

Kalinga University

Information Technology

Master Of Computer Applications

PO

S. No.	Program Outcome (PO) Description
1	Computational Knowledge: Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.
2	Problem Analysis: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
3	Design / Development of Solutions: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies
4	Conduct Investigations of Complex Computing Problems: Ability to devise and conduct experiments, interpret data and provide well informed conclusions
5	Modern Tool Usage: Ability to select modern computing tools, skills and techniques necessary for innovative software solutions
6	Professional Ethics: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
7	Life-long Learning: Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.
8	Project Management: Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
9	Communication Efficacy: Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
10	Societal & Environmental Concern: Ability to recognize economic, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

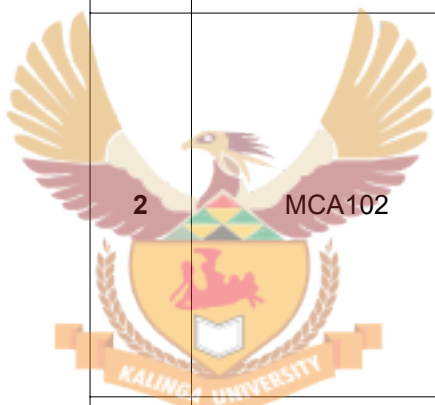
11	Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment.
12	Innovation and Entrepreneurship: Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

PSO

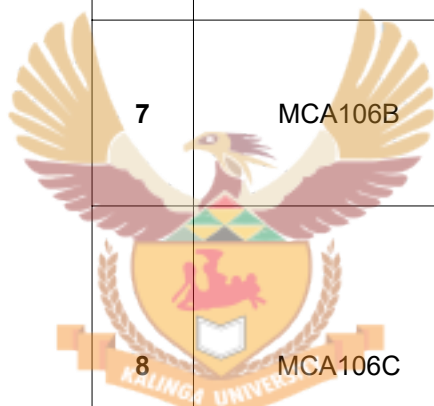
S. No.	Program Specific Outcome (PSO) Description
1	Develop algorithmic solutions advanced computational problems
2	Apply good programming design methods for program development.
3	Read, write, execute advanced computer programs and develop applications
4	Knowledge of various data structures, frameworks, operating systems, technologies for implementing solutions to practical problems
5	Identify the components required to build different types of networks or computer systems

CO

S.No.	Course Code	Course Name	Course Outcome (CO's) - Description
1	MCA101	Fundamental of Computers & Emerging Technologies	CO1: Demonstrate the knowledge of the basic structure, components, generations of computers. features and
			CO2: Describe the concept of computer languages, language translators and construct algorithms to solve problems using programming concepts.
			CO3: Compare and contrast features, functioning & types of operating system and computer networks.
			CO4: Demonstrate architecture, functioning & services of the Internet and basics of multimedia.
			CO5: Illustrate the emerging trends and technologies in the field of Information Technology.
2	MCA102	PROBLEM SOLVING USING C	CO1: Describe the functional components and fundamental concepts of a digital computer system including number systems.
			CO2: Construct flowchart and write algorithms for solving basic problems.
			CO3: Write 'C' programs that incorporate use of variables, operators and expressions along with data types.
			CO4: Write simple programs using the basic elements like control statements, functions, arrays and strings.
			CO5: Write advanced programs using the concepts of pointers, structures, unions and enumerated data types.
3	MCA103	Principles and Practices of Management	CO1: Describe primary features, processes and principles of management.
			CO2: Explain functions of management in terms of planning, decision making and organizing.
			CO3: Illustrate key factors of leadership skill in directing and controlling business resources and processes.
4	MCA104	Discrete Mathematics	CO1: Use mathematical and logical notation to define and formally reason about basic discrete structures such as Sets, Relations and Functions
			CO2: Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument through truth tables and propositional and predicate logic
			CO3: Identify and prove properties of Algebraic Structures like Groups, Rings and Fields
			CO4: Formulate and solve recurrences and recursive functions
			CO5: Apply the concept of combinatorics to solve basic problems in discrete mathematics
			CO1: Describe functional units of digital system and explain how arithmetic and operations are performed by computers

