Panipat Institute of Engineering & Technology

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Scheme of Studies and Examinations, and the Syllabi

for

Post Graduate Degree Programme

Master of Computer Applications

(in phased manner)

as per NEP-2020 guidelines, and
Curriculum and Credit Framework for Postgraduate Programme

With Multiple Entry-Exit and Internship
w.e.f. Academic Session 2024-25

DEPARTMENT OF COMPUTER APPLICATIONS - PG

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Vision of the Department

To be recognized as a centre of excellence for academic repute to create competent, ethical, and responsible Computer Applications professionals with the abilities to contribute globally to the industry, environment and the society at large.

Mission of the Department

M1: Equip students with knowledge and practical skills in computer applications in line with the needs of the industry.

M2: Foster research and innovation capabilities, imbibe ethics and values, and instill leadership in students to support sustainable development.

M3: To develop students with an analytical mindset and the competence to solve real-life problems.

M4: Facilitate linkages with industry and professional bodies, provide experiential learning opportunities, and develop responsible students with abilities to learn and work independently.

Program Educational Objectives (PEOs)

The Graduate of the program will be able to:

PEO1: Demonstrate analytical abilities, design skills, multidisciplinary competence, critical thinking, and the ability to foster innovations.

PEO2: Demonstrate leadership and supportive roles in the dynamic work environment with ethical behavior and responsibility in their professions.

PEO3: To excel in careers in the diverse domains of computer applications, higher education, and entrepreneurship.

PEO4: Adapt to evolving technologies with the ability to learn independently.

Program Outcomes (POs)

PO1	**Foundation Knowledge**	Apply knowledge of mathematics, programming logic and coding fundamentals for solution architecture and problem solving.
PO2	**Problem Analysis**	Identify, review, formulate and analyse problems for primarily focussing on customer requirements using critical thinking frameworks.
PO3	**Development of Solutions**	Design, develop and investigate problems with as an innovative approach for solutions incorporating ESG/SDG goals.
PO4	**Modern Tool Usage**	Select, adapt and apply modern computational tools such as development of algorithms with an understanding of the limitations including human biases.
PO5	**Individual and Teamwork**	Function and communicate effectively as an individual or a team leader in diverse and multidisciplinary groups. Use methodologies such as agile.
PO6	**Project Management and Finance**	Use the principles of project management such as scheduling, work breakdown structure and be conversant with the principles of Finance for profitable project management.
PO7	**Ethics**	Commit to professional ethics in managing software projects with financial aspects. Learn to use new technologies for cyber security and insulate customers from malware.
PO8	**Life-long learning**	Change management skills and the ability to learn, keep up with contemporary technologies and ways of working.

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)

Master of Computer Applications Semester – I

Course Code	Course Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination	Semester End Examination	Total Marks	Duration of Exam (Hours)
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
MCA-101A	Introduction to Web Technology	3	0	0	3	3	40	60	100	3
MCA-103A	Advanced Data Structures using C++	3	0	0	3	3	40	60	100	3
MCA-105A	Programming with Java	3	0	0	3	3	40	60	100	3
MCA-107A	Operating System and Linux	3	0	0	3	3	40	60	100	3
Practicum Course (PC)										
MCA-171A	Web Technology Lab	0	0	4	4	2	50	50	100	3
MCA-173A	Advanced Data Structures Lab	0	0	4	4	2	50	50	100	3
MCA-175A	Programming with Java Lab	0	0	4	4	2	50	50	100	3
MCA-177A	Operating System and Linux Lab	0	0	4	4	2	50	50	100	3
Skill Enhancement Course (SEC)										
MCA-179A	Seminar	0	0	2	2	1	100		100	
Total		**12**	**0**	**18**	**30**	**21**	**460**	**440**	**900**	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)

Master of Computer Applications Semester – II

Course Code	Curse Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination	Semester End Examination	Total Marks	Duration of Exam (Hours)
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
MCA-102A	Programming with Python	3	0	0	3	3	40	60	100	3
MCA-104A	Computer Networks and Data Communications	3	0	0	3	3	40	60	100	3
MCA-106A	Advanced Data Base Systems	3	0	0	3	3	40	60	100	3
MCA-108A	Software Project Management	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
BT-ME-112A	Design Thinking and Innovation	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
MCA-172A	Programming with Python Lab	0	0	4	4	2	50	50	100	3
MCA-174A	Advanced Data Base Systems Lab	0	0	4	4	2	50	50	100	3
MCA-176A	Networks and Data Communications Lab	0	0	4	4	2	50	50	100	3
Total		**14**	**0**	**12**	**26**	**20**	**350**	**450**	**800**	
Grand Total (1 year Post Graduate Diploma)		**26**	**0**	**30**	**56**	**45**	**860**	**940**	**1800**	

Note 1: The Industrial Internship shall be of 4 credits duration of 45-60 days after the second semester. If a student takes exit after 2nd semester with **Post Graduate Diploma in Computer Applications**, marks of Industrial Internship shall be counted in 2nd semester itself, however the same shall be counted in 3rd semester.

