B.Sc. Computer Science Honours

6 Semester Course

List of Courses

Sl No	Name of the Course	Semester	Course Code	Credit	Marks in the Course	Name of the Programme	Programme Code	Course outcome	Activities with direct bearing on employbility	Introdcution year of new course	BoS Date	Percentage of Revision	BoS Date
1	Computer Fundamentals, Computer Architecture and Organization	1	CMSA P1T	10	75	B.Sc Computer Science Honours	CMSA	i) Able to develop algorithms for mathematical and scientific problems. ii) To impart the basic concepts of digital computers. iii) Able to analyse the designing process of combinational and sequential circuits iv) Identify different input output devices and the control circuit. v) Able to understand the design and implementation of ALU and CU.	In this course, students are involved in basic computer literacy considered as base of the said programme which helps them to enter in administration and similar job fields, hence during class assignements and different logical problem are given to make better understandings regarding subject.			25	02.07.2015

2	Digital Laboratory, C Programming Laboratory	1	CMSA P1P	4	25	B.Sc Computer Science Honours	CMSA	i) Identify the strength and limitations of theoretical models and establish a relationship between measured data and underlying physical principles. ii) Specify appropriate equipment and procedures, implement these procedures, analyse and interpret the resulting data. iii) Design and build a software/hardware part to meet desired specifications and tests it using appropriate testing strategy and/or equipments. iv) Illustrate flowchart and algorithm for a given problem v) Inscribe C programs using operator, array, pointer, string, function, structure, file-handling operations etc.	In this course students are given different hands-on experiment regarding operational paradigm of computer hardware, which helps to build the basis to become a computer hardware engineer, also students are asked in class to solve assignments to learn the basic building blocks of writing and developing the software programs, which in turn helps them to acquire the position in IT industry for software development.				

3	Data Structure-I, Numerical Analysis and Operational Research	2	CMSA P2T	10	75	B.Sc Computer Science Honours	CMSA	i) Interpret and compute asymptotic notations of an algorithm to analyze the consumption of resources (time/space). ii) Exemplify and implement stack, queue and list ADT to manage the memory using static and dynamic allocations. iii) Develop and compare the comparison-based search algorithms and sorting algorithms. iv) Identify appropriate data structure and algorithm for a given contextual problem and develop in C. v) Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. vi) Apply numerical methods to obtain approximate solutions to mathematical	In this course students are given assignemnts in the form of small project to develop logic and structure of a logical problem. Such approach helps them to develop logic for software development in IT industry. Hereafter students have to face sudden test based on different approaches in computational mathematics, which in turn helps them to face the challenge to design the basic blocks of optimized and sophisticated application laboratory.				

4	Data Structure-I, Numerical Analysis (Lab)	2	CMSA P2P	4	25	B.Sc Computer Science Honours	CMSA	i) Interpret and compute asymptotic notations of an algorithm to analyze the consumption of resources (time/space). ii) Exemplify and implement stack, queue and list ADT to manage the memory using static and dynamic allocations. iii) Develop and compare the comparison-based search algorithms and sorting algorithms. iv) Identify appropriate data structure and algorithm for a given contextual problem and develop in C. v) Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. vi) Apply numerical methods to obtain approximate solutions to mathematical	In this course studnets are taught different software tools through assignements and presentation to implement different approaches in computational mathematics paradigm. It helps them to implement basic building blocks of optimized and sophisticated application in softawre industry. Also sudden qualitative tests are taken to teach them instant implementation of logic and structure of a logical problem using programming laguages, which in turn helps them in future to implement different modules of a softawre in IT related industries.				