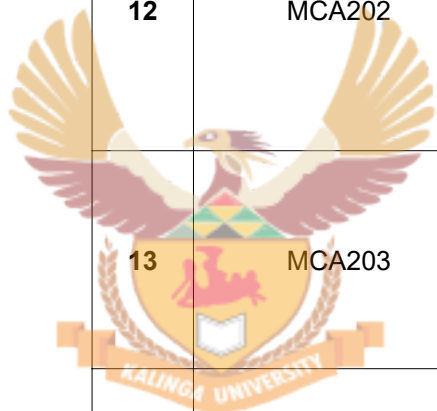


5	MCA105	COMPUTER ORGANIZATION & ARCHITECTURE	CO2: Describe the operations of control unit and write sequence of instructions for carrying out simple operation using various addressing modes.
			CO3: Design various types of memory and its organization.
			CO4: Describe the various modes in which IO devices communicate with CPU and memory.
			CO5: List the criteria for classification of parallel computer and describe various architectural schemes.
6	MCA106A	Cryptography and Network Security	CO1: The students will be able to understand cyber security fundamentals.
			CO2: The students will have basic understanding of cryptography techniques and function.
			CO3: The students will have in depth understanding of network security algorithms including Firewall.
			CO4: The students will be able to know various advanced attacking techniques.
			CO5: The students will be able to know various cyber security policies.
7	MCA106B	Data Warehousing & Data Mining	CO1: Upon completion of the course, the students should be able to:
			CO2: Design a Data warehouse system and perform business analysis with OLAP tools.
			CO3: Apply suitable pre-processing and visualization techniques for data analysis
			CO4: Apply frequent pattern and association rule mining techniques for data analysis
			CO5: Apply appropriate classification and clustering techniques for data analysis
8	MCA106C	Software Project Management	CO1: Define the key concepts of Software Project Management.
			CO2: Demonstrate understanding of the requirements Analysis and Application of UML Models.
			CO3: Make use of estimation logic for estimation of software size as well as cost of software.
			CO4: Examine the need of change management during software development as well as application of quality tools.
			CO5: Assess various factors influencing project management, quality assurance and risk assessment.
			CO6: Develop process for successful quality project delivery.
9	MCA106D	Cloud Computing	CO1: Develop and deploy cloud application using popular cloud platforms
			CO2: Design and develop highly scalable cloud-based applications by creating and configuring virtual machines on the cloud and building private cloud.
			CO3: Make recommendations on cloud computing solutions for an enterprise.
10	MCA106E	Compiler Design	CO1: Students will have a concrete view on the theoretical and practical aspects of compiler design
			CO2: Students will be able to apply ideas and techniques discussed to various software design
			CO3: Students will be able to understand the complexity of compiler.
			CO4: Students will be able to understand the working of runtime environment.

