

## Anantrao Thopte College , Bhor Dist. Pune

### Department of Computer Science

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#### B.Sc. (Computer Science)

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#### Programme Outcome

- Develop ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
- To prepare students to undertake careers involving problem solving using computer science and technologies.
- Develop ability to pursue advanced studies and research in computer science.
- To produce entrepreneurs who can innovate and develop software product.

#### F.Y.B.Sc. (Computer Science) Semester-I

#### Course Title:-CS-101 Problem solving using computer and C programming

##### Course Outcomes:-

- Explore algorithmic approaches to problem solving.
- Ability to analyze a problem and devise an algorithm to solve it.
- Able to formulate algorithms, pseudo codes and flowcharts for arithmetic and logical problems.
- Ability to implement algorithms in the 'C' language.
- Develop modular programs using control structures and arrays in 'C'.

#### Course Title :CS-102 Database Management Systems

##### Course Outcomes

- Understand fundamental concepts of database.
- Understand user requirements and frame it in data model.
- Ability in creations, manipulation and querying of data in databases.
- Ability to solve real world problems using appropriate set, function, and relational models.
- Ability to design E-R Model for given requirements and convert the same into database tables.

#### Course Title:- CS-103 Practical Course based on CS-101 and CS-102 (C and DBMS)

##### Course Outcome:-

- Able to devise pseudo code and flowchart for computational problems.
- Understand how to write, debug and execute simple programs in C.
- Able to create database tables in Postgres SQL.
- Able to write and execute simple and nested queries.

### **Course Title: - ELC-111: Semiconductor Devices and Basic Electronic Systems**

#### **Course Outcome:**

- To study various types of semiconductor devices, elementary electronic circuits and systems.
- To bridge the gap between Theoretical and practical knowledge.

### **Course Title: - ELC-112: Principles of Digital Electronics**

#### **Course Outcome:**

- To get familiar with concepts of digital electronics.
- To study arithmetic circuits, combinational circuits and sequential circuits.

### **Course Title: - ELC-113 Electronics Practical Paper – I**

#### **Course Outcome:**

- To use basic concepts for building various applications in electronics.
- To understand design procedures of different electronic circuits as per requirement.
- To build experimental setup and test the circuits.
- To develop skills of analyzing test results of given experiments.

### **Course Title: MTC 111 Matrix Algebra**

#### **Course Outcome:**

- Perform basic Matrix operation.
- Define special matrices: diagonal, triangular, and symmetric.
- Basics of solving systems of linear equations.
- Understand determinants and their properties.
- Logic behind writing programs using computer language.
- Factorization of any square matrix in simpler LU-form.

### **Course Title: MTC 112 Discrete Mathematics**

#### **Course Outcome:**

- Understanding the concepts of discrete mathematics.
- Learning applications of discrete structures in Computer Science.
- Express a logic sentence in terms of predicates, quantifiers, and logical connectives.
- Apply the operations of sets and use Venn diagrams to solve applied problems; solve problems using the principle of inclusion-exclusion.
- Demonstrate different traversal methods for trees and graphs.
- Model problems in Computer Science using graphs and trees.

### **Course Title: MTC 113 Mathematics Practical**

#### **Course Outcome:**

- Students will be able to compute matrix calculation using Maxima software.
- Use appropriate modern technology to explore calculus concepts.
- Solve applied problems using matrices.
- Solve systems of linear equations by use of the matrix.
- Students will be able to formulate problems in the language of sets and perform set operations, and will be able apply the Fundamental Principle of Counting, Multiplication Principle.

### **Course Title: CSST 111 Descriptive statistics**

#### **Course Outcome:**

- The main purpose of descriptive statistics is to provide a brief summary of the samples and the measures done on a particular study.
- To provide basic information about variables in a dataset.

### **Course Title: CSST 112 Mathematical Statistics**

#### **Course Outcome:**

- It will help students develop skills in thinking and analyzing problems from a probabilistic and statistical point of view.
- It will provide difference between Discrete and continuous distributions.

### **Course Title:- CSST 113 Statistics Practical Paper I**

#### **Course Outcome:**

- To Study free statistical software's and use them for data analysis in project
- To use of Statistical tools in Ms-Excel

## **F.Y.B.Sc(Computer Science) Semester -II**

### **Course Title:-CS 201 Advanced C programming**

#### **Course Outcomes:-**

- Develop advanced concepts of programming using C.
- Develop modular programs using control structures, pointers, arrays, strings and structures.
- Design and develop solutions to real world problems using C.
- Able to develop structured programming approach.

