A.T.S.S.'s
College of Business Studies and Computer Applications
Chinchwad, Pune 19
(Affiliated to Savitribai Phule Pune University, Recognized by Govt. of Maharashtra , Accredited by NAAC)
Academic Year 2019 – 20
Program: MSc (Computer Science)
Department of Computer Science & Applications

Program Outcomes (PO)

PO1: Able to developed the necessary learning skills and independence for further studies.

PO2: Can initiate and lead projects within the scientific field and be responsible for the work of individuals and groups.

PO3: Can communicate scientific information, challenges and findings to scholars as well as to general audience.

PO4: Are capable of presenting and describing scientific issues and research findings.

PO5: Can make decisions in an independent, professional manner and support them.

PO6: Can decide which analytical methods and complex theories are applicable.

PO7: Can communicate statistical and mathematical information.

PO8: To help students build-up a successful career in Computer Science and to produce entrepreneurs who can innovate and develop software products

PEO – Program Educational Objectives:

1. To apply and continuously acquire knowledge, both theoretical and applied, related to core areas of computer science.
2. To solve diverse and unique problems in software design and development processes,
3. To work productively as computer professionals.

MSc (CS)
Semester I

Course: Paradigm of Programming Language (CSUT111)

At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction Names, Scopes, and Bindings	Explain the issues involved in programming language design and functional logic, object oriented programming paradigms
CO2	Control Flow Data Types	Explain the control flow, subroutines, parameter passing and design/implementation issues of Data types in different languages.
CO3	Subprograms and Implementing Subprograms	Explain the Subprogram.
CO4	Data Abstraction and Object Orientation	Explain the OOPs concept in different languages.
CO5	Functional Programming in Scala	Explain the new Functional language.
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Paradigm of Programming Language and engage in a life-long learning.

Course: Design and Analysis of Algorithm (CSUT112)

At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Basics of Algorithms	Explain the fundamentals of Design and Analysis of Algorithms
CO2	Divide and conquer strategy Greedy Method	Explain the Concept of Divide and Greedy method Conquer method to solve the real world problems
CO3	Dynamic Programming Decrease and Conquer	Explain the Dynamic programming techniques and concept of Divide and Conquer method to solve the real world problems
CO4	Backtracking Branch and Bound	Explain the concept of Backtracking, Branch and Bound to compute the real world problems.
CO5	Problem Classification	Explain the concept of NP Hard and NP Complete Problems
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Design and Analysis of Algorithm and engage in a life-long learning.

Course: Database Technologies (CSUT113)

At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to NOSQL (Core concepts) Implementation with NOSQL databases	Explain the basic concepts of NOSQL and the different database used in NOSQL.
CO2	Schema Migrations	Explain the schema is changed from RDBMS to NOSQL
CO3	Polygot Persistence (Multi model types)	Design the of different NOSQL database in

		enterprise and changing the traditional database to NOSQL.
CO4	Beyond NoSQL	Explain the file system in NOSQL and different database can be used other than NOSQL
CO5	Choosing your database	Explain the selection of NOSQL database, so that the performance of application increases.
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Database Technologies and engage in a life-long learning.

Course: Artificial Intelligence (CSDT114B)
At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to Artificial Intelligence	Understand the concept of Artificial Intelligence
CO2	Searching	Design and implement the of searching techniques
CO3	Knowledge representation	Understand the basics of knowledge representation
CO4	Introduction to AI with python	Design and implement the python programming
CO5	Machine learning	Understand the concept of machine learning and able to apply ML Algorithm
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Artificial Intelligence and engage in a life-long learning.

Semester II

Course: Advanced Operating System (CSUT121)
At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to UNIX/Linux Kernel	Develop the software in and for Linux/UNIX environments.
CO2	File and Directory I/O	Explain the theory and implementation of processes, resource control.
CO3	Process Environment, Process Control and Process Relationships	Explain the process management policies and scheduling of processes by CPU.
CO4	Memory Management	Explain the concepts and implementation Memory management policies and virtual memory.
CO5	Signal Handling	Analyze the system in s- domain and explain mathematical description and representation of continuous and discrete time signals and systems.
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Advanced Operating System and engage in a life-long learning.

Course: Software Project Management (CSUT113)

At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to Project Management Project Management Components	Explain the scope project and project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders
CO2	Scope Management Time management Cost Management Quality Management Human Resource Management Communication Management Risk Management Procurement Management	Explain the all aspects of project management.
CO3	Software Metrics Software Reliability	Explain the role of project management in organization change
CO4	Planning a measurement program	Explain the projects in response to issues that arise internally and externally.
CO5	Quality Standards	Utilize technology tools for communication, collaboration, information management, and decision support.
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Software Project Management and engage in a life-long learning.