5	Discrete Mathematics, Graph Theory, Object Oriented Programming, Data Structure-II	3	CMSA P3T	10	75	B.Sc Computer Science Honours	CMSA	i) Able to construct simple mathematical proofs and possess the ability to verify them. ii) Achieve substantial experience to comprehend formal logical arguments iii) Be skilful in expressing mathematical properties formally via the formal language of propositional logic and predicate logic iv) Be able to specify and manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess v) Acquire ability to describe computer programs (e.g. recursive functions) in a formal mathematical manner vi) Be able to apply basic counting techniques to solve combinatorial problems	In this course assignments and real-life examples are considered as teaching aids to teach different computational mathematical approach which helps the students to be data analytics, research analytics. Different presentation of new applications related to data science, data analysis, statistics engineering etc are also shown them. Guidance through different programming tools help them to learn the basic building blocks of writing and developing the OOP software programs.			25	02.07.2015

6	Discrete Mathematics, Graph Theory, Object Oriented Programming, Data Structure-II (Lab)	3	CMSA P3P	4	25	B.Sc Computer Science Honours	CMSA	i) Able to construct simple mathematical proofs and possess the ability to verify them. ii) Achieve substantial experience to comprehend formal logical arguments iii) Be skilful in expressing mathematical properties formally via the formal language of propositional logic and predicate logic iv) Be able to specify and manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess v) Acquire ability to describe computer programs (e.g. recursive functions) in a formal mathematical manner vi) Be able to apply basic counting techniques to solve combinatorial problems	In this course different assignments and small project works are given as well as they are asked to give presentation on some relevant topics, to be more familiar regarding the course. It helps them to infer the knowledge for future working paradigm.			10	02.07.2015

7	System Software & Operating System, Formal Language and Automata Theory, Design and Analysis of Algorithm	4	CMSA P4T	10	75	B.Sc Computer Science Honours	CMSA	i) Describe the important computer system resources and the role of operating system in their management policies and algorithms. ii) Understand the process management policies and scheduling of processes by CPU iii) Describe and analyze the memory management and its allocation policies. iv) Identify use and evaluate the storage management policies with respect to different storage management technologies. v) Define languages by abstract, recursive definitions and by regular expressions. vi) Design a finite automaton to recognize a given regular language. vii) Define deterministic and nondeterministic finite automata. viii) Define relationship	In this course different case studies are provided for outer and inner look of operating system to become technician in bussiness applications. Case studies on different scenario in automation industry are also discussed to build the basis of working globally with automakers, suppliers, and technology companies that are developing automation mechanism. It also helps to work in the domain of AI and machine learning.			30	02.07.2015

8	System Software & Operating System, Formal Language and Automata Theory, Design and Analysis of Algorithm	4	CMSA P4P	4	25	B.Sc Computer Science Honours	CMSA	i) Describe the important computer system resources and the role of operating system in their management policies and algorithms. ii) Understand the process management policies and scheduling of processes by CPU iii) Describe and analyze the memory management and its allocation policies. iv) Identify use and evaluate the storage management policies with respect to different storage management technologies. v) Define languages by abstract, recursive definitions and by regular expressions. vi) Design a finite automaton to recognize a given regular language. vii) Define deterministic and nondeterministic finite automata. viii) Define relationship	Uses of different software tools in the paradigm of automation based on different operating systems are taught them to get the flavour of real-life applications of computation world.				

9	Database Management System, Microprocessor , Software Engineering	5	CMSA P5T	13	100	B.Sc Computer Science Honours	CMSA	i) Ability to define a problem at the view level & ability to understand the physical structure of the database to handle data. ii) Students would be able to implement the logic by using tools like ERD. iii) Ability to normalize the database & understand the internal data structure. iv) Students would clearly understand the transaction system &could extract data efficiently. v) Describe the general architecture of a microcomputer system and architecture &organization of 8085 & 8086 Microprocessor and understand the difference between 8085 and advanced microprocessor. vi) Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor	In this course students are provided several real-life alike query handling system. Presentation on the application and uses of search engines. Also the optimization techniques of the machine dependent instructions through microprocessors. Altogether these help the students to be system admin, query handler, performance optimizer of computation system in future.				

10	Database Management Laboratory, Assembly Language Programming and I/O Interfacing, GUI Development Laboratory	5	CMSA P6P	13	100	B.Sc Computer Science Honours	CMSA	) Develop students' understanding through laboratory activities to solve problems related to key concepts taught in the classroom. ii) Develop students' ability to solve open ended problems through the design and construction of new artifacts or processes. iii) Develop debugging capability in order to propose and apply effective engineering solutions. Procedures/algorithms analyze and interpret theresulting data.	In this course assignments and class test on the basis of current on-going system enhancement policies are arranged. Students are asked to share their view regarding new query application, development of H/W architecture through presenation etc. Thus they become familiar about current trends in on going market.				

