without using any animation tool

Dr.Mrs. S. D. Deshpande
HOD IT

PES' Modern College of Engineering
IT Department
Pune-411005

P.E.S's Modern College of Engineering

Department of Information Technology

List of Course Outcome (2015 Pattern)

TE List of Course Outcome

CO No.	Course Outcome (2015 pattern)
314441 Theory of Computation	
314441.1	1. To build finite automata with output to solve computing problems
314441.2	2. To construct regular expression for the given language and vice versa.
314441.3	3. To classify different types of grammar for syntax verification.
314441.4	4. To test the concept of Push down automata, Turing Machine for formal language.
314441.5	5. To understand the Computational Time Complexity of problems.
314442 Database Management Systems	
314442.1	Define the basic functions of DBMS & RDBMS & Analyze ER model & relational model
314442.2	Design database in appropriate normal form for given problem.
314442.3	Formulate queries using relational algebra & SQL.
314442.4	Illustrate the basic concepts of transaction processing & concurrency control
314442.5	Write program using PL/SQL
314442.6	Classify different database architecture.
314442.7	Understand how analytics & big data affect various functions.
314443 Software Engineering & Project Management	
314443 .1	To identify unique features of various software application domains and classify software applications.
314443. 2	To choose and apply appropriate lifecycle model of software development.
314443 .3	To describe principles of agile development, discuss the SCRUM process and distinguish agile process model from other process models.
314443. 4	To analyse software requirements by applying various modelling techniques.
314443. 5	To list and classify CASE tools and discuss recent trends and research in software engineering.
314443. 6	To understand IT project planning and project management through life cycle of the project and future trends in IT Project Management.
314444 Operating System	
314444.1	Fundamental understanding of the role of Operating Systems.
314444.2	To understand the concept of a process and thread
314444.3	To apply the cons of process/thread scheduling
314444.4	To apply the concept of process synchronization, mutual exclusion and the deadlock
314444.5	To realize the concept of I/O management and File system.
314444.6	To understand the various memory management techniques
314445 Human-Computer Interaction	
314445.1	To explain importance of HCI study and principles of user-centered design (UCD) approach.
314445.2	To develop understanding of human factors in HCI design.
314445.3	To develop understanding of models, paradigms and context of interactions.

314445.4	To design effective user-interfaces following a structured and organized UCD process.
314445.5	To evaluate usability of a user-interface design.
314445.6	To apply cognitive models for predicting human-computer-interactions.
314446 Software Laboratory-I	
314446.1	To install and configure database systems
314446.2	To analyze database models & entity relationship models
314446.3	To design and implement a database schema for a given problem-domain
314446.4	To understand the relational and document type database systems
314446.5	To populate and query a database using SQL DML/DDL commands.
314446.6	To populate and query a database using MongoDB commands.
314447 Software Laboratory-II	
314447.1	To understand the basics of Linux commands and program the shell of Linux.
314447.2	To develop various system programs for the functioning of operating system.
314447.3	To implement basic building blocks like processes, threads under the Linux.
314447.4	To develop various system programs for the functioning of OS concepts in user space like concurrency control and file handling in Linux.
314447.5	To design and implement Linux Kernel Source Code.
314447.6	To develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any linux kernel.
314448 Software Laboratory-III	
314448.1	To identify the needs of users through requirement gathering.
314448.2	To apply the concepts of Software Engineering process models for project development.
314448.3	To apply the concepts of HCI for user-friendly project development.
314448.4	To deploy website on live web server and access through URL.
314448.5	To understand, explore and apply various web technologies.
314448.6	To develop team building for efficient project development.

CO No.	Course Outcome (2015 pattern)
314450 Computer Network Technology	
314450.1	To know responsibilities, services offered and protocol used at each layer of network.
314450.2	To understand different addressing techniques used in network.
314450.3	To illustrate the standards and protocols learned, for application development.
314450.4	To know the different wireless technologies and IEEE standards.
314450.5	To understand and explore recent trends in network domain.

