M.Sc. Information Technology

Program Outcomes

- The Objective of Master's Program in Information Technology is to prepare students for pursue careers as information professionals in a variety of roles and settings.
- Students shall be able to demonstrate knowledge and skills related to:
- Identification of impact of information practices in the rapidly changing technological and global information society.
- Design and implementation of conceptual and technological systems and use knowledge and insights for effective access.
- Develop and implement information systems and services as per user requirements for knowledge creation, retrieval, analysis, interpretation, evaluation and management.
- Use Communication and networking for collaboration, extension growth and change management.
- Undertake research and interdisciplinary activities that contribute to the advancement of the field.
- Abide to legal and ethical responsibilities of the field.

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Program Specific Outcomes

PSO1. Ability to apply the knowledge of Information Technology with recent trends aligned with research and industry.

PSO2. Ability to apply IT in the field of Computational Research, Soft Computing, Big Data Analytics, Data Science, Image Processing, Artificial Intelligence, Networking and Cloud Computing.

PSO3. Ability to provide socially acceptable technical solutions in the domains of Information Security, Machine Learning, Internet of Things and Embedded System, Infrastructure Services as specializations.

PSO4. Ability to apply the knowledge of Intellectual Property Rights, Cyber Laws and Cyber Forensics and various standards in interest of National Security and Integrity along with IT Industry.

PSO5. Ability to write effective project reports, research publications and content development and to work in multidisciplinary environment in the context of changing technologies.

Course Outcomes

M.Sc. Information Technology- Part 1

Subject: Research in Computing

CO1. To be able to conduct business research with an understanding of all the latest theories.

CO2. To develop the ability to explore research techniques used for solving any real world or innovate problem.

Subject: Data Science

CO1. Develop in depth understanding of the key technologies in data science and business analytics: data mining, machine learning, visualization techniques, predictive modeling, and statistics.

CO2. Practice problem analysis and decision-making.

CO3. Gain practical, hands-on experience with statistics programming languages and big data tools through coursework and applied research experiences.

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Subject: Cloud Computing

CO1. To learn how to use Cloud Services.
CO2. To implement Virtualization.
CO3. To implement Task Scheduling algorithms.
CO4. Apply Map-Reduce concept to applications.
CO5. To build Private Cloud.
CO6. Broadly educate to know the impact of engineering on legal and societal issues involved.

Subject: Soft Computing Techniques

CO1. Soft computing concepts like fuzzy logic, neural networks and genetic algorithm, where Artificial Intelligence is mother branch of all.
CO2. All these techniques will be more effective to solve the problem efficiently

Subject: Big Data Analytics

CO1. To provide an overview of an exciting growing field of big data analytics.
CO2. To introduce the tools required to manage and analyze big data like Hadoop, NoSql MapReduce.
CO3. To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.
CO4. To enable students to have skills that will help them to solve complex realworld problems in for decision support

Subject: Modern Networking

CO1. To understand the state-of-the-art in network protocols, architectures and applications.
CO2. Analyze existing network protocols and networks.
CO3. Develop new protocols in networking
CO4. To understand how networking research is done
CO5. To investigate novel ideas in the area of Networking via term-long research projects.

Subject: Microservices Architecture

CO1. Gain a thorough understanding of the philosophy and architecture of Web applications using ASP.NET Core MVC
CO2. Gain a practical understanding of.NET Core
CO3. Acquire a working knowledge of Web application development using ASP.NET Core MVC 6 and Visual Studio Persist data with XML Serialization and ADO.NET with SQL Server Create HTTP services using ASP.NET Core Web API
CO4. Deploy ASP.NET Core MVC applications to the Windows Azure cloud.

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Subject: Image Processing

CO1. Review the fundamental concepts of a digital image processing system.
CO2. Analyze images in the frequency domain using various transforms.
CO3. Evaluate the techniques for image enhancement and image restoration.
CO4. Categorize various compression techniques.
CO5. Interpret Image compression standards.
CO6. Interpret image segmentation and representation techniques.

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M.Sc. Information Technology- Part II

Subject: Technical Writing and Entrepreneurship Development

CO1. This course aims to provide conceptual understanding of developing strong foundation in general writing, including research proposal and reports.

CO2. It covers the technological developing skills for writing Article, Blog, E-Book, Commercial web Page design, Business Listing Press Release, E-Listing and Product Description.

