

SNDT Women's University

P. G. Department of Computer Science

Name of Programme: Master of Computer Application (MCA)

Program Outcomes		
<ol style="list-style-type: none">1. Produce knowledgeable and skilled human resources which are employable in IT sector.2. Impart knowledge required for planning, designing and building complex Application Software Systems as well as provide support to automated systems or application.3. Produce entrepreneurs who can develop customized solutions for small to large Enterprises.4. To develop academically competent and professionally motivated personnel, equipped with objective, critical thinking, right moral and ethical values that compassionately foster the scientific temper with a sense of social responsibility.5. To develop students to become globally competent.6. To inculcate Entrepreneurial skills among students		
Program Specific Outcomes		
<p>The Master of Computer Applications Programme will prepare its graduates to achieve:</p> <ol style="list-style-type: none">1. The understanding to apply knowledge of computing and technological advances appropriate to the programme.2. Skills to analyze a problem, and identify and define the logical modeling of solutions.3. An ability to design implements and evaluate a computer-based system, process, component, or programme to meet stakeholder needs.4. The knack to function effectively in teams to accomplish a common goal.5. A sense of professional, ethical, legal, security and social issues and responsibilities.6. Effectiveness in communicating with a wide range of audiences.7. An ability to analyze the local and global impact of business solutions on individuals, organizations, and society.8. An identification of the need to engage in continuing professional development.		
Course Outcomes		
MCA Semester-I		
Course Code	Course Name	Course Outcomes
1101	Mathematical Foundation of Computer Science	<ol style="list-style-type: none">1. To understand the basic notions of Induction and state machine.2. To understand graphs and its applications in Computer Science.3. To understand the methods of statistical inference and the role of probability in computer science.4. To be able to perform correct and meaningful statistical analysis of simple to moderate complexity.

1102	Research Methodology and IPR	<ol style="list-style-type: none"> 1. Understand research problem formulation. 2. Analyze research related information. 3. Follow research ethics 4. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity. 5. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. 6. Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.
1103	Advanced Data Structure	<ol style="list-style-type: none"> 1. Describe, explain and use abstract data types including stacks, queues and lists. 2. Design and Implement Tree data structures and Sets. 3. Understand and implement nonlinear data structures – graphs 4. Understand various algorithm design and implementation
1104	Advanced Java (Contents: spring, MVC, Net Beans and Hibernate)	<ol style="list-style-type: none"> 1. Understand the advance web concepts associated with JAVA. 2. Familiarize with hibernate. 3. Familiarize with the MVC architecture. 4. Familiarize with the Spring framework.
1105	Computer Network Programming using Linux	<ol style="list-style-type: none"> 1. Understand the working principle of Socket programming. 2. Familiarize with the IPC using Linux.
1201	Advanced Data Structure Lab	<ol style="list-style-type: none"> 1. Choose appropriate data structures, understand the ADT/libraries, and use it to design algorithms for a specific problem. 2. Understand the necessary mathematical abstraction to solve problems. 3. Familiarize with advanced paradigms and data structure used to solve algorithmic problems. 4. Come up with analysis of efficiency and proofs of correctness.
1202	Advanced Java lab	<ol style="list-style-type: none"> 1. Understand the advance web concepts associated with JAVA. 2. Familiarize with hibernate. 3. Familiarize with the MVC architecture. 4. Familiarize with the Spring framework.
1203	Computer Network Programming Lab	<ol style="list-style-type: none"> 1. Understanding of the working principle of Socket programming 2. Familiarize with the IPC using Linux

