Master of Computer Applications (MCA)

SYLLABUS STRUCTURE

FACULTY OF COMPUTER APPLICATIONS
&
INFORMATION TECHNOLOGY

Dr. P. A. Inamdar University, Pune

Two years, Four Semesters, Full time Program
Under Choice Based Credit System (CBCS)
&
Outcome Based Education (OBE) Pattern
as per UGC, AICTE and NEP-2020 Guidelines
Syllabus Effective from 2023

Maharashtra Cosmopolitan Education Society's

Dr. P.A INAMDAR UNIVERSITY, PUNE

Faculty of Computer Application and IT
MCA Programme Curriculum (2023-2025)

Syllabus Effective from 2023 Under Choice Based Credit System (CBCS) and as per UGC, AICTE and NEP-2020 Guidelines

Effective from AY 2023-2024

Preamble:

1.The Name of the program is Master of Computer Application (MCA)

2. The curriculum implements Outcome Based Education along with Choice Based Credit System and Grading System.

3. The main objectives of MCA Programme are to prepare the students industry ready and to take up positions as software developers, programmers, system analysts, system engineers, software engineers, data scientist and versatile IT corporate and academic faculty in the area of computer applications.

4. Accordingly, the MCA program curriculum at DrPAI University is developing IT entrepreneurs and IT professionals.

1.1 Vision, Mission, Quality Policy and Values

Vision
To be one of the most adorable, admired and trustworthy management institutes in India.

Mission
To provide practical and comprehensive management education.
To provide value-based IT education.
To provide development and growth opportunities to faculty and staff.
To create dependable and innovative professionals committed to the nation.
To foster scientific culture at the institute.

Mission of MCA Program

1. To provide applied and value-based IT education.
2. To prepare the students for suitable IT opportunities.
3. To create IT professionals that meet the requirements of changing trends in the IT industry and are committed to the Society and Nation.
4. To Produce professionals who can work through IT problems and provide practical solutions.
5. To develop scientific culture in the faculty and students.
6. To instill values, ethics and professionalism in the students.

Quality Policy

We continuously seek opportunities for improvement, to meet and exceed the needs of our students through a process of self-evaluation and continuous improvement. At AIMS, we are committed to qualitative education to eligible persons, thus creating human assets and enhancing intellectual capital. Our management training provides self-dependability, innovativeness, sociability, sensitivity and adherence to excellence.

Values

Integrity, Passion for truth and innovation, Humanity, Social Equality and Respect.

2 Introduction

The M.C.A. Program is a full-time two-year 112 credits Master's degree in Computer Applications offered by Dr. P. A. INAMDAR University (DrPAI University), Pune and conducted at its Allana Institute of Management Sciences, (MCA) Pune. The institute has excellent faculties, Laboratories, Library, and other facilities to provide a proper learning environment. The expectations and requirements of the software industry, immediately and in the near future, are visualised while designing the MCA programme.

2.1 Key Features:

Two-year Computer Application program with creative and professional Core subjects
Latest Technology of the industry
Professional Ability Enhancement subjects and number of Electives around the core and allied creative or technical fields
Practical Training, Mini Projects and industrial exposure of around six months

2.2 Scope of the Program

The curriculum of an MCA programme includes Machine learning, Artificial Intelligence, Networking, Big Data, Mobile Application, Cloud Computing, business analytics to name a few. There is ample scope in the field of Information Technology with a lot of job opportunities. Candidates having an MCA degree may have great opportunities in top IT companies and top consultancy firms. Some of the top job profiles for MCA graduates are App Developer, Business Analyst, and Database Engineer etc. Pursuing MCA from a recognized university opens various career paths not only within the country but also outside. Innovation is a never-ending journey, and this would require skilled IT professionals all the time, which is one of the biggest advantages of pursuing MCA.

2.3 Program Objectives & Outcomes:

The basic objective of the Master of Computer Application (MCA) is to provide a steady stream of necessary Computer application knowledge, skills and foundation for acquiring a wide range of rewarding careers into rapidly expanding world of Information Technology

2.3.1 Objectives:

1. The main objectives of MCA Programme are to prepare the students industry ready and to take up positions as software developers, programmers, system analysts, system engineers, software engineers, data scientists, database designers and administrator, network engineers, and versatile IT corporate and academic faculty in the area of computer applications.

