Maratha Vidya Prasarak Samaj's
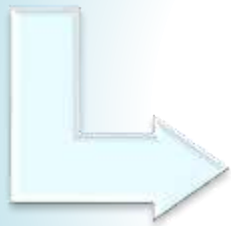
Karmaveer Shantarambapu Kondaji Wavare Arts, Science and Commerce College, CIDCO, Nashik

Uttamnagar, Nashik- 422 008 (Maharashtra)

Internal Quality Assurance Cell

Programme Outcomes (PO's)

Programme Specific Outcomes (PSO's)

Course Outcomes (CO's)

Syllabus: 2013 Pattern

Maratha Vidya Prasarak Samaj's
**KARMAVEER SHANTARAMBAPU KONDAJI WAVARE
ARTS, SCIENCE AND COMMERCE COLLEGE,CIDCO**
Uttamnagar, Nashik- 422 008 (Maharashtra)

Principal
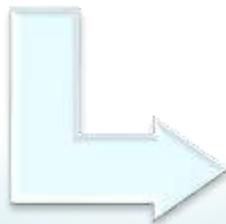**Prof. (Dr) S. K. Kushare**
M.Sc., Ph. D.

Affiliated to Savitribai Phule Pune University   Id. No. PU/NS/ASC/047/1993
AISHE C-42086   NAAC Re-accredited 'A' Grade (III Cycle 2017-22, CGPA 3.20)
Best College Award of Savitribai Phule Pune University Pune in 2009-10 and 2021-22

Programme Outcome (PO's), Programme Specific Outcome (PSO's), Course Outcome (CO's)
Department: Computer Science
Syllabus: 2019 Pattern

Programme and Courses:

Sr. No.	Name of the Programme	Year of introduction of programme	Duration of introduction of Programme
2	M. Sc. Comp. Sci.	2008-09	2 Years

Programme Specific Outcome (M.Sc. Computer Science)

Sr. No.	Programme Specific Outcome (M.Sc. Computer Science)
PSO 1	Provides technology-oriented students with the knowledge and ability to develop creative solutions.
PSO 2	Develop skills to learn new technology.
PSO 3	Apply computer science theory and software development concepts to construct computing-based solutions.
PSO 4	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications.
PSO 5	Get some development experience within a specific field of Computer Science, through project work.

Programme Specific Outcome (M.Sc. Computer Science)

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
M.Sc. Sem I	CS-101	Principles of Programming Languages	CO 1: Students will prepare themselves to think about programming languages analytically. They will be able to separate syntax from semantics.
			CO 2: Students will be able to understand how language features work like Data types, control flow, Subroutines, Data abstraction etc. students will Learn new languages more quickly and Use standard vocabulary when discussing languages.
			CO 3: Students will develop a greater understanding of the issues involved in programming language design and implementation. Students will familiar with design issues of object –

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
			oriented and functional languages
			CO 4: Students will learn Functional, Logic Languages like Prolog, Lisp.
			CO 5: Students will know how to analyze semantic issues associated with function implementations, including variable binding, scoping rules, parameter passing.
	CS-102	Advanced Networking	CO 1: Students will understand the basic components of Networking.
			CO 2: Students will understand how these components are used in different project.
			CO 3: Students will understand how to write research paper for innovative idea.
			CO 4: Cryptography technique knowledge for understanding various Algorithm for security.
			CO 5: Internet Security protocol used for e-business and e-Banking security.
	CS-103	Distributed Database Concepts	CO 1: Students will understand the basic concepts of Distributed Database.
			CO 2: Students will understand how these concepts are used in different project where the data is concern.
			CO 3: Students will understand how to store, manipulate and maintain the data if it is Distributed over multiple sites at time.
			CO 4: Student will understand which is the best as well feasible technique to store data into database
			CO 5: Student will understand how to recover from the failure by using algorithms, if any occurs
	CS-104	Design and Analysis of Algorithms	CO 1: Students will learn fundamental concepts of asymptotic notations of an algorithm, Space & Time Complexity, Searching & Sorting Algorithms, Divide and Conquer techniques.
			CO 2: Students will know various design and analysis techniques such as greedy algorithms, dynamic programming.
			CO 3: Student will understand the techniques used for designing of different graph algorithms.
			CO 4: Students will learn how to apply backtracking, branch and bound techniques for real time problems.
			CO 5: Students will know the concepts of P, NP and NP-Complete problems.
	CS-105	Network Programming	CO 1: Students will understand the basic components of Network Programming
			CO 2: Students will understand how these components are used in different project on

