

Dept. of Computer Science
Shivraj College of Arts, Commerce and D.S.Kadam Science College, Gadhinglaj

Master of Computer Science

Program Outcomes (POs) :

At the end of the Master of Science (Computer Science) Programme, graduating students/graduates will be able to:

1. Communicate computer science concepts, designs, and solutions effectively and professionally
2. Apply knowledge of computing to produce effective designs and solutions for specific problems
3. Identify, analyse, and synthesize scholarly literature relating to the field of computer science Use software development tools, software systems, and modern computing platforms.
4. Prepare for academic roles through NET/SET/PhD
5. Apply design and development principles in the construction of software systems of varying complexity.

Program Specific Outcomes (PSOs) :

1. Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.
2. Ability to understand the structure and development methodologies of software systems.
3. Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms.
4. Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

AEC – I & II Communicative English:

Course outcomes:

1. Learn to communicate effectively using email, letters etc.
2. Improve Telephonic communication skills.
3. Create Blogs, Email pal etc.

MSc-I Semester-I (Computer Science)

CC-101: Design and Analysis of Algorithms

Course outcomes:

4. Analyse the asymptotic performance of algorithms.
5. Demonstrate a familiarity with data structures and algorithms.
6. Compare algorithms based on time & space complexity.
7. Employ graphs to model real life problems, when appropriate. Develop algorithms that employ graph computations as key components, and analyse them.
8. Mapping of data structures like Stack, Queue and Linked List to real life problems.
9. Master the implementation of linked data structures such as linked lists and binary trees.
10. Be familiar with advanced data structures such as balanced search trees, hash tables, Red-Black trees, Btrees.
11. Understand Divide & Conquer approach, Greedy algorithm, Backtracking approach for algorithm design.
12. Be familiar with Branch and Bound & Dynamic programming

MSc-I Semester-I (Computer Science)

CC-102: Python Programming

Course Outcomes:

1. Understand principles of Python
2. Understand object oriented programming
3. Demonstrate file handling techniques
4. Understand how Python can be used for application development
5. Design Real life problems and think creatively about solution of them
6. Apply a solution clearly and accurately in a program using python

MSc-I Semester-I (Computer Science)

CC-103: Database Management System

Course Outcomes:

After successful completion of the course, the student will be able to

- 1) Define the terminology, features, classifications, and characteristics embodied in database systems.
- 2) Demonstrate an understanding of the relational data model.
- 3) Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
- 4) Formulate, using SQL, solutions to a broad range of query and data update problems.
- 5) Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
- 6) Use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database.
- 7) Use PL/SQL for handling data in a database as per the user's requirement using programming features.
- 8) Define various cursors and its implementation along with procedure and functions.

MSc-I Semester-I (Computer Science)

OE-104: Cyber Security

Course Outcomes:

- 1) Realize the need for Cyber Security
- 2) Understand the need for Security in day to day communications
- 3) Understand the vulnerabilities in the Network and Computer System
- 4) Understand the cyber law and Cyber Forensics

MSc-I Semester-I (Computer Science)

CCPR-105: Python Lab

Lab assignments based on Python Programming course.

MSc-I Semester-I (Computer Science)

CCPR-106: Database Lab

Lab assignments based on Database Management System course.

MSc-I Semester-I (Computer Science)

CCPR-107: Project

Course outcomes:

- 1) Gain skills as they apply knowledge effectively in diverse contexts.
- 2) Analyse and model requirements and constraints for the purpose of designing and implementing software artefacts and IT systems
- 3) Design and implement software solutions that accommodate specified requirements and constraints, based on analysis or modelling or requirements specification
- 4) Present a clear, coherent and independent exposition of software applications, alternative IT solutions, and decision recommendations to both IT and non-IT personnel via technical reports of professional standard and technical presentations.
- 5) Team work: Work effectively in different roles, to form, manage, and successfully produce outcomes from teams, whose members may have diverse cultural backgrounds and life circumstances, and differing levels of technical expertise.

A software module development should be carried out as part of Project.

MSc-I Semester-II (Computer Science)

CC-201: Web Technology

Course Outcomes:

After Completion of this course the student would be able to:

To familiarize a student with windows and web-based application.

To provide a student with the solid foundation of the syntax and semantics of C# as well as architecture of the .NET framework.

Debug and deploy ASP.NET web applications.

Discuss the insights of internet programming and implement complete application over the web.

To inculcate skills pertaining to data access technology geared to facilitate the development of disconnected systems using .NET platform.

To familiarize the student with the development of windows-based application using C#.

To familiarize the student with the development of web-based application using ASP.NET.

Handle various toolkit like AJAX.

Utilize the concepts of JavaScript.

