

NOBLE WOMEN'S COLLEGE, MANJERI

Programme outcome & Course Outcome

MSc COMPUTER SCIENCE

PROGRAMME OUTCOME

- The course of the MSc (Computer Science) programme is designed with the following objectives:
- To equip students to take up challenging research oriented responsibilities and courses for their higher studies/profession.
- To train and equip the students to meet the requirements of the Software industry in the country and outside.
- To motivate and support the students to prepare and qualify challenging competitive examinations such as JRF/NET/JAM/GATE etc.

COURSE OUTCOME

SEMESTER I

CSS1C01 – DISCRETE MATHEMATICAL STRUCTURES

To introduce discrete mathematics concepts necessary to understand basic foundation of Computer Science.

CSS1C02 – ADVANCED DATA STRUCTURES

To introduce basic and advanced data structures dealing with algorithm development and problem solving.

CSS1C03 – THEORY OF COMPUTATION

To provide the students with an understanding of basic concepts in the theory of computation.

CSS1C04 – THE ART OF PROGRAMMING METHODOLOGY

- To learn the art of designing algorithms and flowcharts.
- To introduce the concept of algorithmic approach for solving real-life problems.
- To develop competencies for the design and coding of computer programs.
- To learn designing programs with advanced features of C.

CSS1C05 – COMPUTER ORGANIZATION & ARCHITECTURE

To familiarize with the digital fundamentals, computer organization, computer architecture and assembly language programming.

CSS1L01 – PRACTICAL I

To practically implement the theory portions covered in The Art of Programming Methodology (CSS1C04) and Advanced Data Structures (CSS1C02).

CSS1A01 – INTRODUCTION TO RESEARCH (ABILITY ENHANCEMENT AUDIT COURSE)

Large numbers of students are actively considering and taking up research and associated higher studies. An introductory course on research aims to introduce students to the important aspects of research. The intent of such a course is to make students aware of the details associated with formal research. By going through this introductory course on research, students are likely to be able to take up research activities in a more systematic and formal manner right from the beginning. The specific objectives of the course include:

- Understand research terminology
- Be aware of the ethical principles of research
- Identify the components of a literature review process
- Critically analyse published research
- To introduce research methods in the field of computer Science.

SEMESTER II

CSS2C06 – DESIGN AND ANALYSIS OF ALGORITHMS

- To introduce the concept of algorithmic approach for solving real-life problems.
- To teach basic principles and techniques of computational complexity.
- To familiarize with parallel algorithms and related techniques.

CSS2C07 – OPERATING SYSTEM CONCEPTS COURSE

- Introduce the underlying principles of an operating system.
- Exposure of multi programming, virtual memory and resource management concepts.
- Case study of public and commercially available operating systems.

CSS2C08 – COMPUTER NETWORKS

To provide the student with a top down approach of networking starting from the application layer.

To introduce computer networking in the back drop of Internet protocol stack.

CSS2C09 – COMPUTATIONAL INTELLIGENCE

To introduce concepts of Artificial Intelligence and Machine Learning.

CSS2C10 – PRINCIPLES OF SOFTWARE ENGINEERING

To develop familiarity with software engineering principles and practices. To have an understanding about the process of product/literature survey, techniques of problem definition, and methods of report writing.

CSS2L02 – PRACTICAL II

To practically implement the theory portions covered in the courses Operating System Concepts (CSS2C07) and Computer Networks (CSS2C08) and to extend the programming knowledge acquired through course The Art of Programming Methodology (CSS1C04).

CSS2A02 – TERM PAPER (PROFESSIONAL COMPETENCY AUDIT COURSE)

To introduce the student to the techniques of literature survey.

To acquaint him/her with the process of presenting his/her work through seminars and technical reports.

SEMESTER III

CSS3C11 – ADVANCED DATABASE MANAGEMENT SYSTEM

- To understand the relational model, and know how to translate requirements captured in an Entity-Relationship diagram into a relational schema.
- To reason about dependencies in a relational schema.
- To understand normal form schemas, and the decomposition process by which normal forms are obtained.
- To familiarize with advanced SQL' statements.
- To understand advanced features of database technologies.

CSS3C12 – OBJECT ORIENTED PROGRAMMING CONCEPTS

To learn object oriented concepts and programming concepts and methodologies and to learn its implementation using Java.

CSS3C13 – PRINCIPLES OF COMPILERS

To introduce the fundamental concepts and various phases of compiler design.

CSS3L03 – PRACTICAL III

To practically implement the theoretical aspects covered in Advanced Database Management System (CSS3C11) and Object Oriented Programming Concepts (CSS3C12) and to extend the programming knowledge acquired through The Art of Programming Methodology (CSS1C04) to encompass object oriented techniques.

CSS3E01a – COMPUTER GRAPHICS

- To understand the fundamentals of the modern computer graphics.
- To pipeline the mathematics of affine transformations in three dimensions.
- To understand the common data structures to represent and manipulate geometry, colour and light representation and manipulation in graphics systems.
- To have an exposure to programming in Open GL.

CSS3E01b – INTRODUCTION TO SOFT COMPUTING

- To give students the fundamental knowledge of soft computing theories.
- To expose the fundamentals of non-traditional technologies and approaches to solving hard real-world problems.