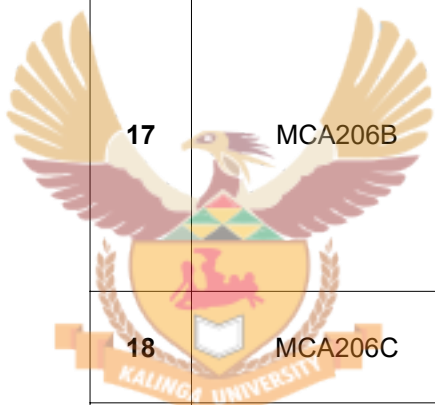


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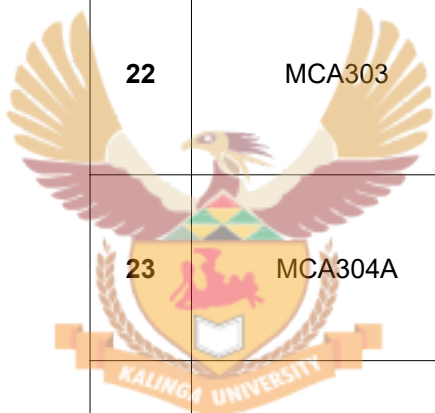
11	MCA201	THEORY OF AUTOMATA & FORMAL LANGUAGES	C01: Define various types of automata for different classes languages and explain their working.
			C02: State and prove key properties of formal languages and automata.
			C03: Construct appropriate formal notations (such as grammars, acceptors, transducers and regular expressions) for given formal languages.
			C04: Convert among equivalent notations for formal languages.
			C05: Explain the significance of the Universal Turing machine, Church- Turing thesis and concept of Undecidability.
12	MCA202	OBJECT ORIENTED PROGRAMMING	C01: List the significance and key features of object oriented programming and modeling using UML
			C02: Construct basic structural, behavioral and architectural models using object oriented software engineering approach.
			C03: Integrate object oriented modeling techniques for analysis and design of a system.
			C04: Use the basic features of data abstraction and encapsulation in C++ programs.
			C05: Use the advanced features such as Inheritance, polymorphism and virtual function in C++ programs.
13	MCA203	OPERATING SYSTEMS	C01: Explain main components, services, types and structure of Operating Systems.
			C02: Apply the various algorithms and techniques to handle the various concurrency control issues.
			C03: Compare and apply various CPU scheduling algorithms for process execution.
			C04: Identify occurrence of deadlock and describe ways to handle it.
			C05: Explain and apply various memory, I/O and disk management techniques
14	MCA204	DATABASE MANAGEMENT SYSTEMS	C01: Describe the features of a database system and its application and compare various types of data models.
			C02: Construct an ER Model for a given problem and transform it into a relation database schema.
			C03: Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.
			C04: Explain the need of normalization and normalize a given relation to the desired normal form.
			C05: Explain different approaches of transaction processing and concurrency control.
			C01: Explain the concept of data structure, abstract data types, algorithms, analysis of algorithms and basic data organization schemes such as arrays and linked lists.
			C02: Describe the applications of stacks and queues and implement various operations on them using arrays and linked lists.



15	MCA205	DATA STRUCTURES & ANALYSIS OF ALGORITHMS	C03: Describe the properties of graphs and trees and implement various operations such as searching and traversal on them. C04: Compare incremental and divide-and-conquer approaches of designing algorithms for problems such as sorting and searching. C05: Apply and analyze various design approaches such as Divide-and-Conquer, greedy and dynamic for problem solving .
16	MCA206A	Web Technology	C01: Build simple websites making use of various Node.js features. C02: Design a dynamic web application enabled with database connectivity C03: Use the fundamentals of Angular.js Filters, Directives and Controllers to build applications C04: Develop Forms and Single page applications (SPA)
17	MCA206B	Big Data Analytics	C01: The students will be able to understand the Big Data Analytics fundamental concepts and visualization techniques. C02: The students will be able to understand various techniques used for mining data stream. C03: The students will be able to understand Hadoop Concepts. C04: The students will be able to Know Hadoop frameworks and big data enabling Technologies. C05: The students will be able to understand about concepts of Open Source database such as NOSQL, HBase etc.
18	MCA206C	Simulation & Modeling	C01: Students completing this course will be able to: C02: Developing simulation system to simulate real life scenarios C03: Exploring scenarios using 3D visualizations
19	MCA206D	Digital Image Processing	C01: Explain the fundamental concepts of a digital image processing System C02: Apply techniques for enhancing digital images C03: Examine the use of Fourier transforms for image processing in the frequency domain C04: Compare various Image compression standards and morphological Operation C05: Identify various Applications of Image Processing
20	MCA301	Computer Network	C01: The students will be able to understand the structure and organization of computer networks; including the division into layers, role of each layer, and relationships between the layers. C02: The students will have basic understanding of Communication techniques and functioning of physical layer. C03: The students will be able to understand the basic concepts of data link layer properties; including the flow control mechanisms.