MSc-I Semester-II (Computer Science)

CC-202: Advanced Java

Course Objectives:

- 1) The student will be able to develop distributed business applications, develop web pages using advanced server-side programming through servlets and Java server pages.
- 2) Demonstrate approaches for performance and effective coding
- 3) Develop Java client/server applications.
- 4) Develop distributed applications using RMI
- 5) Develop component-based Java software using JavaBeans
- 6) Develop server side programs in the form of servlet
- 7) Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB), use Struts frameworks, which gives the opportunity to reuse the codes for quick development and map Java classes and object associations to relational database tables with Hibernate mapping files

MSc-I Semester-II (Computer Science)

CC-203: Android Fundamentals Development

Course outcomes:

- 1) Understand Android Studio Environment and application structure.
- 2) Demonstrate different layouts, views, activities and intents
- 3) Testing and debugging of application.
- 4) Design good user interface for the application.
- 5) Able to store, retrieve and load data
- 6) Demonstrate background tasks & events
- 7) Understand publishing of app.

MSc-I Semester-II (Computer Science)

Elective-I: CE-204

CE-204.1: Software Project Management

Course outcomes:

- 1) To understand Software Project Models and Software Management Concepts.
- 2) To understand the various methods of Cost Estimation.
- 3) To Study about Software Quality Management.
- 4) To Study about Emerging Trends in Software Management.
- 5) To understand Project Evaluation.

MSc-I Semester-II (Computer Science)

Elective-I: CE-204

CE-204.2: Data Science Foundations

Course outcomes:

After successful completion of this course students are able to:

- 1) Understand the concept of Probability and Information Theory
- 2) Compute probabilities of events
- 3) Explain Bayes rule and compute probabilities using Bayes rule
- 4) To formulate and solve classification problem
- 5) To investigate clustering techniques for particular data
- 6) To mine frequent pattern in a dataset

MSc-I Semester-II (Computer Science)

Elective-I: CE-204

CE-204.3: Application Security Analyst

Course outcomes:

- 1) Understand application development life cycle
- 2) Identify vulnerabilities, entry points, error code etc.
- 3) Get acquainted with password cracking techniques and prevention techniques.
- 4) Understand authentication and authorization vulnerabilities.
- 5) Demonstrate use of SQL injection.
- 6) Investigate Session & browser manipulations

MSc-I Semester-II (Computer Science)

Elective-I: CE-204

CE-204.4: Cloud Computing

Course outcomes:

- 1) Introduce the broad perspective of cloud architecture and model
- 2) Apply different cloud programming model as per need.
- 3) Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications
- 4) To learn how to use Cloud Services.
- 5) To implement Task Scheduling algorithms.
- 6) To build Private Cloud.

MSc-I Semester-II (Computer Science)

CCPR-205: Web Technology Lab

Course outcomes:

- 1) Debug and deploy ASP.NET web applications
- 2) Discuss the insights of internet programming and implement complete application over the web
- 3) Use the features of Dot Net Framework along with the features of C#
- 4) Build and host web applications using ASP.NET
- 5) Develop and deploy Windows applications
- 6) Handle data by using ADO.NET architecture
- 7) Create database-driven ASP.NET web applications and web services
- 8) Handle various toolkit like AJAX

MSc-I Semester-II (Computer Science)

CCPR-206: Advanced Java Lab

Course outcomes:

1. Define & explain applet Life cycle
2. Differentiate local and remote applet
3. Write the code for a simple Java applet
4. Explain applet tag and its parameter
5. Use the methods of the Applet and Component classes required for a basic applet
6. Describe the classes in the AWT package that relate to the Applet class
7. Describe the AWT graphics explain controls and how to apply them in the container
8. Develop simple programs using Event class and Event Listener Interface
9. Develop a program for steps to connect a database

10. Describe the Basics of JDBC
11. Explain the different Types of JDBC drivers & their advantages and Disadvantages
12. Develop program to use JDBC to query a database and modify
13. Describe life cycle of servlet
14. Develop program using javax.servlet package
15. Explain JSP Architecture and its Life cycle
16. Develop simple program

MSc-I Semester-II (Computer Science)

CCPR-207: Project

Course outcomes:

1. Gain skills as they apply knowledge effectively in diverse contexts.
2. Analyse and model requirements and constraints for the purpose of designing and implementing software artefacts and IT systems
3. Design and implement software solutions that accommodate specified requirements and constraints, based on analysis or modelling or requirements specification
4. Present a clear, coherent and independent exposition of software applications, alternative IT solutions, and decision recommendations to both IT and non-IT personnel via technical reports of professional standard and technical presentations.
5. Team work: Work effectively in different roles, to form, manage, and successfully produce outcomes from teams, whose members may have diverse cultural backgrounds and life circumstances, and differing levels of technical expertise.
- 6. A software module development should be carried out as part of Project work.**

**MSc-II Semester-III (Computer Science)
(New Syllabus from June 2020)**

ICT Tools

Non- CGPA [EC]

Study hours per week: 02 Credit: 02

Course Outcomes:

1. Understand importance & need of modern ICT tools in education.
2. Use social networking sites for Research & academics.
3. Work on different projects & assignments through online mode.
4. Use applications of Google for academics, carry out Scholarly writing using Ms-Word.

