Master of Science in Computer Science and Information Technology

Course Outcome (CO) Statements

Batch: 2019 – 20 (Regulation – 2018)

Program Outcomes (POs)

- **PO01:Computational Knowledge**: Apply knowledge of computing in fundamentals, specialization, mathematics, and domain knowledge to solve problems and create computing models that represent an abstraction for certain requirements.
- **PO02:Problem Analysis:** Identify, formulate, design and solve complex computing problems providing concrete conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
- **PO03: Develop Solutions:** Design, develop and evaluate solutions for computing problems with well-defined components, or processes that meet specified needs.
- **PO04: Modern Tool / Techniques usage:** Select, adapt, and apply appropriate tools, techniques, resources to various computing activities, with an understanding of their limitations.
- **PO05: Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
- **PO06**: **Life-long learning:** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.
- **PO07: Communication Efficiency:** Communicate effectively with the computing community, and with society at large, about computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
- **PO08: Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
- **PO09: Individual and Team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
- **PO10: Innovation and Entrepreneurship:** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.
- **PO11: Conduct Investigations of complex computing problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO12:Project management and finance:** Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Program Specific Outcomes (PSOs)

PSO01: To maintain a high quality, comprehensive and coherent IT curriculum informed by research and practice which enhances each participant's career prospects.

PSO02: To obtain the broad education necessary to understand the impact of IT solutions in a global and societal context

PSO03: Design and develop systems in the areas related to algorithms, networking, web design, cloud computing, machine learning and data analytics of varying complexity

PSO04: Develop professionals with a sound understanding of the field under study and a critical awareness of current issues, who are able to adopt appropriate strategies, and are informed of the wider contextual issues.

PSO05: Ability to take responsibility for continuing to advance their knowledge and understanding and to develop new skills to a high level – both generally and specifically as related to the field of Information and Technology.

PSO06: Demonstrate a systematic understanding of knowledge and a critical awareness of current problems in IT and/or new insights on technologies that are at the forefront of the discipline.

Course Outcomes (COs)

2019-20 Batch

Sem	Course Code	Course Name	Course Outcomes (COs)
I	18MSIT1H01	ADVANCED COMPUTER ARCHITECTURE	**CO1**:Interpret the functional architecture of computing systems. **CO2**: Identify, compare and assess issues related to ISA, memory, control and I/O functions. **CO3**:Design and analyze solutions in the area of computer architecture. **CO4**:Apply the alternative techniques in cache design and their impacts on cost/performance. **CO5**:Examine and apply various configurations and features of mobile, laptops and desktops.
	18MSIT1H02	OBJECT ORIENTED PROGRAMMING -C++ & JAVA	**CO1:** Identify classes, objects, members of a class and relationships among them needed for a specific problem using C++ and Java. **CO2:**Demonstrate the concepts of polymorphism, inheritance, interface and package. **CO3:** Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem. **CO4:** Write Java programs to implement error handling techniques using exception handling. **CO5:** Design and develop Software(applications) using C++ and Java.
	18MSIT1H03	INTRODUCTIO N TO DATA CENTER AND CLOUD TECHNOLOGY	**CO1:** Able To Understand The Essential Ideas And Principles In Data Center Design; Management Of Power, Cooling And Cabling Infrastructure Technique. **CO2:** Demonstrate The Need For A Secured Data Center With Common Attacks And Overview Of Security Fundamentals And Framework. **CO3:** Developing The Fundamental Ideas Behind Cloud Computing, The Evolution Of The Paradigm, Its Applicability, As Well As Virtualization, Concise Illustration About Specific Type Of Cloud. **CO4:** Familiarized With The Value Of Cloud Computing For Business Needs With Scalability, Security And Interoperability. **CO5:** Able Understand The Technical Perspectives Of Cloud Computing By Way Of Automation And Self Service With Server Consolidation, Server Sprawling
	18MSIT1H04	LINUX OPERATING SYSTEM	**CO1:**To learn basic Linux commands and their functions **CO2:** To understand Linux installation and group management **CO3:** To obtain knowledge about packages in Linux administration
			CO4: To explore Infrastructure services to manage system **CO5:** To understand Linux Security