### **Course Title : CS-202 Relational database Management Systems**

#### **Course Outcome**

- Able to acquire knowledge of data security and its importance.
- Design E-R Model for given requirements and convert the same into database tables.
- Able to use database techniques such as SQL & PL/SQL.
- Understand and able to implement concept of transactions.
- Use advanced database Programming concepts.

### **Course Title:- CS-203 Practical Course based on CS-201 and CS-202(Advanced C and RDBMS)**

#### **Course Outcome:-**

- Write debug and execute programs using advanced features in C.
- To perform advanced database operations.

### **Course Title : - ELC-121 Instrumentation System**

#### **Course Outcome:**

- To study various kind of Instrument of different Instrumentation System
- To control the parameter in process or a particular system.
- To study smart sensors for smart Electronics Applications.

### **Course Title : - ELC-122 Basics of Computer Organization**

#### **Course Outcome:**

- To study and design different counters.
- To study basics of computer system.
- To study Memory Organization.

## **Course Title: - ELC- 123 Electronics Practical Paper – II**

### **Course Outcome:**

- To use basic concepts for building various applications in electronics.
- To understand design procedures of different electronic circuits as per requirement.
- To build experimental setup and test the circuits.
- To develop skills of analyzing test results of given experiments.

## **Course Title:- MTC 121 Linear Algebra**

### **Course Outcome:**

- Solve systems of linear equations using various methods including Gaussian and Gauss Jordan elimination and inverse matrices.
- Perform matrix algebra, invertibility, and the transpose and understand vector algebra in  $\mathbb{R}^n$ .
- Compute linear transformations, kernel and range, and inverse linear transformations, and find matrices of general linear transformations.
- Compute inner products on a real vector space and compute angle and orthogonality in inner product spaces.
- Prove basic results in linear algebra using appropriate proof-writing techniques such as linear independence of vectors; properties of subspaces; linearity, injectivity and surjectivity of functions; and properties of eigenvectors and eigenvalues.

## **Course Title:- MTC 122 Graph Theory**

### **Course Outcome:**

- Explain basic concepts in graph theory.
- Define how graphs serve as models for many standard problems.
- Account for the theory of paths and degree of connectedness of graph.
- Learn the use of spanning tree.
- Discuss the concept of graph, tree, and Euler graph.
- See the applications of graphs in science, business and industry.
- To present a survey of essential topics for computer science students who will encounter some of them again in more advanced courses.

## **Course Title:- MTC 123 Mathematics Practical**

### **Course Outcome:**

- Students will be able to find eigen values and eigen vectors using Maxima software.
- Students will be able to perform operations on orthogonality and quadratic forms.
- Use appropriate modern technology to explore calculus concepts.

### **Course Title:- CSST 121 Method of Applied Statistics**

#### **Course Outcome:**

- To create a mathematical model that can be used to predict the values
- To Handle large data and analyze it by statistical tools

### **Course Title:- CSST 122 Continuous Probability Distribution and Testing of Hypothesis**

#### **Course Outcome:**

- To study distribution of various data
- Student should use these techniques for their project.

### **Course Title:- CSST 123 Statistics Practical Paper II**

#### **Course Outcome:**

- How to use statistical tools in real life situation.
- Handling data for research purpose

## **S. Y. B. Sc. (Computer Science) Semester- I**

### **Course Title:-CS-211 Data Structure**

#### **Course Outcome**

- Understand different methods of organizing large amount of data using data structure.
- Able to choose appropriate data structure as applied to specified problem definition.
- Understand various techniques for representation of the data in the real world.
- Able to compute the complexity of various algorithms.
- Able to understand internal structure of compiler and interpreters.

### **Course Title:- CS-212 RDBMS**

#### **Course Outcome**

- Able to understand database concepts and database management system software.
- Analyze and design a real database application.
- Develop and evaluate a real database application using a database management system.
- Able to develop applications using PL/SQL & front end tools.

### **Course Title: - ELC-211: Digital System Hardware**

#### **Course Outcome:**

- To study and understand basics of microprocessors.
- To understand fundamentals of multicore technology.

### **Course Title: - ELC-212: Analog Systems**

#### **Course Outcome:**

- To understand basics of analog electronics.
- To study different types of sensors.
- To understand different types of signal conditioning circuits.
- To learn data conversion techniques.
- To apply knowledge of analog systems in different applications.

