

MASTER OF COMPUTER SCIENCE

COURSE OUTCOMES2020

SEMESTER I

CSS1C01 – DISCRETE MATHEMATICAL STRUCTURES

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To introduce discrete mathematics concepts necessary to understand basic foundation of Computer Science.
CO2	To learn mathematical logic and Boolean algebra.
CO3	Ability to apply mathematical logic to solve problems.
CO4	Understand sets, relations, functions and discrete structures
CO5	Able to use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions
CO6	Able to model and solve real world problems using graphs and trees

CSS1C02 – ADVANCED DATA STRUCTURES

Contact Hours per Week: 5(3T+2L)

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To equip the students with fundamental principles of Problem Solving aspects.
CO2	To introduce basic and advanced data structures dealing with algorithm development and problem solving.
CO3	To introduce the concept of data structures
CO4	To make the students aware of various data structures
CO5	To equip the students implement fundamental data structures
CO6	Basic knowledge of data structures and programming

CSS1C03 – THEORY OF COMPUTATION

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To provide the students with an understanding of basic concepts in the theory of computation
CO2	To get a general introduction to the theory of Computer Science
CO3	To get a general understanding on different languages, grammar and automata
CO4	Basic knowledge in discrete structures and graph theory.

CSS1C04 – THE ART OF PROGRAMMING METHODOLOGY

Contact Hours per Week: 4(2T+2L)

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To learn the art of designing algorithms and flowcharts.
CO2	To introduce the concept of algorithmic approach for solving real-life problems.
CO3	To develop competencies for the design and coding of computer programs.

CSS1C05 – COMPUTER ORGANIZATION & ARCHITECTURE

Contact Hours

per Week: 4 T

Number of

Credits: 4

COs	COURSE OUTCOMES
CO1	To learn logic gates, combinational circuits and sequential circuits
CO2	To learn basics of computer organization and architecture
CO3	Learns to analyse and develop a digital logic and apply it to solve real life problems.
CO4	Understands the theory and architecture of central processing unit and learns to analyse the design issues in terms of speed, technology, cost and performance.
CO5	To familiarize with the digital fundamentals, computer organization, computer architecture and assembly language programming

CSS1L01 – PRACTICAL I

Contact Hours

per Week: 4 T

Numbers of

Credits: 2

COs	COURSE OUTCOMES
CO1	To practically implement the theory portions covered in The Art of Programming Methodology (CSS1C04) and Advanced Data Structures (CSS1C02).
CO2	To practice procedural programming concepts, learn programming environments.
CO3	To make the students equipped to solve mathematical or scientific problems using C
CO4	To learn how to implement various data structures.
CO5	To provide opportunity to students to use data structures to solve real life problems.

CSS1A01 – INTRODUCTION TO RESEARCH
(ABILITY ENHANCEMENT AUDIT COURSE)

Contact Hours
per Week: 0
Number of
Credits: 4

COs	COURSE OUTCOMES
CO1	Understand research terminology
CO2	Be aware of the ethical principles of research
CO3	Identify the components of a literature review process
CO4	Critically analyse published research
CO5	To introduce research methods in the field of computer Science

SEMESTER II
CSS2C06 – DESIGN AND ANALYSIS OF ALGORITHMS

Contact Hours
per Week: 4
Number of
Credits: 4

COs	COURSE OUTCOMES
CO1	To introduce the concept of algorithmic approach for solving real-life problems.
CO2	To teach basic principles and techniques of computational complexity.
CO3	To familiarize with parallel algorithms and related techniques

CSS2C07 – OPERATING SYSTEM CONCEPTS

Contact Hours per Week:
(3T+2L)

Number of
Credits: **4**

COs	COURSE OUTCOMES
CO1	Introduce the underlying principles of an operating system.
CO2	Exposure of multi programming, virtual memory and resource management concepts.
CO3	Case study of public and commercially available operating systems

CSS2C08 – COMPUTER NETWORKS

Contact Hours per Week: 4

Number of Credits: **4**

COs	COURSE OUTCOMES
CO1	To provide the student with a top down approach of networking starting from the application layer.
CO2	To introduce computer networking in the back drop of Internet protocol stack

CSS2C09 – COMPUTATIONAL INTELLIGENCE

Contact Hours per Week: 4

Number of Credits: **4**

COs	COURSE OUTCOMES
CO1	To introduce concepts of Artificial Intelligence and Machine Learning

CSS2C10 – PRINCIPLES OF COMPILERS

Contact Hours per Week: 4

Number of Credits: **4**

COs	COURSE OUTCOMES
CO1	To introduce the fundamental concepts and various phases of compiler design

CSS2L02 – PRACTICAL II

Contact Hours
per Week: 4 T

**Number of
Credits: 2**

COs	COURSE OUTCOMES
CO1	To practically implement the theory portions covered in the courses <i>Operating System Concepts</i> (CSS2C07) and <i>Computer Networks</i> (CSS2C08) and to extend the programming knowledge acquired through course <i>The Art of Programming Methodology</i> (CSS1C04).
CO2	To practice procedural programming concepts, learn programming environments.
CO3	To learn how to implement various protocol.