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)

Master of Computer Applications Semester – III

Course Code	Curse Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination	Semester End Examination	Total Marks	Duration of Exam (Hours)
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
MCA-201A	Data Mining and Integration using R	3	0	0	3	3	40	60	100	3
MCA-203A	AI and Machine Learning	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
ASH-HUM-127A	Human Values and Ethics	2	0	0	2	2	40	60	100	3
Discipline-specific Elective Course (DSE)										
MCA-251A	Elective–I	3	0	0	3	3	40	60	100	3
MCA-253A	Elective–II	3	0	0	3	3	40	60	100	3
Practicum Course (PC)										
MCA-271A	Data Mining and Integration using R Lab	0	0	4	4	2	50	50	100	3
MCA-273A	AI and Machine Learning Lab	0	0	4	4	2	50	50	100	3
MCA-275A	Elective–I Lab	0	0	4	4	2	50	50	100	3
Industrial Internship (INT)										
MCA-277A	Industrial Internship	0	0	0	0	4	50	50	100	3
Total		**14**	**0**	**12**	**26**	**24**	**400**	**500**	**900**	

Scheme of Studies and Examinations (w.e.f. Session 2024 - 2025)

Master of Computer Applications Semester – IV

Course Code	Curse Title	Period(s)			Hours/ Week	Credit (s)	Continuous Internal Examination	Semester End Examination	Total Marks	Duration of Exam (Hours)
							(CIE)	(SEE)	(CIE+SEE)	
		L	T	P			Max	Max	Max	
Core Course (CC)										
MCA-202A	Big Data and Pattern Recognition	3	0	0	3	3	40	60	100	3
MCA-204A	Design and Analysis of Algorithms	3	0	0	3	3	40	60	100	3
Value Added Course (VAC)										
MCA-206A	Intellectual Property Rights	2	0	0	2	2	40	60	100	3
Practicum Course (PC)										
MCA-272A	Big Data and Pattern Recognition Lab	0	0	4	4	2	50	50	100	3
Project (PRJ)										
MCA-274A	Project	0	0	20	20	10	50	50	100	3
Total		**8**	**0**	**24**	**32**	**20**	**220**	**280**	**500**	
Grand Total (2 years Post Graduate Degree)		**48**	**0**	**66**	**114**	**85**	**1430**	**1670**	**3100**	

Note 2: Relative weightage of Continuous Internal Evaluation (CIE) and Semester End Examination (SEE), criteria of passing marks, evaluation procedure, and other guidelines are as per the Ordinance of Master of Computer Applications (MCA) programme.

List of Discipline specific Elective Courses:

Elective–I	
MCA-251A (i)	Full Stack Development (MERN) (**M**ongo DB, **E**xpress JS, **R**eact JS, and **N**ode JS)
MCA-251A (ii)	Data Analysis and Visualization using Python
MCA-251A (iii)	Cyber Security
MCA-251A (iv)	Image Processing and Computer Vision
Elective–II	
MCA-253A (i)	Blockchain Technology
MCA-253A (ii)	Cloud Computing and Internet of Things
MCA-253A (iii)	Compiler Design
MCA-253A (iv)	Massive Open Online Course (MOOC)
MCA-253A (v)	Quantum Computing

Abbreviations Used:

Abbreviation	Full Form	Description
CC	**Core Course**	Compulsory core course for the programme, CC will be a theory course of 4 credits
PC	**Practicum Course**	Compulsory practical course (software lab).
DSE	**Discipline-specific Elective Course**	A student can opt for one course out of the given options for Discipline-specific Elective Courses. MOOC elective course can be selected from NPTEL, SWAYAM. MOOC course must be of compulsory 4 credits and shall be from the computer domain and approved by the department committee.
SEC	**Skill Enhancement Course**	The Seminar is a SEC aiming to impart skills of self-learning, comprehension, communication and presentation. It will be of 2 credits. Guidelines regarding seminar are as per the ordinance of the programme.
VAC	**Value-Added Course**	This course aims to instil in students (i) Design Thinking and Innovation (ii) Human Values and Ethics, (ii) Intellectual Property Rights. It will be of 2 credits.
INT	**Industrial Internship**	• The Industrial Internship of 4 credits shall be of 45-60 days duration after the second semester. • If a student takes exit after 2nd semester with Post Graduate Diploma in Computer Applications, marks of Industrial Internship shall be counted in 2nd semester, and the same shall be counted in 3rd semester otherwise.
PRJ	**Project**	Compulsory Project work based on the skills learned.