SWM-301:: Artificial Intelligence

Course outcomes:

1. Apply problem solving by intelligent search approach.
2. Represent knowledge using AI knowledge representation techniques.
3. Design Machine Learning solution to real life problems.
4. Derive solutions for problems with uncertainty using Fuzzy theory.
5. Define a NLP problem and find a suitable solution to it.
6. To develop a good understanding of all aspects of Natural Language Processing (NLP) and Genetic algorithm

MSc-II Semester-III (Computer Science)

CC-302: Advanced Web Technology

Course outcomes:

1. Students will able to develop windows form application using C#
2. Students will be able to understand client-server architecture
3. Students will be able to develop web form application using ASP.NET
4. Students will be able to develop application using MVC

MSc-II Semester-III (Computer Science)

CC-303: PHP

Course outcomes:

1. Understand how server-side programming works on the web.
2. PHP Basic syntax for variable types and calculations.
3. Creating conditional structures

4. Storing data in arrays
5. Using PHP built-in functions and creating custom functions
6. Write PHP scripts to handle HTML forms.
7. Understanding POST and GET in form submission.
8. How to receive and process form submission data.
9. Reading and writing cookies.
10. Create PHP programs that use various PHP library functions, and that manipulate files and directories.
11. Analyze and solve common Web application tasks by writing PHP programs.

MSc-II Semester-III (Computer Science)

Elective-II: CE-304.1: Software Quality Assurance

Course outcomes:

1. Understand the basic tenets of software quality and quality factors.
2. Be exposed to the Software Quality Assurance (SQA) architecture and the details of SQA components.
3. Understand of how the SQA components can be integrated into the project life cycle.

MSc-II Semester-III (Computer Science)

Elective-II: CE-304.2: Advanced Data Science

Course outcomes:

1. Introduce major deep learning algorithms, the problem settings, and their applications to solve real world problems.
2. Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
3. Implement deep learning algorithms and solve real-world problems.

MSc-II Semester-III (Computer Science)

Elective-II: CE-304.3: Network Security Analyst

Course outcomes:

1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of network security.
2. Apply different verification techniques to achieve authentication and create secure applications
3. Apply network security basics, analyze different attacks on networks
4. Get introduced to port scanning, Sniffing , identity attacks etc.
5. Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications
6. Understand different Kerberos versions and working of firewalls.

MSc-II Semester-III (Computer Science)

Elective-II: CE-304.4: Internet of Things

Course outcomes:

1. Apply the concepts of IoT.
2. Identify the different technologies.
3. Apply IoT to different applications.
4. Analysis & evaluate protocols used in IoT.
5. Design smart city in IoT.
6. Analysis data received through sensors in IoT.

MSc-II Semester-III (Computer Science)

CCPR-305: Advanced Web Technology Lab

Lab assignments based on Advanced Web Technology Course.

MSc-II Semester-III (Computer Science)

CCPR-306: PHP Lab

Lab assignments based on PHP Course.

MSc-II Semester-III (Computer Science)

CCPR-307: Project

Course outcomes:

- 1) Gain skills as they apply knowledge effectively in diverse contexts.
- 2) Analyse and model requirements and constraints for the purpose of designing and implementing software artefacts and IT systems
- 3) Design and implement software solutions that accommodate specified requirements and constraints, based on analysis or modelling or requirements specification
- 4) Present a clear, coherent and independent exposition of software applications, alternative IT solutions, and decision recommendations to both IT and non-IT personnel via technical reports of professional standard and technical presentations.
- 5) Team work: Work effectively in different roles, to form, manage, and successfully produce outcomes from teams, whose members may have diverse cultural backgrounds and life circumstances, and differing levels of technical expertise.

MSc-II Semester-IV (Computer Science)

CCPR-401: Research Seminar

Course outcomes:

1. At the end of fourth semester student shall deliver seminar on one of the advanced topic chosen in consultation with the guide after compiling the information from the latest literature and also internet.
2. The concepts must be clearly understood and presented by student.
3. Prior to presentation, he/she shall carry out the detailed literature survey from standard references such as International & National journals and periodicals recently published reference books etc.
4. A hard copy of the report (A4 size, 12 fonts, Times New Roman, Single spacing both side printed) should be submitted to the Department before delivering the seminar.
5. This seminar will be evaluated internally for 100 marks by the respective guides.

MSc-II Semester-IV (Computer Science)

CCPR-402: Industrial / Research Project

Course outcomes:

1. Fourth semester Project work can be carried out as industrial training of four months in the Industry or in the Institute as Research project with prior permission of the Institute.
2. Project viva-voce by the University panel will be conducted at the end of semester.
3. The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation.
4. Project work may be done individually or in groups in case of bigger projects.

OR

1. The student will be allowed to formulate a proposal for start-up and the same will be rated equivalent to an industrial project. A detailed problem statement showing innovation along with markability, business plan and cash flow will be part of the Evaluation criteria.