11	Graphics and Multimedia, Computer Networking, Data Communication and Internet Technology	6	CMSA P7T	13	100	B.Sc Computer Science Honours	CMSA	i)Understand Raster graphics, vector graphics and various graphics I/O devices. ii) To develop mathematical models for representing various objects (both regular and irregular) in computer. iii) To understand effects of colour, lighting, shading etc. on modelled objects/scenes to make it realistic. iv) To obtain various operators for performing various affine transformation operations. v) To build strong foundation to study advanced courses like Image Processing, Pattern Recognition and research work. vi) Analyse the concepts of networks, types and architectures and identify error free transmission of data and analyse data	In this course small projects and assignments are given them. Hey are asked to present some reports on the existing applications. Thus the learning about existing concepts become little bit easier.			20	02.01.2015

12	Network Programming, Web Programming, Project Work	6	CMSA P8P	13	100	B.Sc Computer Science Honours	CMSA	protocols which supports the Internet ii) Able to use common programming interfaces for network communication iii) Acquire the knowledge of TCP/UDP sockets iv) Create applications using techniques such as multiplexing, forking, multithreading etc. v) Acquire knowledge of UNIX/LINUX OS to build client-server applications. vi) Learn the basics of HTML5 vii) Build the foundation of front-end design viii) Learn client-side programming in Javascript ix) Able to produce solutions that meet specified needs with consideration public health, safety, and welfare as well as global, cultural, social, environmental and economic factors.	In this course different existing real-life problems based on their gained knowledge from prior course are implemented. It helps them to use their inherent knowledge with the acquired knowledge to flourish their thinking, which in turn helps them to cope up as fast as possible with the challenging scenario of S/W industry.			25	02.01.2015
13	Number System & Boolean Algebra Basic Building Blocks of Computer and Their Implementation	1	CMSGP1T	2	75	B.Sc Computer Science Honours	CMSA	i) Creating fundamental background of computer science. ii) Building up fundamental concepts of digital logic design and Boolean algebra.	In this course though assignments and presentation on the course topics students learn basic idea of the course which in turn helps them to acquire positions in basic job market in computation industry.			33	11.12.2015

14	C Programming -I	1	CMSGP1P	1	25	B.Sc Computer Science Honours	CMSA	i) Introduction to programming language using C.	In this course students are taught through programming tools and practical assignments which helps them to know how to develop the programming architecture. Thus it helps them to work in S/W development industry in future.				
15	Algorithms & Data Structure Operating System	2	CMSGP2T	2	50	B.Sc Computer Science Honours	CMSA	i) Creating fundamental background data structure and algorithm. ii) Building up concepts of theory of operating system design.	Students are taught through the assignemnts and discussion on the working principle of OS through presentation. It helps them to make their footprints in IT industry.				
16	C Programming -II	2	CMSGP2P	1	25	B.Sc Computer Science Honours	CMSA	i) Implementation of data structures and other algorithm using C.	In this course students are taught advanced level of the programming language through different practical assignments and presentation, thus they become familiar how to develop logic and applications through programming.				

17	Database Management System Cryptography	3	CMSGP3T	2	50	B.Sc Computer Science Honours	CMSA	i) Creating fundamental background database management systems. ii) Implementing theory of RDBMS using SQL package. iii) Building mathematical background and theoretical knowledge of cryptography.	In this course students are taught by considering the examples of some real-life on going query management system which helps them to make better understanding of the query exection. Thus it helps them to become system administrator in future in different application domain.	2016-17	11.12.2015		
18	Database Lab	3	CMSGP3P	1	25	B.Sc Computer Science Honours	CMSA	The student should be familiar with at least one standard commercial RDBMS software under desktop or multiuser environment	Practical approaches of the theoretical applications are taught through different query execution tools which enrich them for better understading of different existing real-life applications.				

