



LOYOLA INSTITUTE OF TECHNOLOGY

Palanchur, Chennai-600123

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai
(An ISO Certified Institution)

Department of Computer Science and Engineering

Regulation 2017

Course Outcomes (COs)

ODD SEM

II YEAR (5 Theory + 4 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	DISCRETE MATHEMATICS	CO1	Have knowledge of the concepts needed to test the logic of a program.
		CO2	Have an understanding in identifying structures on many levels.
		CO3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
		CO4	Be aware of the counting principles.
		CO5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
		CO6	Apply the knowledge of argumental discrete mathematical problems.
2	DIGITAL PRINCIPLES AND SYSTEM DESIGN	CO1	Simplify Boolean functions using KMap
		CO2	Design and Analyze Combinational and Sequential Circuits
		CO3	Implement designs using Programmable Logic Devices
		CO4	Write HDL code for combinational and Sequential Circuits
		CO5	Implement Hazards for asynchronous sequential logic.
		CO6	Apply memory and sequential programmable device.
3	DATA STRUCTURES	CO1	Implement abstract data types for linear data structures.
		CO2	Apply the different linear data structures to problem solutions.
		CO3	Critically analyze the various sorting algorithms.

		CO4	Implement graphs and trees for data structures
		CO5	Implement Extensible hashing techniques
		CO6	Apply searching sorting techniques
4	OBJECT ORIENTED PROGRAMMING	CO1	Develop Java programs using OOP principles
		CO2	Develop Java programs with the concepts inheritance and interfaces
		CO3	Build Java applications using exceptions and I/O streams
		CO4	Develop Java applications with threads and generics classes
		CO5	Develop interactive Java programs using swings
		CO6	Develop 2D techniques for event driven programming
5	COMMUNICATION ENGINEERING	CO1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world
		CO2	Apply analog and digital communication techniques..
		CO3	Use data and pulse communication techniques.
		CO4	Analyze Source and Error control coding.
		CO5	Explain the basic principles in the generation of spread spectrum signals.
		CO6	Explain the methods of multiple access in communication systems.
6	DATA STRUCTURES LABORATORY	CO1	Write functions to implement linear and non-linear data structure operations
		CO2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
		CO3	Appropriately use the linear / non-linear data structure operations for a given problem
		CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
		CO5	Apply Trees and Graph for given problem
		CO6	Apply Searching and sorting for given problem
7	OBJECT ORIENTED PROGRAMMING LABORATORY	CO1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
		CO2	Develop and implement Java programs with arraylist, exception handling and multithreading .
		CO3	Design applications using file processing, generic programming and event handling.

		CO4	Design a event-driven programming
		CO5	Develop a software skills using java programming for real-world applications.
		CO6	Develop mini project for application
8	DIGITAL SYSTEMS LABORATORY	CO1	Implement simplified combinational circuits using basic logic gates
		CO2	Design digital circuits using simplified Boole functions
		CO3	Implement combinational circuits using MSI devices
		CO4	Implement sequential circuits like registers and counters
		CO5	Implement synchronous and asynchronous Sequential logic
		CO6	Simulate combinational and sequential circuits using HDL
9	INTERPERSONAL SKILLS/LISTENING&SPEAKING	CO1	Listen and respond appropriately.
		CO2	Participate in group discussions
		CO3	Make effective presentations
		CO4	Participate confidently and appropriately in conversations both formal and informal
		CO5	
		CO6	



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EVEN SEM

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1	PROBABILITY AND QUEUING THEORY	CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon
		CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications
		CO3	Apply the concept of random processes in engineering disciplines.
		CO4	Acquire skills in analyzing queueing models.
		CO5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner
		CO6	
2	COMPUTER ARCHITECTURE	CO1	Understand the basics structure of computers, operations and instructions.
		CO2	Design arithmetic and logic unit.
		CO3	Understand pipelined execution and design control unit.
		CO4	Understand parallel processing architectures
		CO5	Understand the various memory systems and I/O communication.
		CO6	Understand the memory hierarchies, cache memories and virtual memories.
	DATABASE MANAGEMENT SYSTEMS	CO1	Classify the modern and futuristic database applications based on size and complexity
		CO2	Design SQL and relational database design.