CSS3E01c – WEB TECHNOLOGY

To introduce the tools for creating and maintaining websites – content development (HTML), client side scripting (JavaScript), web server (Apache), server side scripting (PHP) and content management system (Joomla!).

CSS3E01d – BIOINFORMATICS

Expose students to the popular genomic and proteomic databases and to impart knowledge in processing and analysing genomic data and to introduce advanced topics in Bioinformatics.

CSS3E01e – COMPUTER OPTIMIZATION TECHNIQUES

- To give an exposure for the student to the area of modelling techniques, numerical methods and algorithms.
- To realize the importance of various aspects of optimization techniques in industries like IT.
- To implement the knowledge of optimization techniques in real life problems.

CSS3E01f – NUMERICAL AND STATISTICAL METHODS

To provide the student with basic concepts in statistics, probability that can be applied for mathematical modelling of computer applications.

CSS3E02a – PATTERN RECOGNITION

- To understand the concept of a pattern and the basic approach to the development of pattern recognition algorithms.
- To understand and apply methods for pre-processing, feature extraction, and feature selection to multivariate data.
- To understand supervised and unsupervised classification methods to detect and characterize patterns in real-world data.

CSS3E02b – WIRELESS & MOBILE NETWORKS

- To understand the fundamental concepts of wireless and mobile networks.
- To familiarize with wireless application Protocols to develop mobile content applications.
- To understand about the security aspects of wireless networks.
- To learn programming in the wireless mobile environment.

CSS3E02c – CRYPTOGRAPHY AND NETWORK SECURITY

- To be familiar with classical and modern encryption and decryption techniques and apply in the security system.
- To understand various aspects of network security standards.

CSS3E02d – ADVANCED WEB TECHNOLOGY

To introduce the advanced concepts of web development tools - Web 2.0, Web Services, Python, SQLite and MVC architecture.

CSS3E02e – VIRTUALISATION AND CLOUD COMPUTING

- Understand the technical capabilities and business benefits of virtualization and cloud computing and how to measure these benefits.
- Describe the landscape of different types of virtualization and understand the different types of clouds.
- Illustrate how key application features can be delivered on virtual infrastructures.
- Explain typical steps that lead to the successful adoption of virtualization technologies.

CSS3E02f – DATA WAREHOUSING AND DATA MINING

- To provide the fundamentals on information retrieval and data mining techniques
- To focus on practical algorithms of textual document indexing, relevance ranking, web usage mining, text analytics, as well as their performance evaluations.
- To give an exposure to the fundamentals of Data Analytics.

SEMESTER IV

CSS4P01 – PROJECT WORK

- To give a practical exposure to the process of software development life cycle.
- To develop a quality software solution by following the software engineering principles and practices. Students are also encouraged to take up a research oriented work to formulate a research problem and produce results based on its implementation/simulation/experimental analysis.

CSS4E03a – DATA COMPRESSION

- To understand the physical significance of some basic concepts of information theory including entropy, average mutual information and the rate distortion bound.
- To learn the design of entropy codes including Huffman codes and arithmetic coding.
- To understand the operation of lossless compression schemes.
- To understand the operation of popular lossy compression schemes including delta modulation, differential pulse code modulation, transform coding, and vector quantization.

CSS4E03b – PERVASIVE COMPUTING

- To provide a sound conceptual foundation in the area of Pervasive Computing aspects.
- To provide the students the ability to conceptualize, analyze and design select classes of pervasive computing systems.

CSS4E03c – SYSTEM SECURITY

To provide an understanding of the differences between various forms of computer security, where they arise, and appropriate tools to achieve them.

CSS4E03d – MOLECULAR SIMULATION AND MODELLING

- To understand application of simulation techniques to study molecular dynamics and derive properties.
- To learn and apply the statistical approaches and models for phylogenetic analysis and tree reconstruction.
- To understand the basis and nature of protein-protein interactions. To understand principles of docking simulations.

CSS4E03e – FUNDAMENTALS OF BIG DATA

- To cover the basics of big data.
- To familiarize with big data technology and tools.

CSS4E03f – WEB ENGINEERING

- To understand the concepts, principles, strategies, and methodologies of web applications development.

CSS4E04a – DIGITAL IMAGE PROCESSING

To be familiar with processing of the images, recognition of the pattern and their applications.

CSS4E04b – ADVANCED TOPICS IN DATABASE DESIGN

To study the advanced database techniques beyond the fundamental database techniques.

CSS4E04c – ADVANCED TOPICS IN DATABASE DESIGN

- Explain the key differences between development of systems to run on mobile devices and typical personal computing.
- Design effective applications for a mobile device by taking into consideration the underlying hardware-imposed restrictions such as screen size, memory size and processor capability.
- Identify potential security issues and suggest mechanisms to ensure the safety of applications on the mobile device.
- To critically analyse and communicate the differences in architecture and specialized topics such as event handling between applications on the mobile device and non-mobile platforms.

CSS4E04d – STORAGE AREA NETWORKS

- Understand Storage Area Networks (SAN) characteristics and components.
- Learn about the SAN architecture and management.
- Understand about designing and building SAN.

CSS4E04e – SEMANTIC WEB OBJECTIVES

To discover the capabilities and limitations of semantic web technology for different applications.

CSS4E04f – ADVANCED JAVA PROGRAMMING

- To learn the advanced features of Java programming language that equip the students to develop web based applications with RDBMS.