

Chandigarh Business School of Administration

Master of Computer Applications

Program Outcomes (POs) of MCA

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1	Computational Knowledge	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
2	Problem Analysis	Identify, formulate, research literature, and solve complex computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
3	Design /Development of Solutions	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4	Conduct investigations of complex Computing problems	User search-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	Modern Tool Usage	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
6	Professional Ethics	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
7	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.

8	Communication Efficacy	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
9	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.
10	Individual and Team Work	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
11	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.
12	Life-long Learning	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

MCA Program Educational Objectives (PEOs)

PEO1	To provide opportunities for acquiring in-depth knowledge of fundamental concepts and programming skills for holistic development.
PEO2	To develop the abilities to face the changing industry trends and to apply current tools and technologies to create systems for solving industry oriented problems.
PEO3	To demonstrate the ability to work effectively as a team member and to embed strong human values and professional ethics for becoming social responsibilities.

Course Outcomes of MCA- 1st Semester	
After the Completion of the Course, students will be able to:	
Discrete Structures & Optimization(PGCA1917):C101	
Course Code	Course Outcomes
C101.1	solve problems using the principle of inclusion-exclusion.
C101.2	rules on inference, symbolic logic and Boolean Algebra.
C101.3	apply elementary counting techniques using the product and sum rules.
C101.4	determine the simple or a multigraph, directed or undirected, cyclic or acyclic, and determine the connectivity of a graph.
Programming in Python(PGCA1951): C102	
Course Code	Course Outcomes
C102.1	demonstrate Python environment, data types, operators used in Python.
C102.2	compare and contrast Python with other programming languages.
C102.3	explain the use of control structures and numerous native data types with their methods.
C102.4	design user defined functions, modules, and packages and exception handling methods.
C102.5	construct and handle files in Python and learn Object Oriented Programming Concepts.
Advanced Data Structures (PGCA1952):C103	
Course Code	Course Outcomes
C103.1	choose appropriate data structures and algorithms and design solution for a specific problem.
C103.2	analyze the operations of hashing to retrieve data from data structure.
C103.3	design and analyze programming problem statements.
C103.4	explain with analysis of efficiency and proofs of correctness.
C103.5	select algorithm design approaches in a problem specific manner.
Advanced Database Management System(PGCA1953):C104	
Course Code	Course Outcomes
C104.1	explain the basic concepts of DBMS and RDBMS.
C104.2	apply normalization theory to the normalization of a database.
C104.3	analyze the concept of Transaction Management & Recovery techniques in RDBMS.
C104.4	summarize the concept of Transaction Management & Recovery techniques in RDBMS.
C104.5	develop and implement No SQL databases (Open Source).

Technical Communication(PGCA1905):C105	
Course Code	Course Outcomes
C105.1	demonstrate the Basics of Technical Communication.
C105.2	develop the basic proficiency in reading & listening.
C105.4	select various techniques to enhance verbal communication.
C105.5	make use of various software's for Technical communication.
Data Structures using Python Laboratory (PGCA1954): C103*	
Course Code	Course Outcomes
C103*.1	demonstrate the concept of data structures, python and apply algorithm for solving problems
C103*.2	make use of linear and non-linear data structures for processing of ordered or unordered data..
C103*.3	analyze various algorithms based on their time and space complexity.
C103*.4	construct the trees with linear and non linear
Advanced Database Management System Laboratory (PGCA1955): C104*	
Course Code	Course Outcomes
C104*.1	construct query a database using SQL DML/DDL commands
C104*.2	analyze integrity constraints on a database.
C104*.3	develop PL/SQL programs including stored procedures, stored functions, cursors
C104*.4	design new database and modify existing ones for new applications
C104*.5	inspect various DBA roles/techniques
Technical Communication Laboratory (PGCA1908): C105*	
Course Code	Course Outcomes:
C105*.1	demonstrate the Basics of Technical Communication
C105*.2	develop the basic proficiency in reading & listening, comprehension, writing and speaking skills among students
C105*.3	formulate in order to comprehend spoken and written English language, particularly the language of their chosen technical field
C105*.4	select various techniques to enhance verbal communication
C105*.5	make use of various softwares for Technical communication

Course Outcomes of MCA- 2nd Semester	
After the Completion of the Course, students will be able to:	
Web Technologies(PGCA1909): C201	
Course Code	Course Outcomes
C201.1	Demonstrate the basics of Internet and Web Services.