### **Course Title:-MTC-211 Linear Algebra**

#### **Course Outcome:**

- Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces,
- Use the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism,
- Compute with the characteristic polynomial, eigenvectors, eigen values and Eigen spaces, as well as the geometric and the algebraic multiplicities of an eigen value and apply the basic Diagonalization result.

### **Course Title:-MTC-212 Numerical Techniques**

#### **Course Outcome:**

- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
- Apply numerical methods to obtain approximate solutions to mathematical problems.
- Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
- Analyze and evaluate the accuracy of common numerical methods.

### **Course Title:- EN-211:Technical English Sem - I**

#### **Course Outcome:**

- To expose students to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English.
- To enhance employability of the students by developing their linguistic competence and communicative skills.

## **S. Y. B.Sc.(Computer Science) Semester-II**

### **Course Title:- CS-221 Object Oriented Programming using C++ Course Outcome**

- Able to understand the concept of object oriented programming.
- Use the benefits of object oriented design and understand when it is an appropriate methodology to use.
- Design object oriented solutions for small systems involving multiple objects.

### **Course Title:-CS-222 Software Engineering Course Outcome**

- Able to design and conduct experiments, as well as to analyze and interpret data.
- Able to identify, formulate, and solve engineering problems.
- Able to analyze, design, verify, validate, implement, apply, and maintain software systems.
- Able to understand different phases of SDLC.

### **Course Title:-CS-223 Practical Based on CS-211 and CS221-Sem-I and II Course Outcome**

- Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
- Students will be able to use linear and non-linear data structures like stacks, queues, linked list etc.
- Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.
- Students will be able to perform programming in object-oriented language.
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.

### **Course Title:-CS-224 Practical Based on CS-212 and CS222-Sem-I and II Course Outcome**

- To use SQL- the standard language of relational databases.
- Able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- Able to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based.
- Students will be able to create report/documentation for real life projects.
- Can apply their knowledge and understanding with a professional approach.

### **Course Title: - ELC-221: The 8051 Architecture, Interfacing &**



### **Programming Course Outcome:**

- To study the basics of 8051 microcontroller, Programming and its Interfacing techniques.
- To apply knowledge of 8051 to design different application circuits.
- To introduce the basic concepts of advanced Microcontrollers.

### **Course Title: - ELC-222: Communication**

#### **Principles Course Outcome:**

- To understand basics of communication systems.
- To understand digital communication techniques.
- To introduce concepts in advanced wireless communication.

### **Course Title: - ELC-203: Practical**

#### **Course Course Outcome:**

- To use basic concepts for building various applications in electronics.
- To understand design procedures of different electronic circuits as per requirement.
- To build experimental setup and test the circuits.
- To develop skills of analyzing test results of given experiments.

### **Course Title:-MTC-221 Computational Geometry**

#### **Course Outcome:**

- Student will get acquainted with the typical problems of computational geometry.
- Student will understand the existing solutions and their applications in computer graphics and machine vision.
- Student will get deeper knowledge of mathematics.
- Student will learn the principles of geometric algebra including its application in graphics and vision related tasks.
- Student will practice programming, problem solving and defense of a small project.

### **Course Title:-MTC-222 Operation Research:**

#### **Course Outcome**

- Construct linear integer programming models and discuss the solution techniques.
- Set up decision models and use some solution methods for nonlinear optimization problems.
- Propose the best strategy using decision making methods under uncertainty and game theory.
- Solve multi-level decision problems using dynamic programming method.
- Formulate pure, mixed, and binary integer programming models.
- Formulate the nonlinear programming models.

### **Course Title:-MTC-223 Mathematics Practical**

#### **Course Outcome**

- Do basic 2- and 3-D plotting,

- Write code in the prescribed language for a number of algorithms for the topics covered given pseudo-code, or modify a given code to perform an indicated task,
- Debug code in the prescribed language at an appropriate level, and decide if they can make their code more efficient,
- Verify the correctness of a solution or decide whether the result is an acceptable approximation to the solution,
- Identify algorithms with which to solve mathematical problems, and
- Write programs from the underlying algorithms, and demonstrate the ability to employ good commenting and coding techniques.

### **Course Title:- EN-221: Technical English – Sem-II**

#### **Course Outcome:**

- To expose students to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English.
- To enhance employability of the students by developing their linguistic competence and communicative skills.

