TECNIA INSTITUTE OF ADVANCED STUDIES
GRADE "A" INSTITUTE
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Department of Information, Communication & Technology

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Programme: Master of Computer Applications

Core Practical Courses

Course Code	Course	Course Objectives	Course Outcomes
MCA-161	Computer Networks Lab	Operating principles of computer networking and acquire practical notions of various communication protocols.	Interpret suitable Network Simulator
		Analysing the network routing algorithms and a practical approach to Ethernet/Internet networking.	Apply network configuration skills to design specific network scenarios.
		Implementing the concept of data transfer between nodes.	Make use of various connecting devices and LAN connectivity to build networks.
		Assembling of networks, and experimenting to understand the layered architecture.	Simulate the working and analyze the performance of various communication protocols.
		Evaluating the challenges in building networks for organizations.	Evaluate routing in the networks and compare different routing algorithms
			Work in teams to design networks for real life scenarios by applying the concepts of all the layered architecture.

MCA-163	Operating System with Linux Lab	Perform Linux Operating System Installation.	Build the Linux operating system and configure it.
		Implement the policies of Process Management, Inter process communication and Memory Management	Discover Linux commands for working with Linux Environment
		Apply the basics of File Management, Device and Disk Storage Management	Appraise the Process algorithms, Process Management system calls, Inter Process Communication and CPU Scheduling algorithms
			Create programs using systems calls for memory management and File Management in C programming, also simulate Deadlock avoidance algorithm using C
MCA-165	Database Management Systems Lab	Working expertise of DDL and DML commands with their application on solving real time problems.	Translate an information model into a relational database schema and to implement the schema using RDBMS
		Ability to apply filters using where clause and nested queries, integrity constraints at table level and column level and to use built-in functions including numeric, character and date functions.	Apply advanced SQL features like views, indexes, synonyms, etc. for database management
		Adequate knowledge to fetch data from multiple tables using different types of JOIN operations.	Analyze PL/SQL structures like functions, procedures, cursors and triggers for database applications.
		Knowledge of the generic structure of PL/SQL programs based on different PL/SQL control structures – Triggers, Cursors, Functions & Procedures and to apply transaction management concepts using Save point, Rollback and Commit statements.	Examine database administration concepts like GRANT, REVOKE etc. through SQL commands.
			Work in teams to design solutions for real world problems/case studies by creating efficient database schema.
MCA-167			Apply Object-Oriented

	Object Oriented Programming and JAVA Lab	Develop working expertise of Object-Oriented concepts in Java.	constructs for creating Java programs.
			Make use of exception handling, multithreading, and collection framework for constructing effective solutions.
		Construct Java based computing solutions on real world case studies implementing concepts studied in theory	Inspect the use of event handling and JFC based toolkit for GUI-based computing solutions.
			Design database applications using JDBC, RMI, I/O operations, network programming and relevant concepts.
			Elaborate the functional programming concepts introduced in Java 8 and beyond.
MCA-169	Minor Project-I	Develop working expertise of solving complex computing problems through project based learning approach using real world case studies by implementing the concepts studied in the theory courses of 1st semester.	Apply acquired knowledge within the chosen technology for solution of specific problem.
			Analyze the technical aspects of the chosen project through a systematic and comprehensive approach.
			Deduct plausible solution for the technical aspects of the project.
			Work as an individual or in teams to develop the technical project.
			Create effective reports and documentation for all project related activities and solutions.
MCA-162	Data and File Structures Lab	Implementing various data structures using a programming language.	Illustrate basic data structures - arrays and linked lists.
			Implementing different operations on data and file structures.
			Build stacks and queues using arrays and linked lists.

			Discover sparse matrix, polynomial arithmetic, searching and sorting techniques and their applications.
		Implementing different operations on data and file structures.	Appraise binary search tree to perform efficient search operations
			Examine and implement graph algorithms.
			Develop an application making extensive use of binary files.
MCA-164	Object Oriented Software Engineering Lab	Implement a real-life project using RUP	Apply object-oriented software engineering concepts to a project.
		Learn new case tools – Rational Rose/ Microsoft Visio/ Star UML.	Build design model diagrams for design phase.
		Develop analysis model, design model and implementation model using the case tool resulting in the completion of project.	Analyze and construct models and diagrams in analysis phase
			Appraise an advanced CASE tool
			Design and deploy a project suitably.
		Ability to deploy the project.	Work in teams to design practical solutions for real life case studies using UML
MCA-166	Python Programming Lab	Basic programming constructs and functions in python.	Demonstrate program creation in Python through usage of appropriate constructs and OOPs concepts.
		Understand the applicability of data structures like lists, tuples, sets and dictionaries in python applications.	Apply the concepts of data structures and string functions in python program.
		Use object-oriented programming features of python to develop applications.	Apply the concepts of file handling and exception handling.
		Learn how to use exception handling in applications for error handling.	Evaluate and visualize the data using appropriate python libraries.

		Design GUI based applications with database connectivity operations.	Develop GUI based applications with database connectivity in Python.
MCA-170	Minor Project-II	Develop working expertise of solving complex computing problems through project based learning approach using real world case studies by implementing the concepts studied in the theory courses of 2nd semester.	Apply acquired knowledge within the chosen technology for solution of specific real world problem.
			Analyze the technical aspects of the chosen project through a Systematic and comprehensive approach.
			Deduct plausible solution for the technical aspects of the project.
			Work as an individual or in teams to develop the technical project.
			Create effective reports and documentation for all project related activities and solutions.
MCA-261	Design and Analysis of Algorithms Lab	Develop working expertise of implementation and expressing the algorithmic solutions using programming languages.	Apply logical thinking to build solutions for given problems.
			Evaluate correctness & efficiency of algorithms using inductive proofs and invariants.
			Design and perform parameter-based analysis of the searching, sorting and tree-based algorithms.
			Create and test optimal solutions for various problems.
MCA-263	Artificial Intelligence and Machine Learning Lab	Design the knowledge base of specific domains.	Apply heuristic search-based algorithms to solve different puzzles.
			Identify reduction techniques on large datasets and reduce their dimensionality.
		Design intelligent systems.	Analyze the datasets for bias and apply appropriate regression techniques.

			Evaluate the learning techniques for classification.
			Implement the knowledge of inferences rules to design the knowledge base.
			Create a domain specific intelligent application.
MCA-269	Minor Project-III	Develop working expertise of solving complex computing problems through project based learning approach using real world case studies by implementing the concepts studied in the theory courses of 3rd semester.	Apply acquired knowledge within the chosen technology for solution of specific problem.
			Analyze the technical aspects of the chosen project through a systematic and comprehensive approach.
			Deduct plausible solution for the technical aspects of the project.
			Work as an individual or in teams to develop the technical project.
			Create effective reports and documentation for all project related activities and solutions.
MCA-202	Dissertation (Major Project)	Develop working expertise of solving complex computing problems through project based learning approach using real world case studies by implementing the concepts studied in all the courses upto 3rd semester.	Apply techniques, skills and modern computing tools necessary for project development.
			Apply team-skills, ethics and professional attitude in professional endeavour.
			Model overall project management through sustainable practices.
			Adapt technological changes and futuristic challenges of the contemporary world.
			Create technical documents and reports.