DEPARTMENT OF COMPUTER SCIENCE (UG)

Name of the Programme: B.Sc. Computer Science (H) (Under CBCS)

Year of Introduction: 2018

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO 1: Demonstrate the aptitude of Computer Programming and Computer based problem-solving skills.

PSO 2: Display the knowledge of appropriate theory, practices and tools for the specification, design, and implementation.

PSO 3: Ability to link knowledge of Computer Science with other two chosen auxiliary disciplines of study.

PSO 4: Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.

PSO 5: Ability to appreciate emerging technologies and tools.

PSO 6: Apply standard Software Engineering practices and strategies in real-time software project development.

COURSE OUTCOMES (CO)

A. CORE COURSES (6 credits per week)

Semester-1:

CMSA-CC-1 (Digital Logic)

- ➢ **CO1:** To know about the basic building blocks of computer system.
- ➢ **CO2:** Boolean algebra and Boolean function representation.
- ➢ **CO3:** Learn about different logic families.

CMSA-CC-2 (Programming Fundamentals Using C)

- ➢ **CO1:** Develop problem-solving skills coupled with top down design principles.
- ➢ **CO2:** Learn about the strategies of writing efficient and well-structured computer programs.

Semester-2:

CMSA-CC-3 (Data Structure)

- ➢ **CO1:** To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
- ➢ **CO2:** Ability to choose a data structure to suitably model any data used in computer applications.
- ➢ **CO3:** Ability to assess efficiency tradeoffs among different data structure implementations.

CMSA-CC-4 (Basic Electronic Devices and Circuits)

> **CO1:** To familiarize students with different building components of Integrated circuits like Diode, Zener Diode, and Transistor etc.
> **CO2:** Ability to know the logic of different electronic circuits.

Semester-3:

CMSA-CC-5 (Computer Organization & Architecture)

> **CO1:** To make students understand the basic structure, operation and characteristics of digital computer.
> **CO2:** To familiarize the students with hierarchical memory system including cache memories and virtual memory.
> **CO3:** To make students know the different ways of communicating with I/O devices and standard I/O interfaces.

CMSA-CC-6 (Computational Mathematics)

> **CO1:** Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking and be able to apply them in problem solving.
> **CO2:** Understand the basics of combinatorics, and be able to apply the methods from these subjects in problem solving.
> **CO3:** Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.

CMSA-CC- 7 (Operating System)

> **CO1:** Describe the important computer system resources and the role of operating system in their management policies and algorithms.
> **CO2:** Understanding of design issues associated with operating systems.
> **CO3:** To understand concepts of memory management including virtual memory.

Semester-4:

CMSA-CC-8 (Data Communication, Networking and Internet Technology)

> **CO1:** Understand the structure of Data Communications System and its components.
> **CO2:** Know the layered model approach explained in OSI and TCP/IP network models
> **CO3:** Identify different types of network devices and their functions within a network.

CMSA-CC-9 (Introduction to Algorithm & its Applications)

> **CO1:** To learn good principles of algorithm design
> **CO2:** To learn how to analyze algorithms and estimate their various time complexities.

CMSA-CC- 10 (Microprocessor and Its Application)

> **CO1:** Learn about assembly language programming.
> **CO2:** To make the students understand detailed architecture of microprocessor and its flow of control.
> **CO3:** Develop concept of interfacing external devices with microprocessor.

Semester-5:

CMSA-CC- 11 (Database Management System)

- ➤ **CO1:** Gain knowledge of database systems and database management systems software.
- ➤ **CO2:** Ability to model data in applications using conceptual modelling tools such as ER Diagrams and design data base schemas based on the model.
- ➤ **CO3:** Formulate, using SQL, solutions to a broad range of query and data update problems.

CMSA-CC- 12 (Object Oriented Programming)

- ➤ **CO1:** Learn the concepts of data, abstraction and encapsulation
- ➤ **CO2:** Be able to write programs using classes and objects, packages.
- ➤ **CO3:** Understand conceptually principles of Inheritance and Polymorphism and their use and program level implementation.

Semester-6:

CMSA-CC- 13 (Software Engineering)

- ➤ **CO1:** Basic knowledge and understanding of the analysis and design of complex systems.
- ➤ **CO2:** Ability to apply software engineering principles and techniques.
- ➤ **CO3:** To produce efficient, reliable, robust and cost-effective software solutions.