314451 Systems Programming	
314451.1	To learn basic principle of system software.
314451.2	To design and implement Assemblers, Macro Processor and Loaders.
314451.3	Demonstrate LEX tool for generation of Lexical Analyzer.
314451.4	Demonstrate YACC tool for generation of Syntax Analyzer.
314451.5	To construct output for all the phases of compiler.
314451.6	To explain Semantic Analysis, Code optimization in the compilation process.
314452 Design and Analysis of Algorithms	
314452.1	To calculate computational complexity using asymptotic notations for various algorithms.
314452.2	To Apply Divide and Conquer as well as Greedy approach to design algorithms.
314452.3	To practice principle of optimality.
314452.4	To illustrate different problems using Backtracking.
314452.5	To compare different methods of branch and bound strategy.
314452.6	To explore the concept of P, NP. NP- complete, NP-hard and parallel algorithms.
314453 Cloud Computing	
314453.1	To understand the need of Cloud based solutions.
314453.2	To understand Security Mechanisms and issues in various Cloud Applications.
314453.3	To explore effective techniques to program Cloud Systems.
314453.4	To understand current challenges and trade-offs in Cloud Computing.
314453.5	To find challenges in cloud computing and delve into it to effective solutions.
314453.6	To understand emerging trends in cloud computing.
314454 Data Science & Big Data Analytics	
314454.1	To understand Big Data primitives.
314454.2	To learn and apply different mathematical models for Big Data.
314454.3	To demonstrate their Big Data learning skills by developing industry or research applications.
314454.4	To analyze each learning model come from a different algorithmic approach and it will perform differently under different datasets.
314454.5	To understand needs challenges and techniques for big data visualization.
314454.6	To learn different programming platforms for big data analytics.
314455 Software Laboratory-IV	
314455.1	To implement small size network and its use of various networking commands
314455.2	To understand and use various networking and simulations tools
314455.3	To configure various client/server environments to use application layer protocols
314455.4	To understand the protocol design at various layers.
314455.5	To explore use of protocols in various wired and wireless applications.
314455.6	To develop applications on emerging trends.
314456 Software Laboratory-V	
314456.1	To design and implement two pass assembler for hypothetical machine instructions
314456.2	To design and implement different phases of compiler
314456.3	To use the compile generation tools such as “Lex" and "YACC”.

314456.4	To apply algorithmic strategies for solving various problems.
314456.5	To compare various algorithmic strategies.
314456.6	To analyze the solution using recurrence relation.

314457 Software Laboratory-VI

314457.1	To apply Big data primitives and fundamentals for application development.
314457.2	To explore different Big data processing techniques with use cases.
314457.3	To apply the Analytical concept of Big data using R/Python.
314457.4	To visualize the Big Data using Tableau.
314457.5	To design algorithms and techniques for Big data analytics.
314457.6	To design Big data analytic application for emerging trends.
314458 Project Based Seminar	
314458.1	To Gather, organize, summarize and interpret technical literature with the purpose of formulating a project proposal.
314458.2	To write a technical report summarizing state-of-the-art on an identified topic.
314458.3	Present the study using graphics and multimedia presentations.
314458.4	Define intended future work based on the technical review.
314458.5	To explore and enhance the use of various presentation tools and techniques.
314458.6	To understand scientific approach for literature survey and paper writing.

Dr.Mrs. S. D. Deshpande
HOD IT

PES' Modern College of Engineering IT Department Pune-411005

BE List of Course Outcome

CO No.	Course Outcome (2015 Pattern)
414453:ICS	
414453.1	Understand the essentials of the Information Security.
414453.2	Demonstrate the role of principle concepts with major issues for modeling a secure system.

414453.3	To develop computer forensic awareness.
414453.4	Make use of Cyber Security with Modern tools and Methods.
414454:MLA	
414454.1	Model the learning primitives.
414454.2	Build the learning model.
414454.3	Tackle real world problems in the domain of Data Mining and Big Data Analytics, Information Retrieval, Computer vision, Linguistics and Bioinformatics.
414455 : SDM	
C414455.1	Understand object oriented methodologies, basics of Unified Modeling Language
C414455.2	Understand analysis process, use case modeling, domain/class modeling
C414455.3	Understand interaction and behavior modeling.
C414455.4	Understand design process and business, access and view layer class design
C414455.5	Get started on study of GRASP principles and GoF design patterns.
C414455.6	Get started on study of architectural design principles and guidelines in the various type of application development.
414456 A Wireless Communications	
C 414456A:1	Understand the basic concepts of radio signal propagation
C 414456A:2	Understand the basic concepts of Cellular System and the design requirements
C 414456A:3	Compare various mobile radio propagation models in order to improve performance with respect to diversity
C 414456A:4	Examine multiple access techniques
C 414456A:5	Understand the design consideration and architecture of Wireless Systems
C 414456A:6	Understanding of the emerging trends in Wireless communication.
414456 B NLP	
C414456B.1	Understand automatic processing of human languages using computers.
C414456B.2	Understand various applications of natural language processing
414456 E BAI	
C414456E.1	Comprehend the Information Systems and development approaches of Intelligent Systems.
C414456E.2	Evaluate and rethink business processes using information systems
C414456E.3	Propose the Framework for business intelligence.
C414456E.4	Get acquainted with the Theories, techniques, and considerations for capturing organizational intelligence.
C414456E.5	Align business intelligence with business strategy.
C414456E.6	Apply the techniques for implementing business intelligence systems.
414457C:STQA	
414457C .1	Test the software by applying testing techniques to deliver a product free from bugs.
414457C .2	Investigate the scenario and to select the proper testing technique.