CO3. This course aims to provide conceptual understanding of innovation and entrepreneurship development.

Subject: Applied Artificial Intelligence

CO1. To explore the applied branches of artificial intelligence

CO2. To enable the learner to understand applications of artificial intelligence

CO3. To enable the student to solve the problem aligned with derived branches of artificial intelligence.

Subject: Computer Vision

CO1. To develop the student's understanding of the issues involved in trying to define and simulate perception.

CO2. To familiarize the student with specific, well known computer vision methods, algorithms and results.

CO3. To provide the student additional experience in the analysis and evaluation of complicated systems.

CO4. To provide the student additional software development experience.

CO5. To provide the student with paper and proposal writing experience.

Subject: Cloud Application Development

CO1. To develop and deploy Microservices for cloud

CO2. To understand Kubernetes and deploy applications on Azure Kubernetes Service

CO3. To understand DevOps for Azure

CO4. To follow the DevOps practices for software development

CO5. To build APIs for Azure and AWS

Security Breaches and Countermeasures

CO1. To get the insight of the security loopholes in every aspect of computing.

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CO2. To understand the threats and different types of attacks that can be launched on computing systems.
CO3. To know the countermeasures that can be taken to prevent attacks on computing systems.
CO4. To test the software against the attacks.

Subject: Machine Learning

CO1. Understanding Human learning aspects.
CO2. Understanding primitives in learning process by computer.
CO3. Understanding nature of problems solved with Machine Learning

Subject: BioMedical Image Processing

CO1. To design intelligent systems that can analyze biomedical images.
CO2. To understand different scientific approaches in biomedical image processing.
CO3. To understand the structure of biomedical images and how to correlate it with different biological data.
CO4. To design systems to identify different physical conditions on the basis of biomedical data.

Subject: Cloud Management

CO1. To Understand the Fundamental Ideas Behind Cloud Computing, The Evolution Of The Paradigm, Its Applicability; Benefits, As Well As Current And Future Challenges;
CO2. The Basic ideas And Principles In Data Center Design; Cloud Management Techniques And Cloud Software Deployment Considerations;
CO3. Different CPU, Memory And I/O Virtualization Techniques That Serve In Offering Software, Computation And Storage Services On The Cloud; Software Defined Networks (SDN) And Software Defined Storage (SDS);
CO4. Cloud Storage Technologies And Relevant Distributed File Systems, Nosql Databases And Object Storage;
CO5. The Variety Of Programming Models And Develop Working Experience In Several Of Them.

Subject: Malware Analysis

CO1. Possess the skills necessary to carry out independent analysis of modern malware samples using both static and dynamic analysis techniques.
CO2. Have an intimate understanding of executable formats, Windows internals and API, and analysis techniques.
CO3. Extract investigative leads from host and network-based indicators associated with a malicious program.
CO4. Apply techniques and concepts to unpack, extract, decrypt, or bypass new antianalysis techniques in future malware samples.

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CO5. Achieve proficiency with industry standard tools including IDA Pro, OllyDbg, WinDBG, PE Explorer, ProcMon etc.

Subject: Robotic Process Automation

CO1. To make the students aware about the automation today in the industry.
CO2. To make the students aware about the tools used for automation.
CO3. To help the students automate a complete process

Subject: Virtual Reality and Augmented Reality

CO1. To learn background of VR including a brief history of VR, different forms of VR and related technologies, and broad overview of some of the most important concepts
CO2. To provide background in perception to educate VR creators on concepts and theories of how we perceive and interact with the world around us
CO3. To make learner aware of high-level concepts for designing/building assets and how subtle design choices can influence user behavior
CO4. To learn about art for VR and AR should be optimized for spatial displays with spatially aware input devices to interact with digital objects in true 3D
CO5. Walkthrough of VRTK, an open source project meant to spur on cross-platform development

Subject: Data Centre Technologies

CO1. Identify important requirements to design and support a data center.
CO2. Determine a data center environment's requirement including systems and network architecture as well as services.
CO3. Evaluate options for server farms, network designs, high availability, load balancing, data center services, and trends that might affect data center designs.
CO4. Assess threats, vulnerabilities and common attacks, and network security devices available to protect data centers.
CO5. Design a data center infrastructure integrating features that address security, performance, and availability.
CO6. Measure data center traffic patterns and performance metrics.

