

**FACULTY OF COMPUTER APPLICATIONS**

**Programme Project Report**

**Masters of Computer Applications**

**(Online Mode)**



**MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH & STUDIES**

(Deemed to be University under section 3 of the UGC Act 1956)

## **1. Program's mission & objectives**

### ➤ **Mission Statement**

1. To impart theoretical and practical training in advanced areas of computer applications and contribute new knowledge through analytical learning which encourages creativity, insight development and a passion for information technology.
2. To provide conducive teaching and learning ambience to generate innovative and problem solving skills with professionalism.

### ➤ **Program Objectives**

The objective of the programme is to develop students to work in fields of Computer Applications in various sectors together with internet technologies, e-business applications etc. The MCA program is focused on exposing students to business application areas. The program provides a strong foundation with an integrated understanding of Information Technology based applications. The program is designed to impart the concepts, values, challenges, opportunities and latest trends in the field of Computer Science to develop a broad practical understanding of its context, purpose, and underlying functional areas. The MCA programme tends more towards software application development and exposure to the latest software tools and techniques to develop the applications.

## **2. Relevance of the program with HEI's Mission and Goals:**

### ➤ **Institutional Mission**

1. To provide an environment in which teachers love to facilitate and students love to learn, consisting of infrastructure facilities at par with the best institutions in India and abroad.
2. To inculcate skills and impart knowledge to the ignited minds in the fields of science & technology and soft skills including leadership, team-building and communication.
3. To create human beings with golden heart, who work and dedicate themselves for the advancement of humanity.
4. To undertake research and development activities in collaboration with the world of work leading to creation of new knowledge in the fields of science, commerce, humanities, engineering & technology, management, health sciences & therapies, sports, multi-media, applied & performing arts.

### ➤ **Institutional Goals**

MREI is dedicated and committed to train and equip its students with the latest knowledge and skills in the chosen fields in the backdrop of Indian ethos and values to enable them to face any global challenge with a view to transforming them into insightful, honorable and

responsible citizens of this great country; and imbibe a work culture of theoretical and applied research leading to creation and dissemination of knowledge.

MRIIRS strives continuously to improve quality of education to nurture the talent of our students to enable them to embark upon a successful career. Our team endeavors to achieve this objective through a proper blend of high conceptual and practical skills supported by excellent infrastructure, teaching methodology and commitment to Quality Management.

➤ **Linkage with Program Mission**

The postgraduate program in computer application will:

1. Ensure students to acquire the requisite technical, soft and human skills to requisite level in the area of computer applications
2. Allow them to pursue careers in IT industry/ consultancy/ research and development, teaching and allied areas related to computer science.
3. To comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Multimedia, Web Design and Big Data Analytics for efficient design of computer-based systems of varying complexity.

### **3. Nature of prospective target group of learners**

All working professionals, populace from even remotest corner of the country, housewives, under privileged and physically challenged who have successfully completed graduate examination conducted by any UGC recognized University or its equivalent in any stream with Mathematics at 10+2 level or UG level is target group of learners for the program. Apart from this, the present employees can improve their qualification and increase their chances of promotions.

### **4. Appropriateness of program to be conducted in Online Mode to acquire specific skills and competence:**

The MCA program offered at MRIIRS by Department of Computer Applications comprises of theory classes, computer labs, self-learning component, assignments, tutorials, project work (software based) and evaluations.

All the components of the program including theory class, computer lab shall be conducted in online mode. The self-learning component is required to be covered by a student with the help of the provided online material and recommended reference books.

Some of the courses of MCA are already available on various MOOC platforms including SWAYAM. However, the institution will develop its own online learning modules which will include the systematic provisioning of assignment and evaluation under Quality Assurance Cell of the University.

## 5. Instructional Design:

### ➤ Curriculum Design/Study Scheme :

The duration of the MCA program is of two years divided into four semesters for students with BCA/ Bachelor Degree in Computer Science Engg or in B.Sc./ B.Com/ B.A. with Mathematics at 10+2 level or at Graduation level.