Sem	Course Code	Course Name	Course Outcomes (COs)
	18MSIT1H05	ADVANCE COMPUTER NETWORKS	**CO1:**Configure the Switches and Routers using packet tracer cisco tool.. **CO2:**Construct the LAN and configure the Static and Dynamic routing. **CO3:**Construct and trouble shoot the OSPF and EIGRP routing protocols **CO4:**Demonstrate the Virtual LAN concepts **CO5:**Construct the network and demonstrate the DHCP functions
II	18MSIT2H01	INFORMATION SECURITY AND CRYPTOGRAPHY	**CO1:**Analyze the threats and vulnerabilities in information security. **CO2:**Role of governance in information security and its policies and develop risk management program. **CO3:**Make the asset classification and the roles and responsibilities of it. **CO4:**Use of encryption standards and can explain the various algorithms like DES ,Diffiehellman and RSA. **CO5:**Student can understand about Conventional encryption , Key distribution and management..
	18MSIT2H02	SOFTWARE ENGINEERING AND TESTING	**CO1:** Basic knowledge and understanding of the analysis and design of complex systems and ability to apply software engineering principles and techniques. **CO2 :** Work as an individual and as part of a multidisciplinary team to develop and deliver quality software and produce efficient, reliable, robust and cost-effective software solutions. **CO3:** To manage time, processes and resources effectively by prioritizing competing demands to achievepersonal and team goals Identify and analyzes the common threats in each domain. **CO4:** List a range of different software testing techniques and strategies and be able to applyspecific(automated) unit testing method to the projects. **CO5:** Demonstrate the integration testing which aims to uncover interaction and compatibilityproblems as early as possible.
	18MSIT2H03	HUMAN COMPUTER INTERACTION DESIGN	**CO1**: To familiarize the students with the importantance for interaction design. **CO2**: To outline the nature of user frustration and how to reduce it. **CO3**: To explain the main principles of a user-centered approach and ethical issues **CO4**: To acquaint studnets to do usability testing through examples. **CO5**: Apply theories and concepts associated with effective work design to real-world application.

Sem	Course Code	Course Name	Course Outcomes (COs)
	18MSIT2H04	DATABASE MANAGEMENT SYSTEM	**CO1**:Identify the basic concepts and various data model used in database design ER modeling concepts and architecture use and design queries using SQL. **CO2**: Apply relational database theory and be able to describe relational algebra expression, tuple and domain relation expression for queries. **CO3**:Recognize and identify the use of normalization and functional dependency, indexing and hashing technique used in database design and identify the purpose of query processing and optimization and also demonstrate the basic of query evaluation. **CO4**: Apply and relate the concept of transaction, concurrency control and recovery in database. **CO5**: Visualize the features of NoSql and identify the database applications.
	18MSIT2H05	ADVANCE JAVA PROGRAMMING	**CO1:** To learn the Internet Programming, using Java Applets and create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists using Swings **CO2:** To access database through Java programs, using Java Data Base Connectivity (JDBC) **CO3:** To create dynamic web pages, using Servlets and JSP and make a reusable software components using Java Bean. **CO4:** Tounderstand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB). **CO5:** To use Struts frameworks, which gives the opportunity to reuse the codes for quick development and map Java classes and object associations to relational database tables with Hibernate mapping file
III	18MSIT3H01	.Net Programming	**CO1:** List the major elements of the .NET frame work **CO2:** Knowledge on how C# fits into the .NET platform. **CO3:** Analyze the basic structure of .Net application **CO4:** Design and develop Database connectivity applications **CO5:** Develop Web based applications on .NET
	18MSIT3H02	Cyber Security	**CO1**: Interpret the basic concepts of cyber security and their roles. **CO2**: Articulate evidence collection and legal challenges **CO3**: Assess cyber security risk management policies

Sem	Course Code	Course Name	Course Outcomes (COs)
	18MSIT3H03	Web Programming	**CO1**: Develop Web applications using XHTML and JavaScript applying CSS. **CO2**: Build dynamic XHTML documents using Document Object Model (DOM). **CO3**: Design XML document and presentation of XML document using CSS and XSLT. **CO4**: Create Dynamic Web Applications using PHP and MYSQ **CO5**: Create Dynamic Web Applications using PERL and MYSQL
	18MSIT3CE41	Core Elective 1 - Elements of Research	**CO1**: Adopt various principles and concepts of research methodology to their research problems. **CO2**: Apply appropriate method of data collection and analyze using statistical methods. Formulate research methodology for a given engineering and management problem situation. **CO3**: Analyze research outputs in a structured manner and prepare report as per the technical and ethical standards
	18MSIT3CE42	Core Elective 2 - Bio Inspired Computing	**CO1**: Describe the natural phenomena that motivate the discussed algorithms. **CO2**: Understand the strengths, weaknesses and appropriateness of nature- inspired algorithms. **CO3**: Apply nature-inspired algorithms to optimization, design and learning problems **CO4**: Understand fundamental concepts of NP- hardness and computational complexity. **CO5**: Prove algorithm convergence rates using probabilistic arguments.
	18MSIT3CE43	Core Elective 3 - Service Oriented Architecture	**CO1**: Understand the need of service oriented architecture of sustainable dynamic systems. **CO2**: Have a sound knowledge on design principles and to apply for large scale systems. **CO3**: Design architecture for distributed heterogeneous systems. **CO4**: Have good knowledge on service oriented and model driven architectures and the aspect-oriented architecture.
	18MSIT3CE44	Core Elective 4 - Cloud Security	**CO1**: Introduce the broad perceptive of cloud architecture and model **CO2**: Apply different cloud programming model as per need. **CO3**: Explore some important cloud computing driven commercial systems such as, Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications

Sem	Course Code	Course Name	Course Outcomes (COs)
	18MSIT3CE45	Core Elective 5 **-** Internet of Things	**CO1**: Interpret the vision of IoT from a global context. **CO2**: Compare and Contrast the use of Devices, Gateways and Data Management in IoT **CO3**: Implement the state of art architecture in IoT **CO4**: Illustrate the application of IoT in Industrial Automation and identify RealWorld Design Constraints.
IV	18MSIT401	BigData Analytics	**CO1**: Understand how to leverage the insights from big data analytics. **CO2**: Analyze data by utilizing various statistical and data mining approaches. **CO3**: Perform analytics on real –time streaming data.
	18MSIT402	Python programming	**CO1**: Understand principles of Python **CO2**: Understand the pros and cons on scripting languages vs. classical programming languages (at a high level) **CO3**: Understand object oriented programming **CO4**: Understand how Python can be used for application development as well as quick networking, QA and game programming
	18MSIT4CE31	Core Elective 2 - Machine Learning	**CO1**: Differentiate between supervised, unsupervised, semi-supervised machine learning approaches **CO2**: Discuss the decision tree algorithm and identity and overcome the problem of overfitting **CO3**:Discuss and apply the back propagation algorithm and genetic algorithms to various problems **CO4**:Apply the Bayesian concepts to machine learning **CO5**:Analyze and suggest appropriate machine learning approaches for various types of problems
	18MSIT4CE32	Core Elective 2 - Cyber Law	**CO1**: Understand laws governing cyberspace and analyze the role of internet governance in forming policies for internet security. **CO2**:Learn different of cybercrimes and analyze legal frameworks of different countries to deal with these cybercrimes. **CO3**:Learn the importance of jurisdictional boundaries and identify the measures to overcome cross jurisdictional cybercrimes.
	18MSIT4CE33	Core Elective 2 - Advanced Software Engineering	**CO1**: Understand and adhere to professional ethical standards in the system **CO2**: Development and modification process, especially by accepting responsibility for To consequences of design decisions and design implementations. **CO3**: Ability to build and configure major operating system components **CO4**: Ability to analyze and implement solutions to complex problems involving computers and networks **CO5**: Ability to work effectively in teams.

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	18MSIT4CE34	Core Elective 2 - Analysis and Design of Algorithms	**CO1**: Analyze worst-case running times of algorithms using asymptotic analysis. **CO2**: Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms. **CO3**: Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them. **CO4**: Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.
	18MSIT4CE35	Core Elective 2 - Business Intelligence	**CO1**: Identify and describe complex business problems in terms of analytical models. **CO2**: Apply appropriate analytical methods to find solutions to business problems that achieve stated objectives. **CO3**: Translate results of business analytic projects into effective courses of action. **CO4**: Demonstrate ethical decision-making in structured or unstructured and ambiguous situations. **CO5**: Communicate technical information to both technical and non-technical audiences in speech, in writing, and graphically. **CO6**: Exhibit effective collaboration and leadership skills.

Course Outcomes (COs)

2020-21 Batch

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	20MSIT4031	Core Elective 2 - Machine Learning	**CO1**: Differentiate between supervised, unsupervised, semi-supervised machine learning approaches **CO2**: Discuss the decision tree algorithm and identity and overcome the problem of overfitting **CO3**:Discuss and apply the back propagation algorithm and genetic algorithms to various problems **CO4**:Apply the Bayesian concepts to machine learning **CO5**:Analyze and suggest appropriate machine learning approaches for various types of problems
	20MSIT4032	Core Elective 2 - Cyber Law	**CO1**: Understand laws governing cyberspace and analyze the role of internet governance in forming policies for internet security. **CO2**:Learn different of cybercrimes and analyze legal frameworks of different countries to deal with these cybercrimes. **CO3**:Learn the importance of jurisdictional boundaries and identify the measures to overcome cross jurisdictional cybercrimes.
	20MSIT4033	Core Elective 2 - Advanced Software Engineering	**CO1**: Understand and adhere to professional ethical standards in the system **CO2**: Development and modification process, especially by accepting responsibility for To consequences of design decisions and design implementations. **CO3**: Ability to build and configure major operating system components **CO4**: Ability to analyze and implement solutions to complex problems involving computers and networks **CO5**: Ability to work effectively in teams.

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