MCA Semester-II

2101	Managerial Economics	<ol style="list-style-type: none"> 1. Understand the roles of managers in firms. 2. Understand the internal and external decisions to be made by managers. 3. Analyze the demand and supply conditions and assess the position of a company. 4. Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets. 5. Analyze real-world business problems with a systematic theoretical framework. 6. Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.
2102	Software Architecture	<ol style="list-style-type: none"> 1. Students will cite knowledge of various approaches to document a software system (Remembering). 2. Students will be able to describe functional and non-functional requirements (Understanding). 3. Students will be able to use proper architecture for software (Applying). 4. Students will be able to categorize different components used in the software system (Analyzing). 5. Students will be able to choose from different architectural styles (Evaluating). 6. Students will be able to improve quality of software by selecting proper architecture (Creating).
2103	Artificial Intelligence	<ol style="list-style-type: none"> 1. Learn the concepts of biological foundations of artificial neural networks. 2. Learn Feedback networks and radial basis function networks and fuzzy logics. 3. Identify fuzzy and neural network. 4. Acquire the knowledge of GA.
2104	Advanced Databases	<ol style="list-style-type: none"> 1. Understand relational database management systems, normalization to make efficient retrieval from database and query.
2105 A	Elective-I:Image Processing	<ol style="list-style-type: none"> 1. Understand image representation. 2. Enhance image quality using image enhancement techniques. 3. Filter given image using frequency domain filtering technique. 4. Select the right image restoration technique to remove degradation from given image. 5. Represent image using minimum number of bits using image compression. 6. Understand image segmentation technique. 7. Do morphological operations on given image.
2105 B	Elective-I:Ethical Hacking	<ol style="list-style-type: none"> 1. Understand the core concepts related to malware, hardware and software vulnerabilities and their causes. 2. Understand ethics behind hacking and vulnerability disclosure. 3. Appreciate the Cyber Laws and impact of hacking. 4. Exploit the vulnerabilities related to computer system and networks using state of the art tools and technologies.
2105 C	Elective-I:IOT	<ol style="list-style-type: none"> 1. Explain what is internet of things. 2. Explain architecture and design of IoT. 3. Describe the objects connected in IoT. 4. Understand the underlying Technologies. 5. Understand the platforms in IoT. 6. Understand cloud interface to IoT.
2105 D	Elective-I:GAME DEVELOPME	Be a better C++ programmer than they were when they entered the class.

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2105 E	Elective-I:Block Chain	<ol style="list-style-type: none"> 1. Understand how blockchain systems (mainly Bitcoin and Ethereum) work and to securely interact with them. 2. Design, build, and deploy smart contracts and distributed applications.
2201	Web Engineering Lab(Contents: CSS, Angular js, node js, PhP, Mysql,etc)	<ol style="list-style-type: none"> 1. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how. 2. Create web pages using HTML and Cascading Styles sheets. 3. Analyze a web page and identify its elements and attributes. 4. Create dynamic web pages using JavaScript. 5. Build web applications using PHP. 6. Create XML documents and XML Schema. 7. Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHP and protocols in the workings of the web and web applications. 8. Have a Good grounding of Web Application Terminologies like JSON, jQuery, Angular Js, Node.js.
2202	Software Testing and Quality Assurance Lab	<ol style="list-style-type: none"> 1. Select and classify measurement scales and models, software metrics and measures addressing software quality and reliability. 2. Conduct unit and integration tests by determining test design, test automation, test coverage criteria using testing frameworks and test adequacy assessment using control flow, data flow, and program mutations. 3. Apply suitable higher order testing techniques and methods in order to achieve verified and validated software by following testing best practices. 4. Demonstrate the skillset as a tester to neutralize the consequences of wicked problems by narrating effective test cases and test procedures. 5. Adapt to various test processes, types of errors and fault models and methods of test generation from requirements for continuous quality improvement of the software system along with Software Quality best practices usage. 6. Apply software testing cycle in relation to software development and project management focusing incidents and risks management within a project towards efficient delivery of software solutions and implement improvements in the software development processes by making use of standards and baselines.
2203	Mobile Computing lab	<ol style="list-style-type: none"> 1. Design and Implement various mobile applications using emulators. 2. Deploy applications to hand-held devices
2204	Artificial Intelligence Lab	<ol style="list-style-type: none"> 1. Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents, Function networks and fuzzy logics. 2. Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
2205	Advanced Databases Lab	<ol style="list-style-type: none"> 1. Effectively use the various databases. 2. To implement the queries on various databases.
MCA Semester-III		
3101	Cyber Security	<ol style="list-style-type: none"> 1. Understand the concept of cybercrime and its effect on outside world 2. Interpret and apply IT law in various legal issues 3. Distinguish different aspects of cyber law 4. Apply Information Security Standards compliance during software design and development