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
			networks using client-server Technology.
			CO 3: Students will understand how to Transmit data over network.
			CO 4: Student will understand which is the best protocol for the Transmission of data which cause less failure on network
			CO 5: Student will understand how to recover from the failure if any occurs on network.
M. Sc. Sem II	CS-201	Digital Image Processing	CO 1: understand the need for image transforms different types of image transforms and their properties.
			CO 2: develop any image processing application.
			CO 3: understand the rapid advances in Machine vision.
			CO 4: learn different techniques employed for the enhancement of images.
			CO 5: learn different causes for image degradation and overview of image restoration techniques.
	CS-202	Advanced Operating Systems	CO 1: To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.
			CO 2: To evaluate, and compare OS components through instrumentation for performance analysis.
			CO 3: To analyze the various device and resource management techniques for timesharing and distributed systems
			CO 4: To develop and analyze simple concurrent programs using transactional memory and message passing, and to understand the trade-offs and implementation decisions.
	CS-203	Data Mining and Data Warehousing	CO 1: Understand the functionality of the various data mining and data warehousing component
			CO 2: Appreciate the strengths and limitations of various data mining and data warehousing models
			CO 3: Explain the analyzing techniques of various data
			CO 4: Describe different methodologies used in data mining and data ware housing.
			CO 5: Compare different approaches of data ware housing and data mining with various technologies.
	CS-204	Project	CO 1: Acquire skills to developed the software project.

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
			CO 2: Understand the software development life cycle.
	CS-205	Programming With DOT NET	CO 1: design web applications using .NET
			CO 2: use .NET controls in web applications
			CO 3: create database driven .NET web applications and web services
M. Sc. Sem III	CS-301	Software Metrics & Project Management	CO 1: Students will understand Software Engineering and basic testing Concepts.
			CO 2: Students will know skills that are required to ensure successful medium and large scale software projects.
			CO 3: Learn to select and apply project management techniques for process modeling, planning, estimation, risk management.
			CO 4: Student will learn software verification.
			CO 5: Understand design and execution of system test cases.
	CS-302	Mobile Computing	CO 1: Explain the basic concepts of wireless network and wireless generations.
			CO 2: Demonstrate the different wireless technologies such as CDMA, GSM, GPRS , etc.
			CO 3: Describe and judge the emerging wireless technologies standards such as WLAN, WMAN.
			CO 4: Explain the design considerations for deploying the wireless network infrastructure.
			CO 5: Differentiate and support the security measures standards.
	CS-303	Soft Computing	CO 1: Analyze and integrate various soft computing techniques in order to solve problems effectively and efficiently.
			CO 2: Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
			CO 3: Apply neural networks to pattern classification and regression problems
			CO 4: Apply genetic algorithms to combinatorial optimization problems.
			CO 5: Apply these techniques in applications which involve perception, reasoning and learning.
			CO 6: Students will understand the fundamental theory and concepts of neural networks, neuron modelling, several neural network paradigms and its applications.
	CS-304	Project	CO 1: Acquire skills to developed the software project.

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
			CO 2: Understand the software development life cycle.
	CS-305	Web Services	CO 1: Define Cloud Computing and memorize the different Cloud service and deployment models.
			CO 2: Describe importance of virtualization along with their technologies.
			CO 3: Use and Examine different cloud computing services.
			CO 4: Describe the key components of Amazon Web Service.
			CO 5: Design & develop backup strategies for cloud data based on features.
M.Sc. Sem IV	CS-401	Industrial Training	CO 1: On successful completion of the course students will be able to:
			CO 2: Capability to acquire and apply fundamental principles of engineering.
			CO 3: Become master in specialized technology
			CO 4: Become updated with all the latest changes in technological world.
			CO 5: Ability to communicate efficiently.
			CO 6: Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.
			CO 7: Ability to identify, formulate and model problems and find engineering solution based on a systems approach.
			CO 8: Capability and enthusiasm for self-improvement through continuous professional development and life-long learning

