

## M.Sc COMPUTER SCIENCE COURSE OUTCOMES

S.NO	COURSE NAME	COURSE CODE	COURSE OUTCOME
1	Artificial Intelligence	MSCS1.1	<p>CO1:Design user interfaces to improve human–AI interaction and real-time decision-making.</p> <p>CO2:Evaluate the advantages, disadvantages, challenges, and ramifications of human–AI augmentation.</p> <p>CO3:Design and develop symbiotic human–AI systems that balance the information processing power of computational systems with human intelligence and decision making.</p> <p>CO4:Explain the benefits, limitations, and tradeoffs of designing engaging and ethical conversational user interactions, including those supported by chatbots, smart speakers, and other AI-driven, voice-based technologies.</p> <p>CO5:Design and evaluate conversational interfaces for different users and contexts of use.</p>
2	Data Structures &Algorithms Using C++	MSCS1.2	<p>CO1:Acquire some basic mathematical tools and techniques of algorithm analysis.</p> <p>CO2:To familiarise with basic data structures and to develop the ability to choose the appropriate data structure for designing efficient algorithms.</p> <p>CO3:Learn some basic algorithms with their rigorous proofs of correctness and efficiency analysis of implementation using appropriate data structures.</p> <p>CO4:To know about some basic data structures, their implementation and some of their standard applications.</p> <p>CO5:To develop the ability to analyze the running time and prove the correctness of basic algorithms.</p> <p>CO6:To develop the ability to design and analyze simple algorithms using the appropriate data structure learned in the course.</p>

3	Computer Organization & Architecture	MSCS1.3	<p>CO1:Understanding the registers and micro operations</p> <p>CO2:Learn about basic computer organization and its design</p> <p>CO3:Ability to know the micro programmed control</p> <p>CO4: Understand the architecture and functionality of central processing unit.</p> <p>CO5: Understanding the input and output organization concepts like Asynchronous data transfer,DMA,modes off transfer etc</p> <p>CO6: Exemplify in a better way the I/O and memory organization</p> <p>CO7: The students will be able to demonstrate the over view of computer architecture</p>
4	Object oriented Programming using JAVA	MSCS1.4	<p>CO1:Constructs loops in Java.</p> <p>CO2:Defines arrays in Java and uses them.</p> <p>CO3:Declares objects and classes.</p> <p>CO4:Distinguishes classes and objects.</p> <p>CO5:Declares and uses variables.</p> <p>CO6:Declares and uses methods and properties.</p> <p>CO7:Explains and uses encapsulation.</p> <p>CO8:Explains and uses inheritance.</p> <p>CO9:Explains and uses polymorphism.</p>
5	Database Management Systems	MSCS1.5	<p>CO1:Describe the fundamental elements of relational database management systems</p> <p>CO2:Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.</p> <p>CO3:Design ER-models to represent simple database application scenarios</p> <p>CO4:Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.</p> <p>CO5: Improve the database design by normalization.</p> <p>CO6:Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.</p>
6	Data Structures & Algorithms Lab using C++/JAVA	MSCS1.6	<p>CO1:Able to identify the appropriate data structures and algorithms for solving real world problems.</p> <p>CO2: Able to implement various kinds of searching and sorting techniques.</p> <p>CO3:Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.</p>
7	Computer Organization LAB	MSCS1.7	<p>CO1:Digital logic design experiments</p> <p>CO2:Understanding assembly language programming</p>

8	Database Management Systems Lab	MSCS1.8	<p>CO1:Ability to design and implement a database schema for given problem.</p> <p>CO2: Apply the normalization techniques for development of application software to realistic problems.</p> <p>CO3: Ability to formulate queries using SQL DML/DDL/DCL commands.</p>
9	Formal Languages & Automata Theory	MSCS2.1	<p>CO1:Knowledge Acquire a full understanding and mentality of Automata Theory as the basis of all computer science languages design - Have a clear understanding of the Automata theory concepts such as RE's, DFA's, NFA's, Turing machines, Grammar, halting problem, computability and complexity.</p> <p>CO2: Cognitive skills (thinking and analysis). - Be able to design FAs, NFAs, Grammars, languages modelling, small compilers basics - Be able to design sample automata - Be able to minimize FA's and Grammars of Context Free Languages.</p> <p>CO3:Professional Skill - Perceive the power and limitation of a computer - Solve the problems using formal language</p> <p>CO4: Attitude- Develop a view on the importance of computational theory</p>
10	Datawarehouse & Data Mining	MSCS2.2	<p>CO1:Understand the functionality of the various data mining and data warehousing component Knowledge, Understand</p> <p>CO2 :Appreciate the strengths and limitations of various data mining and data warehousing models Apply, Create</p> <p>CO3: Explain the analyzing techniques of various data Analyze</p> <p>CO 4: Describe different methodologies used in data mining and data ware housing. Analyze</p> <p>CO5:Compare different approaches of data ware housing and data mining with various technologies.</p>