### **T.Y. B.Sc. (Computer Science)**

#### **Semester I Course Title:- CS-331 Systems Programming**

##### **Course Outcome :**

- Able to design structure of a simple editor.
- Able to design structure of Assembler and macro processor for an hypothetical simulated computer.
- Understand working of linkers and loaders and other development utilities.
- Understands Complexity of Operating system as a software.

#### **Course Title : CS-332 Theoretical Computer**

##### **Science Course Outcome :**

- Understand the fundamental mathematical , regular languages and finite automata
- Able to describe and transform regular expressions and grammars.
- Able to design different types of Finite Automata and Machine as Acceptor , verifier and translators.
- Able to understand the concept and design of push-down automata.
- Able to understand the design and different types of Turing machine .
- Understand the relation between context free languages, PDA and TM .
- Able to understand recursive enumerable languages, recursive function theory and Problems on recursive function.

#### **Course Title : CS-333 Computer**

##### **Networks –I Course Outcome :**

- Understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Able to identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

- Identify the different types of network devices and their functions within a network .
- Understand the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

**Course Title : CS-334 Internet**

**Programming I Course Outcome :**

- To understand client server architecture.
- Implement PHP, Server Side Scripting Language .
- To know how to implement socket programming.

**Course Title : CS-335 Programming in**

**Java-I Course Outcome :**

- Understand to implement object oriented programming concepts.
- Understand how to design graphical user interface in Java programs.
- Understand how to design and develop applets.
- Able to design User Interface using Swing and AWT.
- Understand concept of packages and study how to implement them.

**Course Title : CS-336 Object Oriented Software**

**Engineering Course Outcome :**

- Understand the importance of Object Orientation in Software engineering.
- Acquire knowledge of components of Unified Modeling Language .
- Able to understand techniques and diagrams related to structural modeling .
- Will learn techniques and diagrams related to behavioral modeling .
- Will learn different techniques of Object Oriented analysis, design and testing .

**T.Y. B.Sc. (Computer Science)**

**Semester II Course Title:- CS--341 Operating Systems**

**Course Outcomes:**

- Understand the role of operating system as System software.
- Able to compare the various algorithms and comment about performance of various algorithms used for management of memory, CPU scheduling, File handling and I/O operations.
- Understand various concept related with Deadlock to solve problems related with Resources allocation, after checking system in Safe state or not.
- To understand role of Process synchronization towards increasing throughput of system.

**Course Title:- CS-342 Compiler**

**Construction Course Outcomes:**

- Learn how to use lexical analyzer and parser generator tools.
- Understand how to build symbol tables and generate intermediate code.
- Will study compiler architecture.

- Study and understand the technique of compiler optimization.

**Course Title:- CS-343 Computer**

**Networks II Course Outcomes:**

- Will study how to configure PCs running Linux so that they receive IP addresses, have default routes, can resolve host names, and so on. (And similarly for Windows, if time permits.).
- Able to apply knowledge of the TCP/IP layering model to intelligently debug networking problems.
- Will be able to use Linux commands to understand how a PC is configured.
- Will be able to understand and build the skills of subnetting and routing mechanisms.

**Course Title : CS-344 Internet**

**Programming Course Outcomes :**

- Understand working of XML, CSS and XML parsers.
- Will learn to implement PHP framework for effective design of web application.
- Will use JavaScript to program the behavior of web pages.
- Will use AJAX to make our application more dynamic.

**Course Title : CS-345 Programming in**

**Java-II Course Outcome :**

- Understand how to use database programming using Java.
- Will be able to implement web development concept using Servlet and JSP.
- Will be able to develop a game application using multithreading.
- Learn and implement socket programming concept.

**Course Title:- CS-346 Computer**

**Graphics Course Outcomes:**

- Understand how to use graphics objects represented in computer.
- Will be able to correlate between user and computer through graphics.
- Able to increase the productivity through graphics.
- Understand programmer's perspective of working of computer graphics.

**Course Title:- CS-347 Practical Based on CS-331 and CS341-Sem-I**

**and II Course Outcomes:**

- Understand how to implement structure of a simple editor.
- Able to develop structure of Assembler and macro processor for an hypothetical simulated computer.
- Able to develop various algorithms used for management of memory, CPU scheduling, File handling and I/O operations.
- Understand how to develop Banker algorithms related with Resources allocation, after checking system in Safe state or not.

