Program Scheme

Master of Computer Applications Degree Program

Program Code: OMC

Directorate of Distance and Online Education

Batch 2023-2025

University's Vision, Mission, and Core Values

Vision: We visualize Graphic Era (Deemed to be University) as an internationally recognized, equity-driven, ethically engaged, diverse community whose members work collaboratively for positive transformation in the world, through leadership in teaching, research, and social action.

Mission: The mission of the university is to promote learning in true spirit and offer knowledge and skills in order to succeed as professionals. The university aims to distinguish itself as a diverse, socially responsible learning community with high-quality scholarship and academic rigor

Core Values:
- Continuous learning and improvement
- Simplicity
- Integrity and trust
- Ethics

Program Scheme: Master of Computer Applications

1. **Title of the Degree:** Master of Computer Applications (MCA)

2. **Mode of Study:** Fully Online

3. **Program Curriculum will be Effective from:** Academic Year 2023-2024

4. **Rationale for the Program:**

Computers, computer networks, and mobile communication have ushered in the digital revolution in the recent past. The fast-growing information and communication technology (ICT) is critical to strategic planning in most business houses, government organizations, and educational institutes all over the world. Organizations that strive to leverage the latest ICT tools require expert professionals who can apply the principles of computer science and information technology to address the issues effectively. To meet the shortage of qualified professionals in the IT industry, Graphic Era Deemed to be University has designed this Master of Computer Applications (MCA) degree program. The broad objective of this postgraduate program is to prepare graduates for productive careers in the software industry and academia. To accomplish these objectives, the university provides an outstanding environment for teaching and research in the core and emerging areas of this discipline.

The program lays immense emphasis on giving the students a thorough and sound background in theoretical and application-oriented courses relevant to the latest ICT paradigm. The program also focuses on the application of software technology to solve mathematical, computing, communications, networking, and commercial problems.

Professionals with an MCA degree are sought after in numerous corporate sectors, such as IT, Medical Sciences, and Engineering. These sectors need personnel having advanced knowledge of the application of computers to solve real-life problems. Several technology conglomerates in India have job openings for such candidates. With the right amount of experience and skillset, MCA candidates can find several challenging and rewarding career opportunities.

5. Program Educational Objectives (PEOs)

The educational objectives of the MCA program are to:

PEO 1. Empower students with employability towards building successful careers based on a sound understanding of theoretical and applied aspects and methodology to solve multidisciplinary real-life problems.

PEO 2. Develop professional graduates ready to work with a sense of responsibility and ethics.

PEO 3. Instil competency to pursue higher studies and research in areas of computer applications and other professionally related fields.

PEO 4. Inculcate the ability to adapt to changing technology through continuous learning.

6. Programme Outcomes (POs)

Serial Number	Graduate Attribute Theme	The Complete PO Statement
		After the successful completion of the MCA program, the graduates will be able to:
PO-1.	Knowledge Application	Apply the knowledge of mathematics, management, and computer applications to the solution of complex real-world problems.
PO-2.	Problem Analysis	Identify, formulate, review, and analyze complex problems reaching substantiated conclusions using principles of mathematics, management sciences, and computer applications.
PO-3.	Design/Development of Solutions	Design solutions for complex real-world problems and design system components or processes that meet the specified needs with appropriate consideration for health and safety, and cultural, societal, and environmental considerations.
PO-4.	Investigations of Complex Computing Problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO-5.	Modern Tool Usage	Create, select, and apply appropriate techniques, resources, and modern computer software and IT tools including prediction and modeling to complex software engineering activities with an understanding of the limitations.
PO-6.	Environment and Sustainability	Understand the impact of professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO-7.	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the development practice.
PO-8.	Individual and Teamwork	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-9.	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO-10.	Project Management and Finance	Demonstrate knowledge and understanding of the software engineering 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.
PO-11.	Life-Long Learning	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PO-12.	Innovation and Entrepreneurship	Identify a timely opportunity and use innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

7. Programme Specific Outcomes (PSOs)

At the end of the MCA program, the graduate will be able to:

PSO 1. Apply fundamental principles and methods of Computer Science to a wide range of applications.