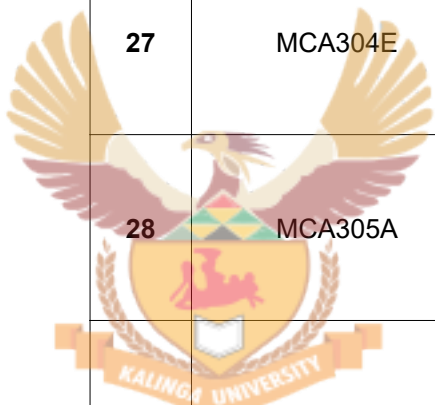


			C04: The students will be able to understand the basic concepts of application layer protocol design i.e. C05: The students will be able to understand the basic concept of network security concepts; including authentication, integrity and system security design challenges.
21	MCA302	Artificial Intelligence	C01: Student will have ability to understand and define different AI problem and apply suitable problem solving technique. C02: Student will have ability to define the heuristics and apply them for solving complex problem with understanding of different heuristic based search techniques. C03: Student will develop an understanding of game playing techniques C04: Student will have understanding of different knowledge structure and inference mechanism with ability to apply them in intelligent solutions of complex problem.
22	MCA303	Software Engineering and Testing	C01: Choose a proper life cycle model for different real-life industrial projects, prepare the SRS document, design the software using function-oriented approach (DFDs) and object-oriented approach (UML diagrams), code it, and test the developed software using different software testing strategies. C02: Understand the concepts of computer aided software engineering (CASE) and use different CASE tools in the development, maintenance and reuse of software systems.
23	MCA304A	Privacy and Security in Online Social Media	C01: Understand working of online social networks C02: Describe privacy policies of online social media C03: Analyse countermeasures to control information sharing in Online social networks. C04: Apply knowledge of identity management in Online social networks C05: Compare various privacy issues associated with popular social media.
24	MCA304B	Soft Computing	C01: Recognize the need of soft computing and study basic concepts and techniques of soft computing. C02: Understand the basic concepts of artificial neural network to analyze widely used neural networks. C03: Apply fuzzy logic to handle uncertainty in various real-world problems. C04: Study various paradigms of evolutionary computing and evaluate genetic algorithm in solving optimization problems. C05: Apply hybrid techniques in applications of soft computing.
25	MCA304C	Pattern Recognition	C01: Study of basics of Pattern recognition. Understand the designing principles and Mathematical foundation used in pattern recognition. C02: Analyse the Statistical Pattern Recognition. C03: Understanding the different Parameter estimation methods.



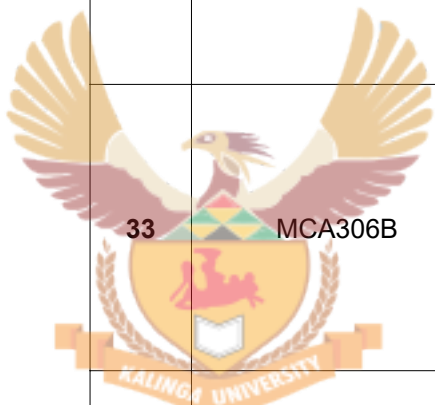
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			C04: Understanding the different Nonparametric Techniques. C05: Understand and Make use of unsupervised learning and Clustering in Pattern recognition.
26	MCA304D	Data Analytics	C01: Describe the life cycle phases of Data Analytics through discovery, planning and building. C02: Understand and apply Data Analysis Techniques. C03: Implement various Data streams. C04: Understand item sets, Clustering, frame works & Visualizations. C05: Apply R tool for developing and evaluating real time applications.
27	MCA304E	Software Quality Engineering	C01: Understand basic concepts of Software Quality along with its documents and process C02: Apply knowledge of Software Quality in various types of software C03: Compare the various reliability models for different scenarios C04: Illustrate the software Quality Planning and Assurance C05: Make use of various testing techniques in software implementation
28	MCA305A	Blockchain Architecture	C01: Study and understand basic concepts of blockchain architecture. C02: Analyze various requirements for consensus protocols. C03: Apply and evaluate the consensus process. C04: Understand the concepts of Hyper ledger fabric. C05: Analyze and evaluate various use cases in financial software and supply chain.
29	MCA305B	Neural Networks	C01: Study of basic concepts of Neuro Computing, Neuroscience and ANN. Understand the different supervised and unsupervised and neural networks performance. C02: Study of basic Models of neural network. Understand the Perception network. and Compare neural networks and their algorithm. C03: Study and Demonstrate different types of neural network. Make use of neural networks for specified problem domain. C04: Understand and Identify basic design requirements of recurrent network and Self-organizing feature map. C05: Able to understand the some special network. Able to understand the concept of Soft computing.
30	MCA305C	Internet of Things	C01: Demonstrate basic concepts, principles and challenges in IoT. C02: Illustrate functioning of hardware devices and sensors used for IoT. C03: Analyze network communication aspects and protocols used in IoT. C04: Apply IoT for developing real life applications using Arduinio programming. C05: To develop IoT infrastructure for popular applications