**Course Title:- CS-348 Practical Based on CS-335 and CS345-Sem-I and II and ComputerGraphics using Java**

**Course Outcomes:**

- Understand how to implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
- Able to identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
- Able to demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
- Able to demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Able to identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events .
- Able to identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.

**Course Title:- CS-349 Practical Based on CS-334 and CS344-Sem-I and II and Project Course Outcomes:**

- Able to design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.
- Learn how to implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism.
- Learn how to use AJAX Programming Technique to develop RIA.
- Able to develop simple web application using server side PHP programming and Database Connectivity using My SQL.
- Will understand how to build well-formed XML Document and implement Web Service using Java.

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### Program Outcome

- Provides technology-oriented students with the knowledge and ability to develop creative solutions.
- Develop skills to learn new technology.
- Apply computer science theory and software development concepts to construct computing-based solutions.
- Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications.

### M.Sc. (Computer Science) Sem – I

#### Course Title:-CSUT111: Paradigm of Programming Language

##### Course Outcomes:-

- To Understand the basic language implementation techniques
- Develop ability to learn new languages more quickly
- To understand the concept of functional programming language
- Develop ability to learn and write small programs in different programming Languages

#### Course Title:-CSUT112: Design and Analysis of Algorithm

##### Course Outcomes:-

- To design efficient algorithms using various algorithm designing strategies
- To analyze the problem and develop the algorithms related to these problems
- To classify the problem and apply the appropriate design strategy to develop algorithm
- To design algorithm in context of space and time complexity and apply asymptotic notation

#### Course Title:-CSUT113: Database Technologies

##### Course Outcomes:-

- To study types of NoSQL databases (Document oriented, key-value pairs, Column-oriented and Graph)
- To understand detailed architecture, define objects, load data, query data and performance tune NoSQL databases.
- Able to handle large volumes of structured, semi-structured, and unstructured data using database technologies.

#### Course Title:-CSDT114: Cloud computing (Choice Based Optional Paper)

##### Course Outcomes:-

- To understand the principles and paradigm of Cloud Computing
- Ability to design and deploy Cloud Infrastructure
- Understand cloud security issues and solutions

- Ability to understand role of Virtualization Technologies
- Design & develop backup strategies for cloud data based on features

**Course Title:-CSDT114: Artificial Intelligence (Choice Based Optional Paper)Course**

**Outcomes:-**

- To analyze and formalize the problem as a state space, graph, design heuristics
- Ability to represent solutions for various real-life problem domains using logic-based techniques
- Understand the numerous applications and huge possibilities in the field of AI
- Ability to express the ideas in AI research and programming language related to emerging technology.

**Course Title:-CSDT114: Web Services (Choice Based Optional Paper)Course**

**Outcomes:-**

- To understand the details of web services technologies like WSDL, UDDI, SOAP
- Ability to learn how to implement and deploy web service client and server
- Learn how to explore interoperability between different frameworks
- Understand architectural elements of a RESTful system

**Course Title:-CSUP115: PPL and Database Technologies Practical**

**Course Outcomes:-**

- Apply the knowledge of Scala to develop web-based applications
- Provides knowledge of code optimization
- To understand concept of interoperability.
- Students are able to build and maintain the databases handling in real life applications and daily needs.
- Able to perform hands-on NoSql database lab assignments that will allow students to use the four NoSQL database types via products such as Cassandra, MongoDB, Neo4J and Riak

**M.Sc. (Computer Science) Sem – II**

**Course Title:-CSUT121: Advanced Operating System**

**Course Outcomes:-**

- To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.
- To evaluate, and compare OS components through instrumentation for performance analysis.
- To analyze the various device and resource management techniques for timesharing and distributed systems
- To develop and analyze simple concurrent programs using transactional memory and message passing, and to understand the trade-offs and implementation decisions.

**Course Title:-CSUT122: Mobile Technologies**

**Course Outcomes:-**

- To gain knowledge of installing Android Studio and Cross Platform Integrated Development Environment.
- An ability to use the techniques, skills, and modern technology.
- To develop the different applications that mobile computing offers to people, employees, and businesses

- To develop high levels of technical competence in the field of mobile technology.

**Course Title:-CSUT123: Software Project Management Course**

**Outcomes:-**

- To identify the impact of IT projects on the performance of the organizations
- To understand, manage and develop IT infrastructure in different projects
- To develop strategies to calculate risk factors involved in IT projects
- To use project management software to control the design, implementation, closure, and evaluation of IT projects
- To estimate, plan, calculate, and adjust project variables.
- Apply project management practices to launch new programs, initiatives, products, services, and events relative to the needs of stakeholders.