414457C .3	Explore the test automation concepts and tools and estimation of cost, schedule based on standard metrics.
414457C .4	Understand how to detect, classify, prevent and remove defects.
414457C .5	Choose appropriate quality assurance models and develop quality.
414457C .6	Ability to conduct formal inspections, record and evaluate results of inspections.
C414457B: SC	
414457 B.1	Understand various soft computing techniques and their role in problem solving.
414457 B.2	Conceptualize various real life problems to be solved through basic of Neural Network soft computing techniques.
414457 B.3	Apply fuzzy logic and reasoning to handle uncertainty and solve engineeringproblems.
414457 B.4	Analyze various evolutionary techniques of soft computing in order to solve problems effectively and efficiently.
414457 B.5	Gain knowledge of Advances in soft computingwhich opens up a whole new career option.
414458: CL-VII	
414458.1	The students will be able to implement secured systems.
414458.2	The students will be able to build learning software in various domains.
414459: CL-VIII	
414459.1	Draw, discuss different UML 2.0 diagrams, their concepts, notation, advanced notation, forward and reverse engineering aspects.
414459.2	Identify different software artifacts used to develop analysis and design model from requirements.
414459.3	Develop use case model.
414459.4	Develop, implement analysis model and design model.
414459.5	Develop, implement Interaction and behavior Model.
414459.6	Implement an appropriate design pattern to solve a design problem.
C414460: Project Work	
414460.1	To show preparedness to study independently in chosen domain of Information Technology and programming languages and apply their acquired knowledge to variety of real time problem scenarios.
414460.2	To function effectively as a team to accomplish a desired goal.
414460.3	An understanding of professional, ethical, legal, security and social issues and responsibilities related to Information Technology Project.

CO No.	Course Outcome (2015 Pattern)
414462:DS	
414462.1	To explain the principles and desired properties of distributed systems based on different application areas.
414462.2	To apply the basic theoretic concepts and algorithms of distributed systems in problem solving.

414462.3	To analyze the inherent difficulties that arises due to distributed-ness of computing resources.
414462.4	To identify the challenges in developing multimedia system applications.
414462.5	To classify distributed files system and distributed multimedia systems.
414462.6	To discuss the issues that arises while providing security in distributed systems.
414463:UC	
414463.1	Demonstrate the knowledge of design of Ubicomp and its applications.
414463.2	Explain smart devices and services used Ubicomp.
414463.3	Describe the significance of actuators and controllers in real time application design.
414463.4	Use the concept of HCI to understand the design of automation applications.
414463.5	Classify Ubicomp privacy and explain the challenges associated with Ubicomp privacy.
414463.6	Get the knowledge of ubiquitous and service oriented networks along with Ubicomp management.
414464A:IOT	
414464A.1	Explain what is Internet of Things.
414464A.2	Explain architecture and design of IoT.
414464A.3	Describe the objects connectd in IoT.
414464A.4	Understand the Underlying Technologies.
414464A.5	Understant the pl;atforms in IoT.
414464A.6	Understand the cloud interface to IoT.
414464D:IWP(Th)	
414464D.1	Illustrate static website using basic tools.
414464D.2	Develop client side programming skills.
414464D.3	Develop server side programming skills.
414464D.4	Illustrate web services and handle content management tools.
414464D.5	Develop application website for mobile using mobile web development tools
414464D.6	Explain aspects of web security and cyber ethics.
414465A:Rural Technology	
C414464A.1	Understand rural development model
C414464A .2	Learn different measures in rural development and its impact on overall economy.
C414464A .3	Understand and learn importance of technologies in rural
C414464A .4	Understand and learn importance of developing communities in rural.
C414464A .5	Understand challenges and opportunities in rural development.
414466:CL-IX	
414466.1	To develop a distributed application through the concept of client-server communication.
414466.2	To apply principles of state-of-the-art distributed systems in practical applications.

414466.3	To build an application programs on distributed systems.
414467:CL-X	
414467.1	Set up the Android environment and explain the Evolution of cellular networks.
414467.2	Develop the User Interfaces using pre-built Android UI components.
414467.3	Create applications for performing CURD SQLite database operations using Android.
414467.4	Create the smart android applications using the data captured through sensors.
414467.5	Implement the authentication protocols between two mobile devices for providing. Security.
414467.6	Analyze the data collected through android sensors using any machine learning algorithm.
414464D:IWP(PR)	
414464D.1	1. Demonstrate Internet web technologies using web developments tools
414464A:IOT PR	
414464A.1	To understand IoT platforms such as Raspberry-Pi/Beagle Board/Arduino.
414464A.2	To understand operating systems for platfrom such as Raspberry-Pi/Beagle Board/Arduino.
414464A.3	Show communication with objects suing IoT platforms such as Raspberry-Pi/Beagle Board/Arduino.
414464A.4	Make use of interface cloud envirnment for IoT application.
414464A.5	Experiment with IoT related protocols such as MQTT / CoAP etc.
414464A.6	To bulid the web interface for IoT.

Dr.Mrs. S. D. Deshpande
HOD IT

PES' Modern College of Engineering IT Department Pune-411005