CSS2A02 – TERM PAPER
(PROFESSIONAL COMPETENCY AUDIT COURSE)

**Contact Hours per
Week: 0 Number of
Credits: 4**

COs	COURSE OUTCOMES
CO1	To introduce the student to the techniques of literature survey.
CO2	To acquaint him/her with the process of presenting his/her work through seminars and technical reports
CO3	The student is expected to do an extensive literature survey and analysis in an area related to computer science

SEMESTER III
CSS3C11 – ADVANCED DATABASE MANAGEMENT SYSTEM

**Contact Hours
per Week: 4T
Number of
Credits: 4**

COs	COURSE OUTCOMES
CO1	To understand the relational model, and know how to translate requirements captured in an Entity-Relationship diagram into a relational schema.
CO2	To reason about dependencies in a relational schema.
CO3	To understand advanced features of database technologies.
CO4	To understand normal form schemas, and the decomposition process by which normal forms are obtained.

CO5	To familiarize with advanced SQL' statements.
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CSS3C12 – OBJECT ORIENTED PROGRAMMING CONCEPTS

Contact Hours per Week: 5 (3T + 2L)

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To learn the basics of JAVA
CO2	To learn object oriented concepts and programming concepts and methodologies and to learn its implementation using Java.

CSS3C13 – PRINCIPLES OF SOFTWARE ENGINEERING

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To develop familiarity with software engineering principles and practices.
CO2	To have an understanding about the process of product/literature survey, techniques of problem definition, and methods of report writing.

CSS3L03 – PRACTICAL III

**Contact Hours per
Week: 4 T Number
of Credits: 2**

COs	COURSE OUTCOMES
CO1	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
CO2	To practice procedural programming concepts, learn programming environments.
CO3	To learn how to implement RDBMS

CSS3E01a – COMPUTER GRAPHICS

Contact Hours per Week:

4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To understand the fundamentals of the modern computer graphics.
CO2	To pipeline the mathematics of affine transformations in three dimensions.
CO3	To understand the common data structures to represent and manipulate geometry, colour and light representation and manipulation in graphics systems.
CO4	To have an exposure to programming in OpenGL.

CSS3E01b – INTRODUCTION TO SOFT COMPUTING

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To give students the fundamental knowledge of soft computing theories.
CO2	To expose the fundamentals of non-traditional technologies and approaches to solving hard real-world problems.

CSS3E01c – WEB TECHNOLOGY

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	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

Contact Hours per Week: 4T

Number of Credits: 4

COs	COURSE OUTCOMES
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CO1	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.
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CSS3E01e – COMPUTER OPTIMIZATION TECHNIQUES

Contact Hours per

Week: 4 Number of

Credits: 4

COs	COURSE OUTCOMES
CO1	To give an exposure for the student to the area of modelling techniques, numerical methods and algorithms.
CO2	To realize the importance of various aspects of optimization techniques in industries like IT.
CO3	To implement the knowledge of optimization techniques in real life problems

CSS3E01f – NUMERICAL AND STATISTICAL METHODS

Contact Hours per

Week: 4 T

Number of

Credits: 4

COs	COURSE OUTCOMES
CO1	To provide the student with basic concepts in statistics, probability that can be applied for mathematical modelling of computer applications.

CSS3E02a – PATTERN RECOGNITION

Contact Hours per

Week: 4 T Number

of Credits: 4

COs	COURSE OUTCOMES
CO1	To understand the concept of a pattern and the basic approach to the development of pattern recognition algorithms.
CO2	To understand and apply methods for pre-processing, feature extraction, and feature selection to multivariate data.
CO3	To understand supervised and unsupervised classification methods to detect and characterize patterns in real-world data

CSS3E02b – WIRELESS & MOBILE NETWORKS

Contact Hours per Week: 4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To understand the fundamental concepts of wireless and mobile networks.
CO2	To familiarize with wireless application Protocols to develop mobile content applications.
CO3	To understand about the security aspects of wireless networks.
CO4	To learn programming in the wireless mobile environment.