Subject: Offensive Security

CO1. Understanding of security requirements within an organization
CO2. How to inspect, protect assets from technical and managerial perspectives
CO3. To Learn various offensive strategies to penetrate the organizations security.
CO4. To learn various tools that aid in offensive security testing.

Subject: Blockchain

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CO1. To provide conceptual understanding of the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.
CO2. To cover the technological underpinnings of blockchain operations as distributed data structures and decision-making systems, their functionality and different architecture types.
CO3. To provide a critical evaluation of existing "smart contract" capabilities and platforms, and examine their future directions, opportunities, risks and challenges.

Subject: Natural Language Processing

CO1. The prime objective of this course is to introduce the students to the field of Language Computing and its applications ranging from classical era to modern context.
CO2. To provide understanding of various NLP tasks and NLP abstractions such as Morphological analysis, POS tagging, concept of syntactic parsing, semantic analysis etc.
CO3. To provide knowledge of different approaches/algorithms for carrying out NLP tasks.
CO4. To highlight the concepts of Language grammar and grammar representation in Computational Linguistics.

Subject: Digital Image Forensics

CO1. To understand describe the origin of computer forensics and the relationship between law enforcement and industry.
CO2. Describe electronic evidence and the computing investigation process.
CO3. Extracting Digital Evidence from Images and establishing them in court of Law.
CO4. Enhancing images for investigation and various techniques to enhance images.
CO5. Interpret and present Evidences in Court of Law.

Subject: Advanced IoT

CO1. To understand the latest developments in IoT
CO2. To build smart IoT applications
CO3. To leverage the applications of IoT in different technologies
CO4. To build own IoT platform

Subject: Cyber Forensics

CO1. Explain laws relevant to computer forensics
CO2. Seize digital evidence from pc systems
CO3. Recover data to be used as evidence
CO4. Analyze data and reconstruct events
CO5. Explain how data may be concealed or hidden

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Subject: Deep Learning

CO1. To present the mathematical, statistical and computational challenges of building neural networks

CO2. To study the concepts of deep learning

CO3. To enable the students to know deep learning techniques to support real-time applications

Subject: Remote Sensing

CO1. Attain a foundational knowledge and comprehension of the physical, computational, and perceptual basis for remote sensing.

CO2. Gain familiarity with a variety of physical, biological, and human geographic applications of remote sensing.

CO3. Gain basic experience in the hands-on application of remote sensing data through visual interpretation and digital image processing exercises.

CO4. Analyze and synthesize understanding by identifying and developing a research and application proposal using remote sensing.

Subject: Server Virtualization on VMWare Platform

CO1. Identify the need for Server Virtualization

CO2. Describe the components and features of vSphere 6.7 and ESXi

CO3. Describe how VMware's products help solve business and technical challenges with regard to Server Virtualization

Subject: Security Operations

CO1. The SOC (Security Operations Centre) allows an organization to enforce and test its security policies, processes, procedures and activities through one central platform that monitors and evaluates the effectiveness of the individual elements and the overall security system of the organization.

CO2. This will also allow the learners to configure various use cases and detect various attacks across the network and report them in real time and also take appropriate actions.

CO3. This course will cover the design, deployment and operation of the SOC.

CO4. Once this course is completed, students will have the skills to perform your SOC responsibilities effectively.

Subject: Human Computer Interaction

CO1. Understand the important aspects of implementation of human-computer interfaces.

CO2. Identify the various tools and techniques for interface analysis, design, and evaluation.

CO3. Identify the impact of usable interfaces in the acceptance and performance utilization of information systems

Subject: Advanced IoT

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CO1. To understand the applications on image processing in different disciplines.
CO2. To apply the concepts to new areas of research in Image processing.

Subject: Storage as a Service

CO1. Understand the need for Storage Area Network and Data protection to satisfy the information explosion requirements.
CO2. Study storage technologies: SAN, NAS, IP storage etc., which will bridge the gap between the emerging trends in industry and academics.
CO3. To get an insight of Storage area network architecture, protocols and its infrastructure.
CO4. To study and discuss the applications of SAN to fulfill the needs of the storage management in the heterogeneous environment.
CO5. Study and understand the management of Storage Networks
CO6. To understand different techniques of managing store.

Subject: Information Security Auditing

CO1. Understand various information security policies in place.
CO2. Assess an organization based on the needs and suggest the requisite information security policies to be deployed.
CO3. Audit the organization across relevant policies and assist the organization in implementing such policies along with suggesting improvements.

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