PSO 2. Design, implement, and document solutions to significant computational problems.

PSO 3. Demonstrate an understanding of the basics of computer applications.

PSO 4. Engage in continued professional development in a career in computer applications.

8. Program Structure:

Semester 1

Sl. No.	Course Type*	Course Code	Course Title	Credits
A	Audit	23OMC100A	Fundamentals of Computers	0
B	Bridge	23OMC100B	Introduction to Operating Systems	0
C	Bridge	23OMC100C	Mathematical Foundation of Computer Science	0
1	DSC	23OMC101	Full Stack Development	3
2	DSC	23OMC102	Computer Networks	3
3	DSC	23OMC103	Programming and Problem-Solving	3
4	DSC	23OMC104	Advanced Operating Systems	3
5	DSE		**Discipline-Specific Elective - 1**	3
		23OMC105A	Advanced Computer Organization	
		23OMC105B	Green Computing	
		23OMC105C	Discrete Structures and Combinatorics	
		23OMC105D	Cloud Computing	
6	SEC	23OMC106	Career Skills	1
7	VAC	23OMC107	General Proficiency/NCC/Seminar/Research/Yoga*	1
8	DSC	23OMC108	Full Stack Development Laboratory	2
9	DSC	23OMC109	Operating Systems and Computer Networks Laboratory	2
10	DSC	23OMC110	Programming and Problem-Solving Laboratory	2
			Total Credits Over the Semester	**23**

*DSC: **D**iscipline-**S**pecific **C**ore **C**ourse	DSE: **D**iscipline-**S**pecific **E**lective Course	GE: **G**eneral **E**lective Course
SEC: **S**kill-**E**nhancement **C**ourse	VAC: **V**alue **A**ddition **C**ourse	

Semester 2

Sl. No.	Course Type*	Course Code	Course Title	Credits
A	Bridge	23OMC200A	Introduction to Database Management Systems	0
B	Bridge	23OMC200B	Introduction to Object-Oriented Programming	0
1	DSC	23OMC201	Advanced Database Management Systems	3
2	DSC	23OMC202	Advanced Java Programming	3
3	DSC	23OMC203	Advanced Data Structures	3
4	**DSE**		**Discipline-Specific Elective - 2**	3
		23OMC204A	Data Mining and Warehousing	
		23OMC204B	Python Programming	
		23OMC204C	Software Project Management	
		23OMC204D	Probability and Statistics	
5	**GE**		**General Elective - 1**	2
		23OMC205A	Research Methodology	
		23OMC205B	Entrepreneurship	
6	SEC	23OMC206	Career Skills	2
7	SEC	23OMC207	Mini Project/Research Publication	1
8	DSC	23OMC208	Advanced Database Management Systems Laboratory	2
9	DSC	23OMC209	Advanced Java Programming Laboratory	2
10	DSC	23OMC210	Advanced Data Structures Laboratory	2
			Total Credits Over the Semester	**23**

Semester 3

Sl. No.	Course Type*	Course Code	Course Title	Credits
A	Audit	23OMC300A	Competitive Programming	0
B	Bridge	23OMC300B	Introduction to Software Engineering	0
1	DSC	23OMC301	Design and Analysis of Algorithms	3
2	DSC	23OMC302	Mobile Application Development	3
3	DSC	23OMC303	Artificial Intelligence and Machine Learning	3
4	DSE	**Discipline-Specific Elective - 3**		3
		23OMC304A	Software Testing and Quality Assurance	
		23OMC304B	Human-Computer Interaction	
		23OMC304C	Theory of Computation and Compiler Construction	
		23OMC304D	Operations Research	
5	SEC	23OMC305	Career Skills	2
6	SEC	23OMC306	Mini Project/Research Seminar	2
7	DSC	23OMC307	Design and Analysis of Algorithms Laboratory	2
8	DSC	23OMC308	Mobile Application Development Laboratory	2
9	DSC	23OMC309	Artificial Intelligence and Machine Learning Laboratory	2
			Total Credits Over the Semester	**22**