### Semester 1

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)
				Synchronous Online counselling / webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)		
1	Linear Algebra & Statistical Techniques	4credits	12weeks	12hours	24hours	20	20	44	120
2	Data Structures	3credits	9weeks	9hours	18hours	15	15	33	90
3	Object oriented Programming in Java	3credits	9weeks	9hours	18hours	15	15	33	90
4	Data Structures Lab	1credit	3weeks	3hours	6hours	5	5	11	30
5	Object oriented Programming in Java Lab	1credit	3weeks	3hours	6hours	5	5	11	30
6	Python Programming Lab	1credit	3weeks	3hours	6hours	5	5	11	30
7	Computer Graphics/ Web Application Development using PHP/ Multimedia and Animation	3credits	9weeks	9hours	18hours	15	15	33	90

8	Computer Graphics Lab/ Web Application Development using PHP Lab / Multimedia and Animation Lab	1credit	3weeks	3hours	6hours	5	5	11	30
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## Semester II

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)
				Synchronous Online counselling / webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)		
1	Data Communications	3credits	9weeks	9hours	18hours	15	15	33	90
2	Analysis and Design of algorithm	3credits	9weeks	9hours	18hours	15	15	33	90
3	Artificial Intelligence	3credits	9weeks	9hours	18hours	15	15	33	90
4	Android Application Development Lab	2credit	6weeks	6hours	12hours	10	10	22	60
5	R Programming Lab	2credit	6weeks	6hours	12hours	10	10	22	60
6	Cyber Security/ Mobile Computing	3credits	9weeks	9hours	18hours	15	15	33	90

### Semester III

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)
				Synchronous Online counselling / webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)		
1	Advance Database Systems	3credits	9weeks	9hours	18hours	15	15	33	90
2	Programming in .NET	3credits	9weeks	9hours	18hours	15	15	33	90
3	Software Engg & Testing	3credits	9weeks	9hours	18hours	15	15	33	90
4	Advance Database Systems Lab	2credit	6weeks	6hours	12hours	10	10	22	60
5	NET Lab	2credit	6weeks	6hours	12hours	10	10	22	60
6	Big Data Analytics/ Cloud Computing	3credits	9weeks	9hours	18hours	15	15	33	90
7	Big Data Analytics Lab/ Cloud Computing Lab	2credit	6weeks	6hours	12hours	10	10	22	60

**Semester IV:**

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)
				Synchronous Online counselling / webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)		
1	Advance Java	3credits	9weeks	9hours	18hours	15	15	33	90
2	Software Project Management	3credits	9weeks	9hours	18hours	15	15	33	90
3	Data Mining & Warehousing	3credits	9weeks	9hours	18hours	15	15	33	90
4	Advance Java Lab	2credits	6weeks	6hours	12hours	10	10	22	60
5	Project	6credits	14weeks	14hours	28hours	30	30	66	180

**For Successful completion of the MCA degree, the Learners need to earn 68 credits of compulsory courses and at least 12 credits of elective courses University Core, University elective, Inter-disciplinary, Generic, on-line Courses (MOOCs etc)**



## University Core Courses

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)	Proposed Faculty Name
				Synchronous Online counselling/ webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)			
1	University Core: Managing people and organization	3credits	9weeks	9hours	18hours	15	15	33	90	To be allocate by the parent department
2	Corporate Governance and Social Technology	3credits	9weeks	9hours	18hours	15	15	33	90	To be allocate by the parent department

**Note: In the University Core Course, the student can select any one course of different discipline.**

## University Elective Courses

S.No	Name of the Course	Credit value of the course	No of weeks	No of Interactive sessions		Hours of Study Material		Self-Study hours including assessment	Total hours of study (based on 30 hours per credit)	Proposed Faculty Name
				Synchronous Online counselling/ webinars/ interactive live lectures (1 hour per week)	Discussion forum/ asynchronous mentoring (2 hours / week)	e-tutorial (in hours)	e-content (in hours)			
1	Emerging areas of Social work Practice (FBSS)	3credits	9weeks	9hours	18hours	15	15	33	90	To be allocate by the parent department
2	Positive Psychology (FBSS)	3credits	9weeks	9hours	18hours	15	15	33	90	
3	Business Strategy and Analytics (FMS)	3credits	9weeks	9hours	18hours	15	15	33	90	
4	Sales and Distribution (FMS)	3credits	9weeks	9hours	18hours	15	15	33	90	

**Note: The student can opt any three courses of different discipline in any of the semester.**

**Total Credits of MCA Program: 68 (Program Core + Program electives) + 12 (University Core + University Elective)=80 Credits**

- For Successful completion of MCA degree, the student shall be required to earn minimum 80 credits in total out of which he/she needs to earn 68 credits of compulsory courses through online classes as tabulated above and at least 12 additional credits through Online (MOOC /Coursera...) platform as approved by the Academic Council of the University.
- A semester typically will have 5-8 lectures (Hrs)/week and 10-16 hrs of interaction/ mentoring session/week. It can be conducted on daily basis five days a week, early morning hours and / or weekend depending on the count of the students and their preferences