C201.2	Explain and Distinguish Programming Language and Markup Language.
C201.3	Construct various web pages and web sites together.
C201.4	Show user input from the remote users.
C201.5	Discuss connectivity concepts of Front End and Back End.
Design & Analysis of Algorithms(PGCA1920): C202	
Course Code	Course Outcomes
C202.1	choose problems based on their characteristics and practical importance.
C202.2	develop Algorithms using iterative/recursive approach.
C202.3	design algorithm using an appropriate design paradigm for solving a given problem.
C202.4	classify P, NP or NP Complete problems.
Advanced Java (PGCA1918): C203	
Course Code	Course Outcomes
C203.1	explain the features of advanced Java and write various programs.
C203.2	construct API and implement Serialization concept of Java.
C203.3	analyze Java Generics and develop Projects.
C203.4	develop effective digital and social media strategies.
Linux Administration(PGCA1956): C204	
Course Code	Course Outcomes
C204.1	demonstrate the technical details of Linux operating system.
C204.2	experiment with various Linux command and Implement file hierarchical structuring.
C204.3	create user, manage and configure packages in Linux.
C204.4	classify and configure the various internet services.
Information Security & Cyber Law (PGCA1932): C205	
Course Code	Course Outcomes
C205.1	identify issues involved in the field of information security.
C205.2	explain the key security requirements of Confidentiality, Integrity & Availability.
C205.3	demonstrate the concept of Intrusion Detection & Intrusion Prevention.
C205.4	define the concept of Security policies and Cyber Laws.
Web Technologies Laboratory (PGCA1914): C201*	
Course Code	Course Outcomes
C201*.1	explain Static and Dynamic concepts of web designing.
C201*.2	develop ability to retrieve data from a database and present it online.

C201*.3	construct web pages that apply various dynamic effects on the web site.
C201*.4	clasify complex and large problems using Scripting Language & Markup Language.
Advanced Java Laboratory (PGCA1922): C203*	
Course Code	Course Outcomes
C203*.1	classify problems as P, NP or NP Complete
C203*.2	explain the advanced features of Java and write the programs.
C203*.3	construct API and implement Serialization concept of Java.
C203*.4	analyze Java Generics and develop Projects.
Linux System Administration Laboratory (PGCA1957): C204*	
Course Code	Course Outcomes
C204*.1	make use of digital marketing for developing effective digital and social media strategies
C204*.2	experiment with various commands for performing different operation
C204*.3	apply various Linux administration commands
C204*.4	build and configure various servers in Linux environment

Course Outcomes of MCA- 3rd Semester	
After the Completion of the Course, students will be able to:	
Advanced Computer Networking(PGCA1925):C301	
Course Code	Course Outcomes
C301.1	explain the different Network Models.
C301.2	list different protocols working at Mediam Access Sub Layer.
C301.3	elaborate the concept of network routing through algorithms.
C301.4	explain Internet protocols and network security.
Artificial Intelligence & Soft Computing (PGCA1926): C302	
Course Code	Course Outcomes
C302.1	explain the significance and domains of Artificial Intelligence and knowledge representation.
C302.2	examine the useful search techniques; learn their advantages, disadvantages and comparison.
C302.3	develop the skills to gain a basic Implementing of neural network theory and fuzzy logic theory.
C302.4	apply artificial neural networks and fuzzy logic theory for various problems.