11	Data Communications & Computer Networks	MSCS2.3	<p>CO1:Understand the concept of Signals, OSI &amp; TCP/IP reference models and functionalities of each layer in these models.</p> <p>CO2:Apply flow control and error control mechanisms using data link layer protocols.</p> <p>CO3:Apply the concepts of various routing algorithms and IP addresses to fulfil network requirements of an organization.</p> <p>CO4:Determine the model of reliable/unreliable communication using various Transport Layer Protocols (UDP, TCP).</p> <p>CO5:Analyse the features and operations of various application layer protocols such as HTTP, DNS and SMTP</p>
12	Internet of things	MSCS2.4	<p>CO1:Defining and explaining the "Internet of Things" concept and its applications in different contexts.</p> <p>CO2:Identifying the key components of an IoT system, including sensors, actuators, gateways, and cloud platforms.</p> <p>CO3:Understanding the different layers of the IoT stack (device, network, application) and relevant protocols at each layer.</p>
13	Elective I Embedded Systems	MSCS2.5	<p>CO1:To introduce the Building Blocks of Embedded System</p> <p>CO2:To Educate in Various Embedded Development Strategies</p> <p>CO3: To Introduce Bus Communication in processors, Input/output interfacing.</p> <p>CO4:To impart knowledge in various processor scheduling algorithms.</p> <p>CO5: To introduce Basics of Real time operating system and example tutorials to discuss on one real time operating system tool</p>
14	DataWarehouse & Data Mining Lab with R/ Python	MSCS2.6	<p>CO1:Ability to add mining algorithms as a component to the existing tools</p> <p>CO2:Demonstrate the classification, clustering and etc. in large data sets.</p> <p>CO3:Ability to apply mining techniques for realistic data.</p>

15	Data communication and computer networks lab	MSCS2.7	<p>CO1: Understand fundamental underlying principles of computer networking</p> <p>CO2: Understand details and functionality of layered network architecture.</p> <p>CO3: Apply mathematical foundations to solve computational problems in computer networking</p> <p>CO4: Analyze performance of various communication protocols.</p> <p>CO5: Compare routing algorithms</p> <p>CO6: Practice packet /file transmission between nodes</p>
16	Object Oriented Software Engineering	MSCS3.1	<p>CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modeling Language (UML) basics, in the development of software solutions.</p> <p>CO2: Analyze and specify software requirements, develop use cases and scenarios, apply objectoriented analysis and design (OOAD) principles</p> <p>CO3: Familiar with the concept of test-driven development (TDD) and its practical implementation</p> <p>CO4: Analyze and Evaluate Software Maintenance and Evolution Strategies</p> <p>CO5: Apply Advanced Object-Oriented Software Engineering Concepts</p>
17	Cryptography & Network Security	MSCS3.2	<p><b>CO1:</b> Analyze and design classical encryption techniques and block ciphers.</p> <p>CO2: Understand and analyze data encryption standard.</p> <p>CO3: Understand and analyze public-key cryptography, RSA and other public-key cryptosystems</p> <p>CO4: such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc.</p> <p>CO5: Understand key management and distribution schemes and design User Authentication</p> <p>CO6: Analyze and design hash and MAC algorithms, and digital signatures.</p> <p>CO7: Design network application security schemes, such as PGP, S/ MIME, IPsec, SSL, TLS,</p> <p>CO8: Know about Intruders and Intruder Detection mechanisms, Types of Malicious software,</p>
18	Elective – II web technologies	MSCS3.3	<p>CO1. Design and develop web applications.</p> <p>CO2. Explain client and server-side scripting and their applicability.</p> <p>CO3. Create scripts using JavaScript in a web page.</p> <p>CO4. Integrate JavaScript in a web page</p>

			CO5. Design forms and check for data accuracy
19	Elective III Cloud Computing	MSCS3.4	CO1:Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing. CO2:Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost. CO3:Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing. CO4:Analyze various cloud programming models and apply them to solve problems on the cloud.
20	MOOCS-I	MSCS3.5	CO1:Developing skills, improving employment opportunities, and preparing for further studies. CO2: MOOCs can also help students discover new interests and prepare for college
21	OOSE LAB	MSCS3.6	CO1:Design & implement complex software solutions using state of the art software solutions using state of art software Engineering Techniques. CO2:To provide working knowledge of UML (Unified Modeling Languages) Sources control and project Management. CO3:To provide working knowledge of the technologies essentially for incorporating in the project. CO4:To expertise for testing and document software.
22	Network security LAB	MSCS3.7	CO1:Develop knowledge to implement client server applications. CO2:Develop skills in UNIX socket programming. CO3:Develop skills to use simulation tools. CO4:Analyze the performance of network protocols. CO5:Analyze the network traffic. CO6:Establish a Connection using TCP/IP Protocol

23	Seminar ON Advanced Topics	MSCS3.8	CO1:To study the latest happenings in the field of IT for understanding of a new field, to summaries and review them. CO2:Provide an opportunity to pursue their interest in research, theoretical and experimental approach. CO3:To effectively communicate by making an oral presentation before an evaluation committee
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24	Project/Thesis Work	MSCS4.1	CO1:Learn to apply the knowledge gained through various courses in solving a real life problem. CO2:Practice different phases of software/system development life cycle. CO3:To introduce the student to a professional environment and/or style typical of a global IT industry,
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