3		CO3	Map ER model to Relational model to perform database design effectively
		CO4	Write queries using normalization criteria and optimize queries
		CO5	Compare and contrast various indexing strategies in different database systems
		CO6	Appraise how advanced databases differ from traditional databases.
4	DESIGN AND ANALYSIS OF ALGORITHMS	CO1	Design algorithms for various computing problems.
		CO2	Analyze the time and space complexity of algorithms.
		CO3	Analyze dynamic programming and Greedy Technique for Prim's algorithm and Kruskal's Algorithm
		CO4	Apply graph techniques with memory function
		CO5	Critically analyze the different algorithm design techniques for a given problem.
		CO6	Modify existing algorithms to improve efficiency.
5	OPERATING SYSTEMS	CO1	Analyze various scheduling algorithms.
		CO2	Understand deadlock, prevention and avoidance algorithms
		CO3	Compare and contrast various memory management schemes.
		CO4	Understand the functionality of file systems.
		CO5	Perform administrative tasks on Linux Servers.
		CO6	Compare iOS and Android Operating Systems.
6	SOFTWARE ENGINEERING	CO1	Identify the key activities in managing a software project
		CO2	Compare different process models.
		CO3	Concepts of requirements engineering and Analysis Modeling.
		CO4	Apply systematic procedure for software design and deployment.
		CO5	Compare and contrast the various testing and maintenance.
		CO6	Manage project schedule, estimate project cost and effort required.
7	DATABASE MANAGEMENT SYSTEMS LABORATORY	CO1	Use typical data definitions and manipulation commands..
		CO2	Design applications to test Nested and Join Queries
		CO3	Implement simple applications that use Views
		CO4	Implement applications that require a Front-end Tool
		CO5	Develop use of nested and join queries
		CO6	Critically analyze the use of Tables, Views,

			Functions and Procedures
8	OPERATING SYSTEMS LABORATORY	CO1	Make effective presentations
		CO2	Participate confidently in Group Discussions.
		CO3	Attend job interviews and be successful in them.
		CO4	Develop adequate Soft Skills required for the workplace
		CO5	Able to Take international examination such as IELTS and TOEFL
		CO6	Able to fine-tune their linguistic skills (LSRW) with the help of technology to communicate globally.
9	ADVANCED READING AND WRITING	CO1	Write different types of essays.
		CO2	Write winning job applications.
		CO3	Read and evaluate texts critically.
		CO4	Display critical thinking in various professional contexts
		CO5	Exhibit ethical principles in engineering practices
		CO6	Interpret the findings with appropriate technological / research citation



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III YEAR (6 Theory + 3 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Algebra and Number Theory	CO1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
		CO2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
		CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
		CO4	Demonstrate their mastery by solving non-trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text.
		CO5	Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
		CO6	Associate the knowledge of integrated approach to Number theory and abstract algebra.
2	Computer Networks	CO1	Understand the basic layers and its functions in computer networks.
		CO2	Evaluate the performance of a network.
		CO3	Understand the basics of how data flows from one node to another.
		CO4	Analyze and design routing algorithms
		CO5	Design protocols for various functions in the network.
		CO6	Design protocols for various functions in the network. Understand the working of various application layer protocols
3	Microprocessors and	CO1	Understand and execute programs based on

	Microcontrollers		8086 microprocessor
		CO2	Design Memory Interfacing circuits.
		CO3	Design and interface I/O circuits
		CO4	Design and implement 8051 microcontroller based systems.
		CO5	Design microprocessors with supporting chips
		CO6	Design interfacing microcontroller ARM processor
4	Theory of Computation	CO1	Construct automata, regular expression for any pattern.
		CO2	Write Context free grammar for any construct.
		CO3	Design Turing machines for any language.
		CO4	Propose computation solutions using Turing machines.
		CO5	Derive whether a problem is decidable or not.
		CO6	Interpret NP class problems
5	Object Oriented Analysis and Design	CO1	Express software design with UML diagrams
		CO2	Design software applications using OO concepts.
		CO3	Identify various scenarios based on software requirements
		CO4	Transform UML based software design into pattern based design using design patterns
		CO5	Understand the various testing methodologies for OO software
		CO6	Develop Test case and Test plans
6	TELEHEALTH TECHNOLOGY	CO1	Apply multimedia technologies in telemedicine.
		CO2	Explain Protocols behind encryption techniques for secure transmission of data.
		CO3	Apply telehealth in healthcare.
		CO4	
		CO5	
		CO6	
7	Microprocessors and Microcontrollers Laboratory	CO1	Develop ALP for arithmetic and logical operations in 8086
		CO2	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
		CO3	Interface different I/Os with processor
		CO4	Generate waveforms using Microprocessors
		CO5	Execute Programs in 8051
		CO6	Explain the difference between simulator and Emulator
8	Object Oriented Analysis and	CO1	Perform OO analysis and design for a given