CMSA-CC- 14 (Theory of Computation)

- ➤ **CO1:** To provide a formal connection between algorithmic problem solving and the theory oflanguages and automata and develop them into a mathematical (abstract) view towards algorithmic design and in general computation itself.
- ➤ **CO2:** Become proficient in key topics of theory of computation, and to have the opportunity toexplore the current topics in this area.

B. DISCIPLINE SPECIFIC ELECTIVES (DSE) (6 credits per week)

CMSA-DSE-A-1 (Digital Image Processing)

- ➤ **CO1:** To familiarize the students with the image fundamentals and mathematical transforms necessaryfor image processing.
- ➤ **CO2:** To make the students understand the image enhancement techniques.
- ➤ **CO3:** To familiarize the students with the image segmentation procedures.

CMSA-DSE-B-1 (Operation Research)

- ➤ **CO1:** To familiarize the students with the applications of O.R.
- ➤ **CO2:** Learn about Linear Programming Problem, Simplex method, Assignment and Transportation problems and their applications.
- ➤ **CO3:** To make the students understand the effectiveness of O.R in business productions for optimal decision-making.

CMSA-DSE-A-2 (Multimedia and its Application)

➢ **CO1:** To familiarize the students with the broad practical applications of multimedia.
➢ **CO2:** Learn about various softwares and hardwares used in multimedia.
➢ **CO3:** Develop basic multimedia projects using multimedia softwares

CMSA-DSE-B-4 (Introduction to Computational Intelligence)

➢ **CO1:** Identify problems that are amenable to solution by AI methods, and which AI methods may besuited to solving a given problem.
➢ **CO2:** Implement basic AI algorithms (e.g., standard search or constraint propagation algorithms).
➢ **CO3:** Differentiate between supervised, unsupervised machine learning approaches.

C. SKILL ENHANCEMENT COURSES (SEC) (2 credits per week)

CMSA-SEC-A-1 (Computer Graphics)

➢ **CO1:** Acquire familiarity with the concepts and relevant mathematics of computer graphics.
➢ **CO2:** Ability to implement various algorithms to scan, convert the basic geometrical primitives,transformations, area filling, clipping.
➢ **CO3:** Be able to design applications that display graphic images to given specifications.

CMSA-SEC-B-1 (Information Security)

➢ **CO1:** Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
➢ **CO2:** Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
➢ **CO3:** Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

D. GENERIC ELECTIVES (GE)

Semester-1:

CMSG-CC-1-Th (Computer Fundamentals and Digital Logic Design)

➢ **CO1:** To familiarize students about the basic fundamental design and building blocks of computer system.
➢ **CO2:** Learn the Boolean logic and circuit design.
➢ **CO3:** Learn about different Combinational and Sequential Logic circuits and their functionalities.

CMSG-CC-1-Pr (Word Processing, Spreadsheet, Presentation and Web Design by HTML)

➢ **CO1:** To familiarize Student about the office package (Word, Excel, and PowerPoint Presentation in opensource environment.
➢ **CO2:** Learn the webpage design using HTML

Semester-2:

CMSG-CC-2-Th (Algorithm and Data Structure)

- ➢ **CO1:** To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
- ➢ **CO2:** Ability to choose a data structure to suitably model any data used in computer applications.

CMSG-CC-2-Pr (Programming with C)

- ➢ **CO1:** Learn about the strategies of writing efficient and well-structured computer programs.
- ➢ **CO2:** Develop the skills for formulating iterative solutions to a problem.

Semester-3:

CMSG-CC- 3-Th (Computer Organization)

- ➢ **CO1:** To familiarize the students with arithmetic and logic unit as well as the concept of the concept of pipelining.
- ➢ **CO2:** To familiarize the students with hierarchical memory system including cache memories andvirtual memory.
- ➢ **CO3:** To make students know the different ways of communicating with I/O devices and standard I/Ointerfaces.

CMSG-CC-3-Pr (Programming using Python)

- ➢ **CO1:** To familiarize the students with object oriented programming and procedure oriented programming.
- ➢ **CO2:** To familiarize the students with nowadays very much popularity of the software especially in IT base companies for web application, database handling etc.

Semester-4:

CMSG-CC-4-Th (Operating System)

- ➢ **CO1:** Describe the important computer system resources and the role of operating system in theirmanagement policies and algorithms.
- ➢ **CO2:** Understanding of design issues associated with operating systems.

CMSG-CC-4-Pr (Shell Programming)

- ➢ **CO1:** To learn the command substitution to capture program output.
- ➢ **CO2:** To learn the conditional statements to control the execution of shell scripts