2. Accordingly the course curriculum aims at developing IT Professionals, IT Entrepreneur and IT experts for solving real world problems.
3. In addition, 'Social Interaction Skills', 'Communication Skills', 'Life Skills', 'Entrepreneurial Skills', and 'Research and analytical skills' which are necessary for career growth and for leading quality life are also imparted.

3.0 Definitions

3.1 Outcome Based Education (OBE) approach

Outcomes are about performance, and this implies:
There must be a performer – the student (learner), not only the teacher
There must be something performable (thus demonstrable or assessable) to perform
The focus is on the performance, not the activity or task to be performed

The curriculum and syllabi for Master of Computer Applications (MCA) program (2023-25) conform to the Outcome Based Education (OBE) approach for a flexible and structured Choice Based Credit System (CBCS).

3.2 Program Educational Objectives (PEOs)

The Program Educational Objectives are statements of objective that describe the expected achievements of graduates in their career, how students are expected to perform and what they are expected to achieve during the first few years after graduation.

3.3 Graduate Attributes (GAs)
The Program Educational Objectives are statements of objective that describe the expected achievements of graduates in their career, how students are expected to perform and what they are expected to achieve during the first few years after graduation.

3.4 Program Outcomes (POs)

Program outcomes are statements of objectives that describe learning and skills achieved at the end of the program.

3.5 Program Specific Outcomes (PSOs)

Programme Outcomes are a set of narrow statements that describes what students (learners) of a particular specialization of the programme are expected to know and be able to perform or attain by the time of graduation. PSOs are also a function of the various course combinations offered by the Institute.

3.6 Learning Outcomes (LOs)

A learning outcome is what a student CAN DO as a result of a learning experience. It describes a specific task that he/she is able to perform at a given level of competence under a certain situation. The three broad types of learning outcomes are: a) Disciplinary knowledge and skills b) Generic skills c) Attitudes and values.

3.7 Course Outcomes (COs)

A set of specific statements that describes the complex performances a student should be capable of as a result of learning experiences within a course.

3.8 Credit
A Credit is measured for a period of one semester (Twelve weeks). It include :

a) Every ONE hour session per week of L amounts to 1 credit per semester
b) Every ONE hour session per week of T amounts to 1 credit per semester,
c) A minimum of TWO hours per week of P amounts to 1 credit per semester,

Each credit is a combination of 3 components viz. Lecture (L) + Tutorials (T) + Practice (Practical / Project Work / Self Study) (P) i.e. LTP Pattern. Indicative LTP, for each course.

3.9 Session

Each teaching-learning, evaluation session shall be of 60 minutes.

4. Admission Details:

4.1 Eligibility for Admission

1. The candidate should be an Indian National
2. The candidate should have passed B.C.A. or B.Sc. (Computer Science) or B.Sc. (IT) or B.E. (CSE) or B. Tech. (CSE) or B.E. (IT) or B.Tech. (IT) or equivalent Degree and obtained at least 50% marks in aggregate (at least 45% in case of candidates of Reserved categories, Economically Weaker Section and Persons with Disability category belonging to Maharashtra State)
3. The candidate should have passed any graduation degree (e.g.: B.E. or B.Tech. or B.Sc or B.Com. or B.A. or B. Voc. etc.,) preferably with Mathematics at 10+2 level or at Graduation level and obtained at least 50% marks in aggregate (at least 45% in case of candidates of Reserved categories, Economically Weaker Section and Persons with Disability category belonging to Maharashtra State)
4. Valid score in any of the following common entrance examinations: MAH-MCA-CET, CMAT & PERA-CET
5. Obtained Score of any other State level Entrance Test of States in India
6. Obtained nonzero positive score in Entrance Exam
7. Should have good communication skills
8. Should be able to converse, read and write in English given that the medium of instruction.
9. The decision of the admissions committee shall be final in deciding the selection of a candidate.