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IQAC Coordinator

IQAC

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Syllabus: 2019 Pattern

Maratha Vidya Prasarak Samaj's
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ARTS, SCIENCE AND COMMERCE COLLEGE,CIDCO**
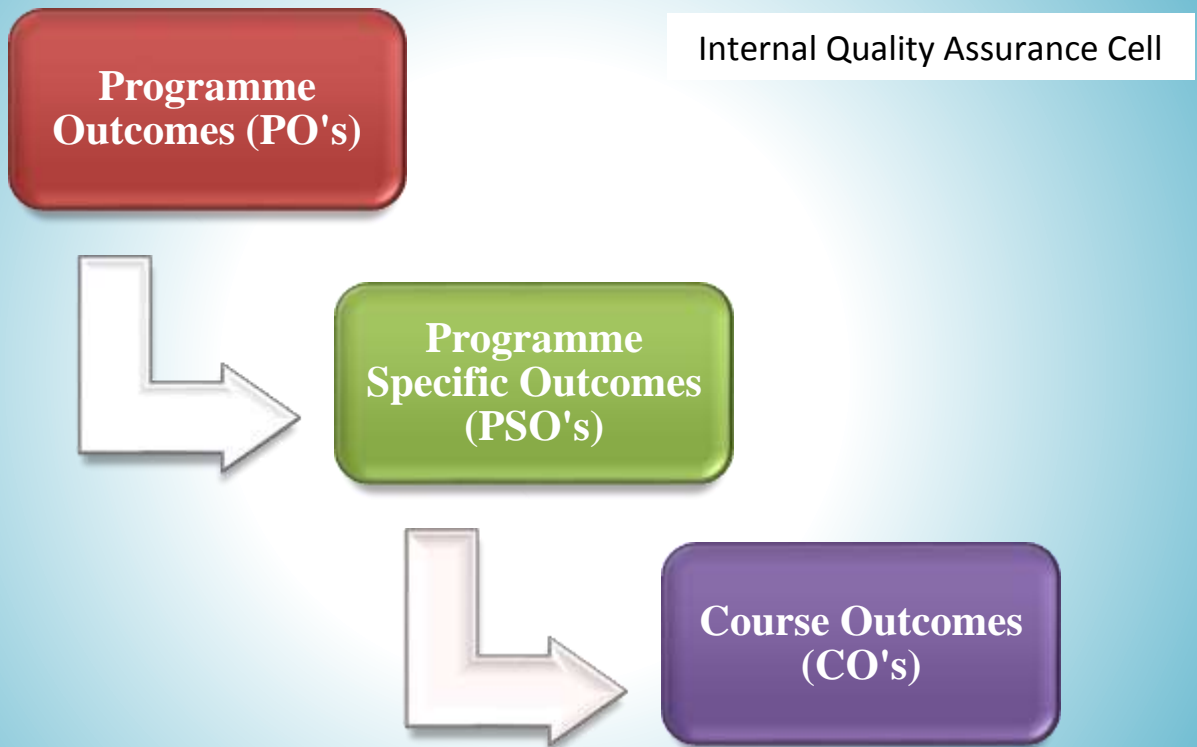**Uttamnagar, Nashik- 422 008 (Maharashtra)**
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Department: Computer Science
Syllabus: 2019 Pattern

Programme and Courses:

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Programme Specific Outcome (M.Sc. Computer Science)

Sr. No.	Programme Specific Outcome (M.Sc. Computer Science)
PSO 1	Provides technology-oriented students with the knowledge and ability to develop creative solutions.
PSO 2	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications.
PSO 3	Apply computer science theory and software development concepts to construct computing-based solutions.
PSO 4	Develop skills to learn new technology.
PSO 5	Apply design and development principles in the construction of software systems of varying complexity.

Course Specific Outcome (M.Sc. Computer Science)

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
.Sc. Sem I	CSUT 111	Paradigm of Programming Language	CO 1: To Understand the basic language implementation techniques
			CO 2: Develop ability to learn new languages more quickly
			CO 3: To understand the concept of functional programming language
			CO 4: Develop ability to learn and write small programs in different programming Languages
	CSUT 112	Design and Analysis of Algorithm	CO 1: To design efficient algorithms using various algorithm designing strategies
			CO 2: To analyze the problem and develop the algorithms related to these problems