- The E-Learning Material shall have the four quadrant approach; as per UGC (Credit Framework for online learning courses through SWAYAM) Regulations, 2016 taking into consideration the following, namely:-
  - Quadrant-I is e-Tutorial; which shall contain: Video and Audio Content in an organized form, Animation, Simulations, Video Demonstrations, Virtual Labs, etc, along with the transcription of the video.
  - Quadrant-II is e-Content; which shall contain; self instructional material, e-Books, illustrations, case studies, presentations etc, and also contain Web Resources such as further references, Related Links, Open source Content on Internet, Video, Case Studies, books including e-books, research papers and journals, Anecdotal information, Historical development of the subject, Articles, etc.
  - Quadrant-III is the Discussion forum for raising of doubts and clarifying them on a near real time basis by the Course Coordinator or his team.
  - Quadrant-IV is Assessment, which shall contain; Problems and Solutions, which could be in the form of Multiple Choice Questions, Fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Assignments and solutions, Discussion forum topics and setting up the FAQs, Clarifications on general misconceptions.
- The students who will participate in at least 75% of the activities (online class + time bound assignments + discussion forms for a subject will be eligible for end semester examination for that course)

➤ **Process of program & Course Approval**

The draft curriculum of the program is prepared keeping in view its relevance to the global, national, regional and local needs by taking the feedbacks from the stakeholders (Parents, Faculty Students, Alumni and Employer) and is then deliberated very meticulously by BOS. It also checks and defines the feasibility, credit hours and scheme of examination. The final recommendations of BOS are further discussed and reviewed in BOF. The recommended program curriculum is then submitted to Academic Council of the University for its Final Approval. On these lines the first year e-contents in the four quadrants will be prepared at least one month before the start of the session. The revision in course contents (addition/deletion), introduction of any new area specific or value-added courses are taken up with the robust mechanism of feedback on curricula prevailing in the university.

➤ **Faculty & Support staff**

The required number of competent and domain specific faculty (Professor, Associate Professor, and Assistant Professor) is already available in the department and shall be allocated as per the requirements stipulated in the UGC Regulations & Guidelines for Online program. Furthermore,

the adequate IT Technical staff are deployed for conduct of Virtual labs and managing the IT infrastructure. Also, administrative staff is available at the department and Institute level for the management of EMS, student records etc.

➤ **Identification of Media**

The required media to be used for the programme for online delivery of its stipulated courses have already been identified with the proportion as stated below:

<b>Media to be used for curriculum</b>	<b>Percentage</b>
Audio/Video material	10%
Work related exercises practical/Quizzes and Assignments	37%
Digital contents	33%
Virtual Labs	20%

➤ **Student Support Services System :**

For the successful implementation and execution of the program, one program coordinator at the level of Professor shall be designated. The designated Program Coordinator at the end of program for a batch of students shall see the overall attainments of expected Program Outcomes to take further necessary corrective measures and actions for its continuous improvement.

In addition to Program Coordinator, for proper planning, execution and regular monitoring of the course content delivery of each course, one Course Coordinator shall be designated, who at the end of completion and examinations of the course, shall see the course attainment level of the students register for that particular course. In addition to the Program and course coordinators, there will be a course mentor (as per UGC guidelines), for providing the academic support to the learners and also for managing the teacher-learner interaction groups. For immediate /addressing to the day to day queries/doubts of the enrolled students, course mentors shall be designated/ appointed for each course.

A transparent and robust feedback mechanism from all stake holders shall be put in place as per the prevalent practice for the normal programmes being offered in the University.

The queries/concerns/issues/grievance shared by the learner/student will have a time bound resolution mechanism. In case the course mentor is not able to handle/resolve the issues, it will be escalated to course coordinator, then to program coordinator and in the last to the Director level. The learner will be informed about the status of his concern through a transparent online Rehressal mechanism.

## 6. Procedure for admissions, curriculum transaction and evaluation

### ➤ **Eligibility Criteria**

50% marks either in BCA/ Bachelor Degree in Computer Science Engg or in B.Sc/ B.Com/ B.A. with Mathematics at 10+2 level or at Graduation level.

### ➤ **Fee Structure**

Rs 1,35,000/- for two years to be paid in two installments.