Lateral Entry Eligibility (If Any): NA

4.2 Admission Procedure:

Submit the Application Form either by visiting the campus or online (www.acapp.in)
Review on scores in Common Admission Test and previous academic performance
Admission will be availed for the deserving candidate

4.2.1 Documents Required:

Entrance Exam Score Card.
SSC Marksheet
HSC Marksheet / Diploma Marksheet
Degree Final Year Marksheet
Leaving / Transfer Certificate
Domicile and Nationality Certificate
Migration Certificate
Caste Certificate (if applicable)
3 Colour Photos
2 Photocopies of the Above original Documents

4.3 Documents Required for NRI Admissions:

NRI candidates should produce the Employer Certificate of the sponsor – either Father or Mother.
Application form with all details furnished Photocopies of the following

NRI bank account passbook (front page photocopy)
Passport copy of the parent having NRI status.
Passport copy of student (except for NRI-S candidates)

Equivalence Certificate issued by the Association of Indian Universities (AIU)
NRI Status Certificate in respect of father/mother.
Certificates of Educational Qualifications 10th Std/12th Std/Degree/Transfer Certificate / Migration Certificate (as applicable to specific program)
Medical Fitness Certificate
Undertaking Duly Countersigned by Parent/Guardian.

4.4 Documents Required for International Admissions:

VISA

All International students will require a student visa endorsed by this Institution for joining full-time courses. No other endorsement is acceptable. The visa should be valid for the prescribed duration of the course.
A visa is required for international students. Persons of Indian Origin (PIO), and Overseas Citizens of India (OCI) who possess either OCI (Overseas Indian Citizenship) or PIO cards do not require Indian Visa. OCI and PIO card gives them the freedom to visit India without a visa. OCI and PIO cards are multi-purpose lifelong visas for visiting India. However, those PIOs who do not have PIO or OCI cards have to apply for a student visa.

International Candidates should produce the following:
Proof of age
Proof of nationality
10th Grade mark sheet
12th Grade mark sheet
Degree
Photograph
Application form with all details furnished.
Photocopies of the following
International bank account passbook (front page photocopy)
Passport copy of student.
Equivalence Certificate issued by the Association of Indian Universities (AIU)
Certificates of Educational Qualifications 10th Std/12th Std/Degree/Transfer Certificate / Migration Certificate (as applicable to specific program).
Medical Fitness Certificate
Undertaking Duly Countersigned By Parent/Guardian.

4.5 Selection Basic

The selection would be made in accordance with the instructions periodically provided by Dr.PAIU University and eligibility criterias led down by AICTE new delhi time to time

5.0 MCA Program Focus:

5.1 PROGRAM EDUCATIONAL OUTCOMES(PEOs)

Definitions:

At the end of the MCA programme the learner will possess the following abilities as Learning Outcomes:

PO1: Apply IT information for offering value to stakeholders.
PO2: Design and evaluate IT solutions for complex problems, in order to meet specific needs of the corporate and society.
PO3: Application of research methodology in order to create new knowledge in the IT domain.
PO4: Application of modern computing techniques to multifaceted and complicated computing activities.
PO5: Abide by cyber regulations and commit to professional ethics.
PO6: Continuously engage in independent learning and develop as an IT professional.
PO7: Understand and apply computing knowledge to one's own work, and to teamwork in order to successfully handle computer related projects in a variety of fields.
PO8: Establish the right communication skills (read, write and present) in order to Communicate effectively with the corporate and IT community, and with society at large.
PO9: To Innovate and create Innovative IT ideas in order to add value to society at large.
PO10: To Identify the opportunity in order to create value & wealth for the betterment of all stakeholders.

5.2 Programme Outcomes (POs)

Definitions:

In general, TEN OUTCOMES have been identified and the curriculum and syllabi have been chosen in such a way that each of the courses meets one or more of these outcomes.

PO 1: IT Knowledge: Apply knowledge of IT fundamentals, Computer Applications, mathematics, and various domain knowledge appropriate for the IT specialisation to the abstraction and conceptualisation of Information sciences frameworks from defined problems and requirements.

PO 2: Design & Development of IT Solutions: Design and evaluate solutions for real world problems. Design, develop and evaluate IT projects, components, or processes, IT services that meet the specified needs with appropriate consideration for corporate, business world, public health and safety, cultural, societal, and environmental considerations.

PO 3: Conduct investigations of problems: Use research-based knowledge and research methods including design of IT experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 4: Usage of latest Computer Tools: Create, select, adapt, and apply appropriate techniques, resources, and latest computing tools to complex computer applications, with an understanding of the limitations.

PO 5: Professional Ethics: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional IT services.

PO 6: Long-Term Learning: Recognise the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PO 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.

PO 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.