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
			CO 3: To classify the problem and apply the appropriate design strategy to develop algorithm
			CO 4: To design algorithm in context of space and time complexity and apply asymptotic notation
	CSUT 113	Database Technologies	CO 1: To study types of NoSQL databases (Document oriented, key Value pairs, Column-oriented and Graph)
			CO 2: To understand detailed architecture, define objects, load data, query data and performance tune NoSQL databases.
			CO 3: Able to handle large volumes of structured, semi-structured, and unstructured data using database technologies.
	CSDT 114	Cloud computing	CO 1: To understand the principles and paradigm of Cloud Computing
			CO 2: Ability to design and deploy Cloud Infrastructure
			CO 3: Understand cloud security issues and solutions
			CO 4: Ability to understand role of Virtualization Technologies
			CO 5: Design & develop backup strategies for cloud data based on features
	CSUP 115	PPL and Database Technologies Practical	CO 1: Apply the knowledge of Scala to develop web-based applications.
			CO 2: Provides knowledge of code optimization
			CO 3: To understand concept of interoperability.
			CO 4: Students are able to build and maintain the databases handling in real life applications and daily needs.
			CO 5: Able to perform hands-on NoSql database lab assignments that will allow students to use the four NoSQL database types via products such as Cassendra, MongoDB,Neo4J and Riak

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
M. Sc. Sem II	CSUT 121	Advanced Operating System	CO 1: To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
			CO 2: To evaluate, and compare OS components through instrumentation for performance analysis.
			CO 3: To analyze the various device and resource management techniques for timesharing and distributed systems
			CO 4: To develop and analyze simple concurrent programs using transactional memory and message passing, and to understand the trade-offs and implementation decisions.
	CSUT 122	Mobile Technologies	CO 1: To gain knowledge of installing Android Studio and Cross Platform Integrated Development Environment.
			CO 2: An ability to use the techniques, skills, and modern technology.
			CO 3: To develop the different applications that mobile computing offers to people, employees, and businesses
			CO 4: To develop high levels of technical competence in the field of mobile technology.
	CSUT 123	Software Project Management	CO 1: To identify the impact of IT projects on the performance of the organizations
			CO 2: To understand, manage and develop IT infrastructure in different projects
			CO 3: To develop strategies to calculate risk factors involved in IT projects
			CO 4: To use project management software to control the design, implementation, closure, and evaluation of IT projects
			CO 5: To estimate, plan, calculate, and adjust project variables.
	CSUT 124	Project	CO 1: To demonstrate a depth of knowledge of modern technology.
			CO 2: 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.
			CO 3: 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.
			CO 4: Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it.

Class	Subject code	Title	COs: After successful completion of This course, student will be able to
	CSUT 125	Practical on Advanced OS & Mobile Technologies	CO 1: Student can understand internal structure and operations of OS along with various processes including threading, inter process communication and synchronization with I/O operations.
			CO 2: Awareness of computational issues, resources in distributed environment.
			CO 3: 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.
			CO 4: To understand how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
M. Sc. Sem III	CSUT 231	Software Metrics & Project Management	CO 1: Get good knowledge of the issues and challenges faced while doing the Software project Management.
			CO 2: To understand why majority of the software projects fails and how that failure probability can be reduced effectively.
			CO 3: To do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.
			CO 4: Students will learn a good communication skill, improve presentation and team forming ability
	CSUT 232	Machine Learning	CO 1: Explain Machine Learning concepts, classifications of Machine Learning and write simple programs using python.
			CO 2: Describe Supervised Learning concepts.
			CO 3: Explain Support Vector Machine concepts.
			CO 4: Describe unsupervised learning concepts and dimensionality reduction techniques.
			CO 5: Discuss simple Machine Learning applications in a range of real-world applications using Python programming

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
	CSUT 233	Web Frameworks	CO 1: Get the introduction of modern web technologies.
			CO 2: Learn and use server side programming using Node.js
			CO 3: Understand the asynchronous programming.
			CO 4: Learn and understand web application in Django a Python Web Framework.
	CSUT 234	Project	CO 1: To demonstrate a depth of knowledge of modern technology.
			CO 2: 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.
			CO 3: 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.
			CO 4: Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it.
	CSUT 235	Practical Course based on CSUT 231, CSUT 232 and CSUT 233	CO 1: Students can write java programs using Design Pattern and Frameworks to create reusable and
			CO 2: Learn about flexible software systems.
			CO 3: Understands about the process of deploying web apps using specific Frameworks.
			CO 4: Students can write python programs using machine learning algorithms for solving practical

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
M.Sc. Sem IV	CSUT241	Industrial Training	CO 1: Capability to acquire and apply fundamental principles of engineering.
			CO 2: Become master in specialized technology
			CO 3: Become updated with all the latest changes in technological world.
			CO 4: Ability to communicate efficiently.
			CO 5: Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.

Class	Subject code	Title	COs: After successful completion of this course, student will be able to
			CO 6: Ability to identify, formulate and model problems and find engineering solution based on a systems approach.
			CO 7: Capability and enthusiasm for self-improvement through continuous professional development and life-long learning

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