First year: Rs 80000/-

Second Year: Rs 55000/-

#### ***First Year:***

- First installment of Rs 58000/- at the time of admission and second installment of Rs 22000/- before start of End Semester Examination for 1st Semester

#### ***Subsequent Years:***

- Rs 33000/- one month before start of classes for the academic session 3rd Semester
- Second installment of Rs 22000/- before start of End Semester Examination for 3rd Semester

### ➤ **Scholarship Policy**

#### ***a. On Merit Basis***

- 80 % and above marks/CGPA in Qualifying exam will be awarded 100% tuition fee waiver
- 70% to 79.99% marks/CGPA in qualifying exam will be awarded 50% tuition fee waiver
- 60% to 69.99% marks/CGPA in qualifying exam will be awarded 25% tuition fee waiver

#### ***b. Under Special Category***

<b>Categories</b>	<b>Fee Concession</b>	<b>Documents to be Submitted</b>	<b>Continuation</b>
Empowering Women (For women on Sabbatical)	25% on Tuition Fee	Self Declaration	For all Years
Alumni Special(MREI Alums)	25% on Tuition Fee	Certificate/Degree Having Student enrollment no.	For all Years
Government Special(Working with State Govt. or Central Govt.)	25% on Tuition Fee	ID Proof having Employee no.	For all Years
Sports(State Level & above)	25% on Tuition Fee	State Level or National Level Certificate	For all Years
Divyang	25% on Tuition Fee	Disability Certificate	For all Years

## Conditions for Continuation of Scholarship Policy

Maintain a minimum CGPA of 6.5 Annually (Ist & 2nd Semester). However, if any student considered for fee concession in the first year fails in any of the subject, he/she may be considered for continuation of fee concession provided that he/she shall have to clear the subjects in the subsequent academic year failing which he/she may not be considered for the continuation of Fee Concession.

### ➤ **Web Based Tools to be Adopted**

The online academic delivery will be ensured through Microsoft Teams / Google Meet platforms. All the record keeping will be done by Web based Portal (ICloud EMS) which allows the student to access to the following:

- Admission & Enrolment Details
- Fee Details and Online Fee Payment Gateway
- Prospectus, Regulations & Syllabus
- Notifications (Admissions, fees, examinations etc.)
- Lesson Plan
- Continuous Assessments /Assignments
- Online PCP Classroom Lectures (Recorded or via Virtual Classroom session) as conducted each semester.
- Online Copy of the Grade sheet.
- Recording of the lectures, delivered in online mode.

### ➤ **Activity Planner (for one semester)**

S.No	Name of the Activity	Semester I	
1	Course Registration and start of classes	1 st day of Session	
2	Conduct of the first sessional tests T1(from first half of the syllabus)	49th day	54th day
3	Uploading of the result on the web portal	61th day	
4	Conduct of the second Sessional tests T2 (from second half of the syllabus)	112th Day	117th day
5	Uploading of the result on the web portal	124th day	
6	Conduction of the end semester practical exams	131th day	137th day
7	Conduction of the end semester theory exams	147th day	151th day
8	Upload the complete result on ERP/website	162th day	
9	Next semester academic calendar	166th day	

One application and critical thinking based assignment will be given to the enrolled students after the completion of each unit and the evaluation will be shared with the students within a week's time. The grievances if any should be resolved in max next week. The evaluation of

the assignment should be uploaded on the web portal with in two days of the evaluation of the assignment.

➤ **Examinations**

All the examinations will be conducted with technology enabled online mode with proctored AI and/or the proctored online mode.

The recording of the online proctored examination will be kept/ archived in the records/ for two year, subsequent to the conduct of the examination.

The attendance of examinees shall be authenticated through biometric system as per Aadhaar details or other Government identifiers of Indian learners and Passports for International learners

**Examination Policy:**

The evaluation will include two types of assessments;

(i) Continuous or formative assessments (in the form of end semester examination or term examination. Weightage of assessments are as follows:

For continuous or formative assessment (in semester): Maximum 30 percent. The categorization for the same is:

MCQs	30%
Subjective (Short/Long)	40%
Discussion/Presentation	15%
Projects/Group Activities etc	15%

(ii) For summative assessment (end semester examination or term end examination):

Minimum: 70 percent. Categorization for the same is:

Objective Type Questions:	30%
Short/Long Questions:	70%

**Passing Criteria in Internal Assessment/ Continuous Evaluation and External/ End Semester Evaluation:**

Student will be declared pass in the subject if he/she scores jointly 40% marks in Internal Assessment / Continuous Evaluation and External/ End Semester Evaluation.

Marks or grades obtained in continuous assessment and end semester examinations or term end examinations shall be shown separately in the grade card.