19	Computer Network and Internet Technologies Graph Theory	4	CMSGP4T	2	50	B.Sc Computer Science Honours	CMSA	i) Creating fundamental background of theory of networking. ii) Introducing the science behind Internet and its technologies. iii) Building up background for graph theoretical approach.	In this course students are taught by mentioning the examples of different network protocols through presentation and they are also asked to solve assignemnts, which in turn helps them to be familiar with the working activity of networking. It helps them to understand the data communication system in IT industry.				
20	Python Programming	4	CMSGP4P	1	25	B.Sc Computer Science Honours	CMSA	Introducing students to scripting language using Python.	In this course students get introduced to flavor of scripting language through Python scripting. In Python scripting they gets used to using several mathematical and scientific packages like numpy, mathplotlib. This helps them in building solutions for scientific problems in respective domain.	2016-17	11.12.2015		

21	Circuit components and network Physics of semiconductor devices	1	ELTGP1T	2	50	B.Sc Computer Science Honours	CMSA	i) Ability to study and identify various circuit elements and electronic devices. ii) Ability to study and analyze different circuits and networks. iii) Ability to obtain theoretical knowledge of construction and characteristics of various electronics devices and also to have the idea of working of those devices.	Studnets are taught through basic texts and class assignments. Also they are given assignments so that they they gets accoustomed to witing technical content or papers. This method helps them building technical paper writing skills.			55	10.08.2017
22	Circuit Theory and Study of Junction Diode & Transistors	1	ELTGP1P	1	25	B.Sc Computer Science Honours	CMSA	Ability to design and study circuits based on those devices and motivate the students to do hands on experiments in the laboratory.	Students are first introduced to basics of electronics experimental devices. They are given assignments on analog electronics so that they gets an idea on how to work with eqipments of analog elctronics. This shold help them to achieve experimental exposure in basic electonics.			44	10.08.2017

23	Transistor circuit – Design and applications Analog integrated circuits – OPAMP and Timer chip:	2	ELTGP2T	2	50	B.Sc Computer Science Honours	CMSA	i) Ability to study and identify transistors. ii) Ability to implement practical experiments of transistors. iii) Understanding Operational Amplifier and its applications.	Transistors are OP AMPs are inherent part of study of electronics. Student are taught theory of these devices through use case senarios along with the basics. They gets an idea on useability of these.			57	10.08.2017
24	Applications of BJT and Analog IC OPAMP & IC 555.	2	ELTGP2P	1	25	B.Sc Computer Science Honours	CMSA	Understanding the practical modern application of electronics and related field through industry visit.	The industry visit is one of the highlights of the course. They visit institutions like VECC and by guided visit, they acquire immense knowledge of the current search and applications of electronics and relevent domain. Also in practical they need to complete assignments on OP AMPs and transistors.			44	10.08.2017
25	Electronic Instrumentation IC Design Technology	3	ELTGP3T	2	50	B.Sc Computer Science Honours	CMSA	Ability to identify Integrated Circuits (ICs) and study their characteristics.	During the course students are provided with class assignments on ICs. Also they are required to submit reports on pactical uses of IC.			65	10.08.2017

26	Simulations with Hardware & Circuit Description Languages	3	ELTGP3P	1	25	B.Sc Computer Science Honours	CMSA	To impart the basic concepts of Analog ICs such as Operational Amplifier (OPAMP) and Timer Chip (IC 555), with hands-on experiments using them in the laboratory. Understanding CRO with hands on experiments.	Use cases of CRO is a important aspect of this laboratory. Students are required to generate various waveforms on various functions and study them using CRO			50	10.08.2017
27	Digital Communication and Communication Technology : Optoelectronics and Display Devices:	4	ELTP4T	2	50	B.Sc Computer Science Honours	CMSA	i) Ability to understand basics of communication. ii) Ability to understand basics of optics.	Students are given mthematical assignmets and thory assignmets related to basics of communiction technology.			57	10.08.2017
28	Project Work	4	ELTGP4P	1	25	B.Sc Computer Science Honours	CMSA	Experience of hands on electronics project.	Through the project students try to implement their basic knowledge of electronics implementing a project. Students try to implement utility devices or automated circuits.				

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