C302.5	determine the use of Genetic algorithm to obtain optimized solutions to problems.
Theory of computation (PGCA1927):C303	
Course Code	Course Outcomes
C303.1	make Use of basic concepts of formal languages for finite automata techniques.
C303.2	design Finite Automata's for different Regular Expressions and Languages.
C303.3	construct context free grammar for various languages.
C303.4	solve various problems of applying normal form techniques, push down automata and Turing Machines.
C303.5	solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation.
E-Commerce and Digital Marketing (PGCA1921):C304	
Course Code	Course Outcomes
C304.1	explain various applications and scope of ecommerce.
C304.2	define various payment modes used in ecommerce today.
C304.3	evaluate a comprehensive digital marketing strategy and plan.
C304.4	develop effective digital and social media strategies.
C304.5	explain the major digital marketing channels - online advertising: Digital display, video, mobile, search engine social media.
Software Project Management (PGCA1930):C306	
Course Code	Course Outcomes
C306.1	explain the process of project management.
C306.2	develop the scope of work, provide accurate cost estimates and to plan the various activities.
C306.3	explain the use risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
C306.4	identify the resources and people required for a project and to produce a work plan and resource schedule.
Advanced Computer Networking Laboratory (PGCA1928):C301*	
Course Code	Course Outcomes
C301*.1	examine the different Network Models
C301*.2	classify working of different devices used to set up LAN.
C301*.3	apply the concept of network routing
C301*.4	Examine and understand Internet protocols and network security.

Artificial Intelligence & Soft Computing Laboratory (PGCA1929):C302*	
Course Code	Course Outcomes
C302*.1	develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.
C302*.2	apply artificial neural networks and fuzzy logic theory for various problems
C302*.3	determine the use of Genetic algorithm to obtain optimized solutions to problems
C302*.4	construct and test auto associative network for input vector
E-Commerce and Digital Marketing Laboratory (PGCA 1974):C307*	
Course Code	Course Outcomes
C307*.1	classify the implementation of ecommerce applications.
C307*.2	develop and implement digital marketing strategy and plan
C307*.3	design and Construce effective digital and social media strategies
C307*.4	build and Make use of working on the social, and security issues concerning the digital marketing and e-commerce.

Course Outcomes of MCA- 4th Semester	
After the Completion of the Course, students will be able to:	
Machine Learning and Data Analytics using Python(PGCA1976):C401	
Course Code	Course Outcomes
C401.1	explain various concepts related to Machine Learning.
C402.2	Compare the features of supervised and unsupervised learning.
C403.3	define clustering and classification algorithms in different various programs.
C404.4	analyze data using Python Numpy and Panda Libraries.
C405.5	summarize data using matplotlib library of Python.
Advanced Web Technologies(PGCA 1958):C402	
Course Code	Course Outcomes
C402.1	explain client-side and server-side programming.
C402.2	how to represent web data and XML document handling.
C402.3	explain AJAX and relevance.
C402.4	develop a dynamic webpage by the use of java PHP and MySQL.
C402.5	apply basic CRUD database operations in a Dynamic website.
C402.6	define web services and their development.

IOT & Blockchain Technology (PGCA1967):C403	
Course Code	Course Outcomes
C403.1	define the various terminologies of IoT and Blockchain.
C403.2	elaborate the steps involved in IoT system design methodology.
C403.3	explain the working of bit coin crypto currency.
C403.4	describe domain specific applications of IoT and Blockchain.
Machine Learning and Data Analytics using Python Laboratory (PGCA1977):C401*	
Course Code	Course Outcomes
C401*.1	develop knowledge of various learning models of data.
C401*.2	test a wide variety of learning algorithms.
C401*.3	classify how to evaluate models generated from data.
C401*.4	apply the algorithms to a real-world problems.
C401*.5	Outline the models learned and report on the expected accuracy that can be achieved by applying the models.
Advanced Web Technologies Laboratory (PGCA 1960):C402*	
Course Code	Course Outcomes
C402*.1	choose the advance concepts of website development.
C402*.2	propose skills to design and develop dynamic web sites.
C402*.3	examine database programming for web applications
C402*.4	classify concepts of jQuery methods, AJAX, Bootstrap and REACT
C402*.5	support Website with an Database Server and perform basic CRUD operations.
C402*.6	develop market ready website, to be used by clients.
IOT & Blockchain Technology Laboratory (PGCA1968):C403*	
Course Code	Course Outcomes
C403.1	make Use of IoT sensors and remotely monitor data and control devices.
C403.2	develop real life IoT based projects.
C403.3	apply blockchain technology and develop blockchain based solutions.
C403.4	build and deploy IoT based blockchain applications for on-premise and cloud based architecture