### Grading System:

Grade	Grade Point (GP)	Description of performance	Recommended range of marks in percent	Expected number of students in a Grade
O	10	Outstanding	95 – 100	0
A+	9	Excellent	85 – 94.9	Not > 10%
A	8	Very Good	75 – 84.9	Not > 15%
B+	7	Good	65 – 74.9	Not > 15%
B	6	Above Average	55 - 64.9	Not > 40%
C	5	Average	45 – 54.9	Not > 10%
P	4	Pass	40 - 44.9	Not > 10%
F	0	Fail	0-39.9	Not > 10%
AB	0	Absent		0
AP		Audit Pass		0

Minimum CGPA for award of Degree: 5.0

### 7. Requirement of Library Resources

The library services at Manav Rachna can be accessed using the

link <https://manavrachna.edu.in/international-institute-of-research-and-studies/central-library/>

It offers a range of services for academic and research pursuits:

- Circulation Services
- Reference & Research Services
- Digital Library
- Current Awareness Service
- User Orientation Programs
- Wi-Fi and Internet
- Photocopy, Scanning and Printing Facilities

### 8. Cost estimate of the program and the provisions

Budget for Audio/Video Production, LMS and other requirements:

- Bandwidth- 200Mbps for one year
- 20 users + students unlimited- Rs. 60,000/-
- Cloud Account AWS- Rs. 10,000 – 15,000/- per year
- Virtual Machine- Rs. 1500/- month per virtual machine



## 9. Quality assurance mechanism and expected program outcomes

The IQAC is striving to bring newer initiatives pertaining to research, campus development, ICT adoption in teaching, providing better focus for the research scholars through workshops, coordinating Academic and Administrative Audit of the University, etc. At the end of every academic year, the University conducts assessment of the curriculum/ course/ academic programme by students. The 5 assessment focuses on broad areas like

- 1) Reasons for selecting courses,
- 2) Facilities available in the Departments,
- 3) Quality of the syllabus,
- 4) Internal assessment evaluation,
- 5) Quality of the teacher in terms of regularity to classes, command over language, encouragement of students in the classes, completion of syllabus.

Towards the Quality Assurance Mechanism for online distance Programs, the University shall establish a **Centre for Internal Quality Assurance (CIQA)**. The CIQA will be required to

- Conduct training and capacity building of teaching and administrative staff.
- The University IQAC's cell shall work closely with the CIQA to develop Feedback mechanisms, to allow for Program and Process Review on a regular basis. 360 Degree feedback, from Students, Faculty and Alumni shall be processed, and suggestions and improvements incorporated accordingly.
- The Course shall be benchmarked with the Courses conducted in campus, for online students/learners, in order to ascertain the quality. These indicators shall be used to constantly improve upon the programs, and make them at par industry standards and expectations.
- Coordinate with third party auditing bodies for quality audit of programme(s)
- Prepare and submit an annual report

### Expected Program Outcomes and Program Specific Outcomes

An MCA pass out student is expected to have following attributes which are indicative of the graduates' ability and competence to work as an IT professional upon graduation. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. The department of Computer Applications has following PO's.

- PO-1. **Computational Knowledge:** Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.

- PO-2. **Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
- PO-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
- PO-4. **Conduct Investigations of Complex Computing Problems:** Ability to devise and conduct experiments, interpret data and provide well informed conclusions.
- PO-5. **Modern Tool Usage:** Ability to select modern computing tools, skills and techniques necessary for innovative software solutions
- PO-6. **Professional Ethics:** Ability to apply and commit professional ethics and cyber regulations in a global economic environment.
- PO-7. **Life-long Learning:** Recognize the **need** for and develop the ability to engage in continuous learning as a Computing professional.
- PO-8. **Project Management and Finance:** Ability to understand, management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
- PO-9. **Communication Efficacy:** Communicate effectively **with** the computing community as well as society by being able to comprehend effective documentations and presentations.
- PO-10. **Societal & Environmental Concern:** Ability to recognize **economical**, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice. (How, which course maps to this?)
- PO-11. **Individual & Team Work:** Ability to work as a member or leader in diverse **teams** in multidisciplinary environment. (How team work will be achieved, which course maps to this?)
- PO-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.

### **Program Specific Outcomes**

- PSO 1. Ability to pursue careers in IT industry/ consultancy/ research and development, teaching and allied areas related to computer science.
- PSO 2. Comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Multimedia, Web Design and Big Data Analytics for efficient design of computer-based systems of varying complexity.