	Design Laboratory		problem specification
		CO2	Identify and map basic software requirements in UML mapping
		CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
		CO4	Test the compliance of the software with the SRS.
		CO5	Draw relevant State Chart and Activity Diagrams
		CO6	Improve the reusability and maintainability of the software system
9	Networks Laboratory	CO1	Implement various protocols using TCP and UDP
		CO2	Compare the performance of different transport layer protocols.
		CO3	Use simulation tools to analyze the performance of various network protocols.
		CO4	Analyze various routing algorithms.
		CO5	Implement error correction codes.
		CO6	Simulation of error correction code



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Course Outcomes (COs)

EVEN SEM

III YEAR (6 Theory + 3 Labs + 1 Mini Projects)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Internet Programming	CO1	Construct a basic website using HTML and Cascading Style Sheets.
		CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms
		CO3	Develop server side programs using Servlets and JSP.
		CO4	Construct simple web pages in PHP and to represent data in XML format.
		CO5	Use AJAX and web services to develop interactive web applications
		CO6	Design application with SOAP.
2	Artificial Intelligence	CO1	Use appropriate search algorithms for any AI problem
		CO2	Represent a problem using first order and predicate logic
		CO3	Provide the apt agent strategy to solve a given problem
		CO4	Design software agents to solve a problem
		CO5	Design Information Retrieval and Extraction for applications.
		CO6	Design applications for NLP that use Artificial Intelligence.
3	Mobile Computing	CO1	Explain the basics of mobile telecommunication systems
		CO2	Illustrate the generations of telecommunication systems in wireless networks
		CO3	Determine the network layer protocols and Ad-Hoc networks
		CO4	Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network

		CO5	Explain the functionality of Transport and Application layers
		CO6	Develop a mobile application using android/blackberry/ios/Windows SDK
4	Compiler Design	CO1	Understand the different phases of compiler.
		CO2	Design a lexical analyzer for a sample language.
		CO3	Apply different parsing algorithms to develop the parsers for a given grammar
		CO4	Understand syntax-directed translation and run-time environment.
		CO5	Learn to implement code optimization techniques and a simple code generator.
		CO6	Design and implement a scanner and a parser using LEX and YACC tools.
5	Distributed Systems	CO1	Elucidate the foundations and issues of distributed systems
		CO2	Understand the various synchronization issues and global state for distributed systems.
		CO3	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
		CO4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
		CO5	Describe the features of peer-to-peer
		CO6	Describe the distributed shared memory systems
6	Professional Elective I Software Testing	CO1	Design test cases suitable for a software development for different domains.
		CO2	Identify suitable tests to be carried out.
		CO3	Prepare test planning based on the document.
		CO4	Document test plans and test cases designed
		CO5	Use automatic testing tools.
		CO6	Develop and validate a test plan
7	Internet Programming Laboratory	CO1	Construct Web pages using HTML/XML and style sheets.
		CO2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
		CO3	Develop dynamic web pages using server side scripting
		CO4	Develop to write Client Server applications
		CO5	Use PHP programming to develop web applications.
		CO6	Construct web applications using AJAX and web services.
8	Mobile Application Development Laboratory	CO1	Develop mobile applications using GUI and Layouts.
		CO2	Develop mobile applications using Event Listener.