CSS3E02c – CRYPTOGRAPHY AND NETWORK SECURITY

Contact Hours per Week:

4

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To be familiar with classical and modern encryption and decryption techniques and apply in the security system.
CO2	To understand various aspects of network security standards.

CSS3E02d – ADVANCED WEB TECHNOLOGY

Contact Hours per Week:

4T

Number of Credits: 4

COs	COURSE OUTCOMES
CO1	To introduce the advanced concepts of web development tools - Web 2.0, Web Services, Python, SQLite and MVC architecture

CSS3E02e – VIRTUALISATION AND CLOUD COMPUTING

Contact Hours per

Week: 4 T

Number of

Credits: 4

COs	COURSE OUTCOMES
CO1	Understand the technical capabilities and business benefits of virtualization and cloud computing and how to measure these benefits.

CO2	Describe the landscape of different types of virtualization and understand the different types of clouds.
CO3	Illustrate how key application features can be delivered on virtual infrastructures.
CO4	Explain typical steps that lead to the successful adoption of virtualization technologies.

CSS3E02f – DATA WAREHOUSING AND DATA MINING

Contact Hours per Week: 4

Number of credits: 4

COs	COURSE OUTCOMES
CO1	To provide the fundamentals on information retrieval and data mining techniques
CO2	To focus on practical algorithms of textual document indexing, relevance ranking, web usage mining, text analytics, as well as their performance evaluations.
CO3	To give an exposure to the fundamentals of Data Analytics

SEMESTER IV

CSS4P01 – PROJECT WORK

Number of
Credits: 8

Contact Hours per Week: 15

COs	COURSE OUTCOMES
CO1	To give a practical exposure to the process of software development life cycle.
CO2	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.
CO3	To give a practical exposure to the process of software development life cycle.

CSS4E03a – DATA COMPRESSION

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
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CO1	To understand the physical significance of some basic concepts of information theory including entropy, average mutual information and the rate distortion bound.
CO2	To learn the design of entropy codes including Huffman codes and arithmetic coding.
CO3	To understand the operation of lossless compression schemes.
CO4	To understand the operation of popular lossy compression schemes including delta modulation, differential pulse code modulation, transform coding, and vector quantization

CSS4E03b – PERVASIVE COMPUTING

Contact Hours per Week: 5

Number of Credits: 3

COs	COURSE OUTCOMES
CO1	To provide a sound conceptual foundation in the area of Pervasive Computing aspects.
CO2	To provide the students the ability to conceptualize, analyze and design select classes of pervasive computing systems.

CSS4E03c – SYSTEM SECURITY

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	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

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	To understand application of simulation techniques to study molecular dynamics and derive properties.
CO2	To learn and apply the statistical approaches and models for phylogenetic analysis and tree reconstruction.
CO3	To understand the basis and nature of protein-protein interactions.
CO4	To understand principles of docking simulations.

CSS4E03e – FUNDAMENTALS OF BIG DATA

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
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CO1	To cover the basics of big data.
CO2	To familiarize with big data technology and tools.

CSS4E03f – WEB ENGINEERING

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	To understand the concepts, principles, strategies, and methodologies of web applications development.

CSS4E04a – DIGITAL IMAGE PROCESSING

Number of
Credits: 3

Contact Hours per Week:5

COs	COURSE OUTCOMES
CO1	To be familiar with processing of the images, recognition of the pattern and their applications.

CSS4E04b – ADVANCED TOPICS IN DATABASE DESIGN

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	To study the advanced database techniques beyond the fundamental database techniques

CSS4E04c – SOFTWARE DEVELOPMENT FOR PORTABLE DEVICES

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	Explain the key differences between development of systems to run on mobile devices and typical personal computing.
CO2	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
CO3	Identify potential security issues and suggest mechanisms to ensure the safety of application on the mobile device
CO4	To critically analyse and communicate in the difference in architecture and specialised topics

CSS4E04d – STORAGE AREA NETWORKS

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	Understand Storage Area Networks (SAN) characteristics and components.
CO2	Learn about the SAN architecture and management.
CO3	Understand about designing and building SAN

CSS4E04e – SEMANTIC WEB

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	To discover the capabilities and limitations of semantic web technology for different applications..

CSS4E04f – ADVANCED JAVA PROGRAMMING

Number of
Credits: 3

Contact Hours per Week: 5

COs	COURSE OUTCOMES
CO1	To learn the advanced features of Java programming language that equip the students to develop web based applications with RDBMS