3102	Data science and Analytics	<ol style="list-style-type: none"> 1. Explain how data is collected, managed and stored for data science 2. Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists 3. Implement data collection and management scripts using MongoDB
3103	Cloud Computing	<ol style="list-style-type: none"> 1. Identify security aspects of each cloud model 2. Develop a risk-management strategy for moving to the Cloud 3. Implement a public cloud instance using a public cloud service provider 4. Apply trust-based security model to different layer
3104	Machine learning	<ol style="list-style-type: none"> 1. Extract features that can be used for a particular machine learning approach in various applications. 2. To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach. 3. To mathematically analyze various machine learning approaches and paradigms.
3105 A	Elective-II:SOFT COMPUTING	<ol style="list-style-type: none"> 1. Identify and describe soft computing techniques and their roles in building intelligent machines. 2. Apply fuzzy logic and reasoning to handle uncertainty and solve various engineering problems. 3. Apply genetic algorithms to combinatorial optimization problems. 4. Evaluate and compare solutions by various soft computing approaches for a given problem.
3105 B	Elective-II:GEOGRAPHICAL INFORMATION SYSTEMS	<ol style="list-style-type: none"> 1. The basic concepts and components of GIS. 2. The techniques used for storage of spatial data and data compression. 3. The practices used for input, management and output of spatial data. 4. Concepts of spatial data quality and data standards.
3105 C	Elective-II:CYBER PHYSICAL SYSTEM	<ol style="list-style-type: none"> 1) Understand the general nature of distributed cyber-physical systems, how they can be modeled and the role of modeling to ensure system quality and timeliness in development processes. 2) Analyze existing cyber-physical systems. Specifying, design and implementation of new cyber-physical systems according to the defined requirements. 3) Understand the application of the principles for software design of distributed cyber-physical systems.
3105 D	Elective-II:Natural Language Processing	<ol style="list-style-type: none"> 1. Understand different building blocks of NLP. 2. Design algorithms for NLP problems. 3. Understand machine translation and its techniques. 4. Learn and use different tools for NLP.
3105 E	Elective-II:BIG DATA ANALYTICS	<ol style="list-style-type: none"> 1. Describe big data and use cases from selected business domains. 2. Explain NoSQL big data management. 3. Install, configure, and run Hadoop and HDFS. 4. Perform map-reduce analytics using Hadoop. 5. Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics.
3201	Data science and Analytics lab (Content:	<ol style="list-style-type: none"> 1. Use Pandas Data Frames, Numpy multi-dimensional arrays, and SciPy libraries to work with a various dataset. 2. To understand pandas, an open-source library, and use it to load, manipulate,

	Implementation using Python)	analyze, and visualize cool datasets.
3202	Cloud computing Lab	<ol style="list-style-type: none"> 1. Configure various virtualization tools such as Virtual Box, VMware workstation. 2. Design and deploy a web application in a PaaS environment. 3. Learn how to simulate a cloud environment to implement new schedulers. 4. Install and use a generic cloud environment that can be used as a private cloud. 5. Manipulate large data sets in a parallel environment.
3203 A	Elective-II Lab:SOFT COMPUTING LAB	<ol style="list-style-type: none"> 1. Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems 2. Apply genetic algorithms to combinatorial optimization problems 3. Apply neural networks to pattern classification and regression problems
3203 B	Elective-II Lab: GEOGRAPHICAL INFORMATION SYSTEMS (LAB)	<ol style="list-style-type: none"> 1. Prepare the different geospatial layers. 2. Compute geometric measurements and perform spatial analysis. 3. Create high-quality maps and associated graphics.
3203 C	Elective-II Lab: CYBER PHYSICAL SYSTEM LAB	1) Analyzing existing cyber-physical systems. Specifying, design and implementation of new cyber-physical systems according to the defined requirements.
3203 D	Elective-II Lab: Natural Language Processing LAB	<ol style="list-style-type: none"> 1. Understand different building blocks of NLP. 2. Design algorithms for NLP problems. 3. Understand machine translation and its techniques. 4. Learn and use different tools for NLP.
3203 E	Elective-II Lab: BIG DATA ANALYTICS LAB	<ol style="list-style-type: none"> 1. Preparing for data summarization, query, and analysis. 2. Applying data modelling techniques to large data sets. 3. Creating applications for Big Data analytics. 4. Building a complete business data analytic solution.
3204	Machine learning lab	<ol style="list-style-type: none"> 1. Effectively use the various machine learning tools. 2. Understand and implement the procedures for machine learning algorithms. 3. Design Python programs for various machine learning algorithms. 4. Apply appropriate datasets to the Machine Learning algorithms. 5. Analyze the graphical outcomes of learning algorithms with specific datasets.
MCA Semester-IV		
4101	Project	<ol style="list-style-type: none"> 1. To give the first-hand experience of analysis, design, implementation and documentation of relevant projects. 2. Analysis of the existing system, Investigating alternatives, Design of a computer-based system Documentation, User training.

4102	Swayam based MOOC	<ol style="list-style-type: none">1. To encourage students to self –learn, a course of interest to the students in Computer Science and Application, that must be completed in form of certification from Swayam.2. The Department will Approve the list of MOOC course at the beginning of the semester IV.3. The students will be required to submit the certificate and give a University External Exam of 100 marks.
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