**Course Title:-CSDT124: Project (Choice Based Optional Paper) Course**

**Outcomes:-**

- To demonstrate a depth of knowledge of modern technology.
- To complete an independent research project, resulting in at least a thesis publication, and research outputs in terms of publications in high impact factor journals, conference proceedings, and patents.
- Students will acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.
- Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it.

**Course Title:-CSDT124: Human Computer Interaction (Choice Based Optional Paper)**

**Course Outcomes:-**

- Apply an interactive design process and universal design principles to designing HCI systems.
- To analyze and discuss HCI issues in groupware, ubiquitous computing, virtual reality, multimedia, and Word Wide Web-related environments.
- Explain the importance of iteration, evaluation and prototyping in interaction design
- To analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.

**Course Title:-CSDT124: Soft Computing (Choice Based Optional Paper) Course**

**Outcomes:-**

- To discuss the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience
- To relate with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems
- To describe with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations

**Course Title:-CSUP125: Practical on Advanced OS & Mobile Technologies Course**

**Outcomes:-**

- Student can understand internal structure and operations of OS along with various processes including threading, inter process communication and synchronization with I/O operations.



- Awareness of computational issues, resources in distributed environment.
- To develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools.
- To understand how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.

### **M.Sc. (Computer Science) Sem – III**

#### **Course Title:-CS 301: Software Metrics & Project Management**

##### **Course Outcomes:-**

Student will able to:

- Get good knowledge of the issues and challenges faced while doing the Software project Management.
- To understand why majority of the software projects fails and how that failure probability can be reduced effectively.
- To do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.
- Students will learn a good communication skill, improve presentation and team forming ability

#### **Course Title:-CS 302: Mobile Computing**

##### **Course Outcomes:-**

Student will able to:

- Get familiar with various generations of mobile communications.
- Understand the concept of cellular communication
- Understand the basics of wireless communication
- Get the Knowledge of GSM mobile communication standard, its architecture, logical channels, advantages and limitations.
- Develop ability to develop Android Application

#### **Course Title:-CS 303: Soft Computing**

##### **Course Outcomes:-**

Student will able to:

- Understand the basic areas of Soft Computing including Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms.
- Provide the mathematical background for carrying out the optimization associated with neural network learning.
- Familiar with current research problems and research methods in Soft Computing by working on a research or design project.
- Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.

#### **Course Title:-CS-304: Project (Elective)**

##### **Course Outcomes:-**

- On successful completion of the course students will be able to:
- Demonstrate a sound technical knowledge of their selected project topic.
- Undertake problem identification, formulation and solution.
- Design engineering solutions to complex problems utilizing a systems approach.

- Conduct an engineering project
- Communicate with engineers and the community at large in written or oral forms.
- Demonstrate the knowledge, skills and attitudes of a professional engineer.
- Project-based learning connects students to the real world.
- Prepares students to accept and meet challenges in the real world, mirroring what professionals do every day.

**Course Title:-CS -305: Web Services (Elective)**

**Course Outcomes:-**

Student will able to:

- Understand Web Services and implementation model for SOA (Service Oriented Architecture)
- Understand cloud computing as a web service.
- Implement concepts of virtualization and data in cloud.
- Understand the use of web services in B2C and B2B applications.
- Will be able to implement an application that uses multiple web services in a realistic business scenario.

**Course Title:-CS -306: Database and System Administration (Elective)**

**Course Outcomes:-**

Student will able to:

- Establish a basic understanding of the process of Database Development and Administration using MySQL.
- Student will implement the concepts of both Operating Systems & Database Administration skills.
- Retrieve any type of information from a data base by formulating complex queries in MySQL
- Describe the important role of Linux operating system.

**M.Sc. (Computer Science) Sem – IV**

**Course Title: - CS-401: Industrial Training**

**Course Outcomes:-**

- On successful completion of the course students will be able to:
- Capability to acquire and apply fundamental principles of engineering.
- Become master in specialized technology
- Become updated with all the latest changes in technological world.
- Ability to communicate efficiently.
- Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.
- Ability to identify, formulate and model problems and find engineering solution based on a systems approach.
- Capability and enthusiasm for self-improvement through continuous professional development and life-long learning
- Awareness of the social, cultural, global and environmental responsibility as an engineer.