Semester 4

Sl. No.	Course Type*	Course Code	Course Title	Credits
1	DSC	23OMC401	Data Science using R	3
2	DSE	**Discipline-Specific Elective - 4**		3
		23OMC402A	Cryptography	
		23OMC402B	Cybersecurity/Information Security	
		23OMC402C	University-Approved MOOC or Certification	
		23OMC402D	Computer-Aided Simulation and Modelling	
3	DSE	**Discipline-Specific Elective - 5**		3
		23OMC403A	C# and .NET	
		23OMC403B	Advanced Graphics and Visual Computing	
		23OMC403C	Soft Computing	
		23OMC403D	Internet of Things	
4	GE	**General Elective - 2**		3
		23OMC404A	Personal Finance	
		23OMC404B	Digital Marketing	
5	SEC	23OMC405	Internship/Dissertation/Capstone Project	8
6	DSC	23OMC406	Data Science Laboratory	2
			Total Credits Over the Semester	**22**
			Total Credits Over the Program	**90**

9. Programme Articulation Matrix (Course-PO-PSO Map)

Sem.	Course Title	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
1	Fundamentals of Computers																
1	Introduction to Operating Systems																
1	Mathematical Foundation of Computer Science																
1	Full Stack Development																
1	Computer Networks																
1	Programming and Problem-Solving																
1	Advanced Operating Systems																
1	Advanced Computer Organization																
1	Green Computing																
1	Discrete Structures and Combinatorics																
1	Cloud Computing																
1	Career Skills																
1	General Proficiency/ NCC/ Seminar/Research/Yoga*																
1	Full Stack Development Laboratory																
1	Operating Systems and Computer Networks Laboratory																
1	Programming and Problem-Solving Laboratory																
2	Introduction to Database Management Systems																
2	Introduction to Object-Oriented Programming																
2	Advanced Database Management Systems																
2	Advanced Java Programming																
2	Advanced Data Structures																
2	Data Mining and Warehousing																
2	Python Programming																
2	Software Project Management																
2	Probability and Statistics																
2	Research Methodology																
2	Entrepreneurship																
2	Career Skills																
2	Mini Project/Research Publication																
2	Advanced Database Management Systems Laboratory																
2	Advanced Java Programming Laboratory																
2	Advanced Data Structures Laboratory																

Sem.	Course Title	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3	PSO-4
3	Competitive Programming																
3	Introduction to Software Engineering																
3	Design and Analysis of Algorithms																
3	Mobile Application Development																
3	Artificial Intelligence and Machine Learning																
3	Software Testing and Quality Assurance																
3	Human-Computer Interaction																
3	Theory of Computation and Compiler Construction																
3	Operations Research																
3	Career Skills																
3	Mini Project/Research Seminar																
3	Design and Analysis of Algorithms Laboratory																
3	Mobile Application Development Laboratory																
3	Artificial Intelligence and Machine Learning Laboratory																
4	Data Science using R																
4	Cryptography																
4	Cybersecurity/Information Security																
4	University-Approved MOOC or Certification*																
4	Computer-Aided Simulation and Modelling																
4	C# and .NET																
4	Advanced Graphics and Visual Computing																
4	Soft Computing																
4	Internet of Things																
4	Personal Finance																
4	Digital Marketing																
4	Internship/Dissertation/ Capstone Project																
4	Data Science Laboratory																

* CO-PO-PSO mapping depends on the course/certification chosen by the student.

10. **Programme Regulations:** The regulations guiding this programme are available in the Program Guide.