Course: Mobile Technologies (CSUT122)

At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to Mobile Computing	Understand the fundamental design paradigms and technologies to mobile computing applications.
CO2	Android Fundamentals	Understand the fundamentals of Android operating systems
CO3	Android UI Design Advanced Android Programming	Develop software on mobile platform and software with reasonable complexity on mobile platform.
CO4	Android Thread and Notification	Understand the thread and notification in Android
CO5	Phone Gap Programming iOS Fundamentals	Understand the Phone Gap programming and fundamentals of iOS operating system.
CO6	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Mobile Technologies and engage in a life-long learning.

Semester III

Course Software Architecture and Design Pattern (CSUT231)
At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction	Understand types of UML Diagram. Understand RUP (Rational Unified Process). Understand Phases of RUP. Understand Life cycle .
CO2	Software Architecture	Able to understand the basic concepts of software architecture and software architecture Business cycle. Using concepts from architecture description languages, they will learn to deconstruct existing systems and then extend them with new capabilities.
CO3	Architectural Styles	Understand the various architectural styles with case studies. Students will understand requirements traceability and how to insure the system meets cross-cutting end-to-end software architectural properties
CO4	Introduction to Patterns	Design creational and structural patterns Learn about behavioural patterns.
CO5	Study of Design Patterns	Understand the concepts of various architectural patterns and some design patterns
CO6	GRASP(General Responsibility Assignment Software Patterns)	Understand a collection of general objected-oriented design patterns related to assigning defining objects. Understand how to apply UML and patterns.
CO7	Study of Frameworks	The class project will involve mixing architectural styles including distributed computing, service-oriented architectures, database-centric architectures, web architectures. Understand Struts and Hibernate Frameworks
CO8	Case Study (struts or any other web Architecture)	Do a case study in utilizing architectural structures.
CO9	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Paradigm of Programming Language and engage in a life-long learning.

Course: Machine Learning (CSUT232)
At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Introduction to Machine Learning	Recognize the characteristics of machine learning that make it useful to real-world problems. Understand statistic applied in Ml
CO2	Machine Learning Models	Interpret the concepts of supervised Unsupervised and Semi supervised learning. Differentiate various learning approaches. Use of matrices for evaluation.
CO3	Regression Models	Understand working of Regression Model and SVM.
CO4	Classification Models	Apply theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points. Identify classifier model for machine learning applications.
CO5	Clustering Models	Illustrate and apply clustering algorithms and identify its applicability in real life problems.
CO6	Association Rules	Understand Key Terms: Support, Confidence and Lift. Working of Apriori Algorithm.
CO7	Reinforcement Learning	Understand Reinforcement learning ,Q learning and their application.
CO8	Deep Learning	Illustrate the working Neural Networks (ANN,CNN,RNN).
CO9	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Paradigm of Programming Language and engage in a life-long learning.

Course: Web Framework (CSUT233)
At the end of the course following outcome is expected:

	Course unit Description	Outcome
CO1	Java Script Basics	Understands basics of JavaScript like dataypes, variables, etc. Learn HTML DOM, Promises, and call backs
CO2	Introduction to Node JS	Learn introduction to Node js with its advantages Learn how to install Node js.

CO3	Node JS Modules	Explore what is functions, buffer, modules and directories in Node js
CO4	Node Package Manager	Learn about Node Package Manager How to install, update package globally
CO5	Web Server	Learn how to create Web Server How to handle HTTP request, HTTP streaming.
CO6	File System	Understands File Model Also learn the various file operations like read, write etc.
CO7	Events	Learn about Asynchronous JS Promises
CO8	Working with Databases	Learn various database operations Learn Mongoose database and querying with Mongoose database.
CO9	Express JS	Learn what is Express JS Understands routing, responding, configuration, views, error handling in detail.
CO10	Introduction to DJango	Learn what is DJango Learn how to get and install DJango
CO11	Getting Started with DJango	Learn about 3 core files : model.py, urls.py, views.py Setting up database connections (MySQL/SQLServer) Installing and using 'Out of the Box' Django features
CO12	DJango URL Patterns and Views	Learn how to design a good URL schema
CO13	DJango Forms	Learn various Form Classes, its Validations, Authentication, Advanced Form Processing Techniques Learn DJango REST Framework and DJango Piston
CO14	Practical and Oral	Improve written, oral, and presentation communication skills related to the subject of Paradigm of Programming Language and engage in a life-long learning.

CSUIT241: Industrial Training /Institutional Project   **Total Credits: 20**

At the end of the course following outcome is expected:

CO 1	Participate in the projects in industries during his or her industrial training.
CO 2	Describe use of advanced tools and techniques encountered during industrial training and visit.
CO 3	Interact with industrial personnel and follow engineering practices and discipline prescribed in industry.
CO 4	Develop awareness about general workplace behavior and build interpersonal and team skills.
CO 5	Prepare professional work reports and presentations.