		CO3	Develop an application that uses Multi-threading
		CO4	Develop mobile applications using Databases.
		CO5	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multithreading and GPS.
		CO6	Analyze and discover own mobile app for simple needs.
9	Mini Project	CO1	Choose problems with technical importance and societal contribution
		CO2	Identify and survey the relevant literature for getting exposed to related solutions
		CO3	Build project plans with feasible requirements
		CO4	Analyse, design and develop adaptable and reusable solutions
		CO5	Implement and test solutions to trace against the user requirements
		CO6	Deploy the solutions for better manageability and provide scope for improvability
10	Professional Communication	CO1	Make effective presentations
		CO2	Participate confidently in Group Discussions.
		CO3	Attend job interviews and be successful in them.
		CO4	Develop adequate Soft Skills required for the workplace
		CO5	To display the body language in a very pleasant manner and react to even tough situations with ease.
		CO6	To perform intelligently during job interviews and be successful.



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ODD SEM

IV YEAR (6 Theory + 2 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Principles of Management	CO1	Able to know the function and principle of management
		CO2	Clear understanding of planning.
		CO3	Acquire skills in the concept of staffing.
		CO4	Acquire skills in motivational techniques.
		CO5	Acquire skills in the concept of controlling.
		CO6	Able to know the principle of reporting.
2	Cryptography and Network Security	CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
		CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
		CO3	Apply the different cryptographic operations of public key cryptography
		CO4	Apply the various Authentication schemes to simulate different applications
		CO5	Apply the various Integrity schemes to simulate different applications
		CO6	Understand various Security practices and System security standards
3	Cloud Computing	CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
		CO2	Learn the key and enabling technologies that help in the development of cloud.
		CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
		CO4	Explain the core issues of cloud computing such as resource management and security.
		CO5	Be able to install and use current cloud technologies.
		CO6	Evaluate and choose the appropriate technologies,

			algorithms and approaches for implementation and use of cloud.
4	Open Elective II Hospital Management	CO1	Explain the principles of Hospital administration.
		CO2	Identify the importance of Human resource management.
		CO3	List various marketing research techniques.
		CO4	Identify Information management systems and its uses.
		CO5	Learn the recruitment and Training in Hospital management
		CO6	Understand safety procedures followed in hospitals
5	Professional Elective II HCI	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	Design the application for Mobile 2.0 and Mobile design
		CO6	Develop meaningful user interface
6	Professional Elective III CGM	CO1	Design two dimensional graphics.
		CO2	Apply two dimensional transformations.
		CO3	Design three dimensional graphics.
		CO4	Apply three dimensional transformations
		CO5	Apply clipping techniques to graphics.
		CO6	Design Basic 3d Scenes using Blender
7	Cloud Computing Laboratory	CO1	Configure various virtualization tools such as Virtual Box, VMware workstation.
		CO2	Design and deploy a web application in a PaaS environment.
		CO3	Learn how to simulate a cloud environment to implement new schedulers
		CO4	Install and use a generic cloud environment that can be used as a private cloud.
		CO5	Manipulate large data sets in a parallel environment.
		CO6	Apply Hadoop single node cluster and run simple applications
8	Security Laboratory	CO1	Develop code for classical Encryption Techniques to solve the problems
		CO2	Build cryptosystems by applying symmetric and public key encryption algorithms.
		CO3	Construct code for authentication algorithms
		CO4	Develop a signature scheme using Digital signature standard.
		CO5	Demonstrate the network security system using open source tools
		CO6	Develop code for classical Encryption Techniques to solve the problems.



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1	Professional Elective IV PEE	CO1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
		CO2	Explain the role of ethics to the engineering field
		CO3	Describe how engineering is applied in association with ethics based on engineering experimentation
		CO4	Explain the engineering ethics-based safety, responsibilities and rights
		CO5	Discuss the global issues of professional ethics in engineering
		CO6	Experiment the professional ethics in engineering-based product development
2	Professional Elective V IR	CO1	Use an open source search engine framework and explore its capabilities
		CO2	Apply appropriate method of classification or clustering.
		CO3	Design and implement innovative features in a search engine
		CO4	Design and implement a recommender system.
		CO5	Enable the development in sharing information about family and friends
		CO6	Develop flair for any kind of writing with rich vocabulary and proper syntax.
3	Project Work	CO1	Identify technically and economically feasible problems of social relevance
		CO2	Plan and build the project team with assigned responsibilities
		CO3	Identify and survey the relevant literature for getting exposed to related solutions
		CO4	Analyse, design and develop adaptable and reusable solutions of minimal complexity by using modern tools
		CO5	Compile all the work performed and generate the

			report for the project
		CO6	Deploy and support the solutions for better manageability of the solutions and provide scope for improvability