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31	MCA305D	Distributed Database Systems	C01: Understand theoretical and practical aspects of distributed database systems.
			C02: Study and identify various issues related to the development of distributed database system
			C03: Understand the design aspects of object-oriented database system and related development
			C04: Equip students with principles and knowledge of distributed reliability.
			C05: Equip students with principles and knowledge of parallel and object-oriented databases.
32	MCA306A	Mobile Computing	C01: Study and aware fundamentals of mobile computing.
			C02: Study and analyze wireless networking protocols, applications and environment.
			C03: Understand various data management issues in mobile computing.
			C04: Analyzedifferenttypeofsecurityissuesinmobilecomputing environment.
			C05: Study, analyze, and evaluate various routing protocols used in mobile computing.
33	MCA306B	Computer Graphics and Animation	C01: Understand the graphics hardware used in field of computer graphics.
			C02: Understand the concept of graphics primitives such as lines and circle based on different algorithms.
			C03: Apply the 2D graphics transformations, composite transformation and Clipping concepts.
			C04: Apply the concepts and techniques used in 3D computer graphics, including viewing transformations, projections, curve and hidden surfaces.
			C05: Perform the concept of multimedia and animation in real life.
34	MCA306C	Natural Language Processing	C01: Study and understand basic concepts, background and representations of natural language.
			C02: Analyze various real-world applications of NLP.
			C03: Apply different parsing techniques in NLP.
			C04: Understand grammatical concepts and apply them in NLP.
			C05: Apply various statistical and probabilistic grammar methods to handle and evaluate ambiguity.
35	MCA306D	Machine Learning Techniques	C01: To understand the need for machine learning for various problem solving
			C02: To understand a wide variety of learning algorithms and how to evaluate models generated from data
			C03: To understand the latest trends in machine learning
			C04: To design appropriate machine learning algorithms and apply the algorithms to a real-world problems



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			CO5: To optimize the models learned and report on the expected accuracy that can be achieved by applying the models
36	MCA306E1	Quantum Computing	CO1: Distinguish problems of different computational complexity and explain why certain problems are rendered tractable by quantum computation with reference to the relevant concepts in quantum theory.
			CO2: Demonstrate an understanding of a quantum computing algorithm by simulating it on a classical computer, and state some of the practical challenges in building a quantum computer.
			CO3: Contribute to a medium-scale application program as part of a co-operative team, making use of appropriate collaborative development tools (such as version control systems).
			CO4: Produce code and documentation that is comprehensible to a group of different programmers and present the theoretical background and results of a project in written and verbal form.
			CO5: Apply knowledge, skills, and understanding in executing a defined project of research, development, or investigation and in identifying and implementing relevant outcomes.



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