PO 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.

PO 10: Innovation and Entrepreneurship: Use of Innovative Technique to identify timely opportunities for creating value and wealth for the betterment of an individual and the Nation.

5.3 Graduate Attributes (GAs)

At the end of the MCA program the learner shall exhibit:

GA1: Programming Competence
GA2: Information Technology Expertise
GA3: Problem Solving
GA4: Collaboration and Teamwork
GA5: Lifelong Learning Skills
GA6: Cognitive and Practical Skills
GA7: Creative Thinking
GA8: Research Skills
GA9: Effective Communication and Leadership Quality
GA10: Entrepreneurial and Intrapreneurial Qualities
GA11: Professionalism
GA12: Societal Consciousness

5.4 Course Outcomes (COs)

Course Outcomes are narrower statements that describe what students are expected to know and be able to do it at the end of each course. These relate to the skills, knowledge, and behaviours that students acquire as they progress through the program. Further, each course in the program spells out clear instructional objectives which are mapped to the student outcomes.

6. Choice Based Credit System – CBCS

The Choice Based Credit System gives freedom to opt subjects of candidate's choice, it will be helpful for the aspirant to match the subject with their career, ability and opportunity. The Choice Based Credit System enables a candidate to obtain a degree by adding the required number of credits prescribed for that degree. Each course is assigned a fixed number of choice based credits to be learned.

6.1 CBCS Landscape:

The Choice Based Credit System offers variety of advantages as follows

- ✓ Student centric curriculum
- ✓ Interdisciplinary Curriculum
- ✓ Enhanced Employability
- ✓ Active participation

6.2 Credits

Each course is relegated a specific credit, contingent upon the assessed exertion put in by an understudy. When the understudy passes that course, he/she acquires the credits related to that course. In the Credit framework the accentuation is on the hours placed in by the student and not on the responsibility of the instructor. The meaning of 'credits' can be found on different boundaries based on the learning hours put in, learning results and contact hours, and the quantum of content / prospectus recommended for the course.
The credit can be given as a individual and / or combination of three components (L:T:P) - Lecture (L), Tutorials (T), Practice (Practical / Project Work) (P)

Lecture-Practical / Project-Tutorial (L-P-T)

A course shall have either or all the three components, i.e. a course may have only lecture component, or only practical/project component or a combination of any two/three components

6.2.1 Lecture(L): Classroom sessions delivered by faculty in an interactive mode. It should be conducted as per the scheme of lectures indicated in the respective course.

6.2.2 Practical/Project(P): Practical / Project Work consisting of Hands-on experience /Field Studies / Case studies that equip students to acquire the much-required skill component. Besides separate Practical/Project course, three courses in each semester include few practical assignments and it will be evaluated under internal evaluation

6.2.3 Tutorial (T): Session consisting of participatory discussion/ self-study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture sessions

6.2.4 A Mini project is an assignment that the student needs to complete at the end of every semester in order to strengthen the understanding of fundamentals through effective application of the courses learnt. The detailed guidelines have been given in the course structure.

6.2.5 The Project Work to be conducted in the FINAL Semester and evaluated at the end of the semester. The detailed guidelines have been in the respective course structure.

6.2.6 The teaching / learning as well as evaluation are to be interpreted in a broader perspective as follows:

i) Teaching – Learning Processes: Classroom sessions, Group Exercises, Seminars, Small Group Projects, Self-study, etc.
ii) Evaluation: Tutorials, Class Tests, Presentations, Field work, Assignments, competency based Activity, Research papers, Term papers, etc.

The MCA programme is a combination of:

a. Four-Credit Courses (100 Marks each): 4 Credits each
b. Three-Credit Courses (75 Marks each): 3 Credits each
c. Two-Credit Courses (50 Marks each): 2 Credits each
d. One-Credit Courses (25 Marks each): 1 Credits each

Following are the session details per credit for each of L-P-T model

1) Every ONE-hour session per week of Lecture (L) amounts to 1 credit per semester,
2) Minimum of TWO hours per week of Practical (P) amounts to 1 credit per semester,
3) Minimum of ONE hours per week of Tutorial (T) amounts to 1 credit per semester

6.3 Session Duration
The duration of one teaching session shall be of 1 hr (60 minutes). The institute can extend the session duration in multiple of 1 hr, for example a session can be extended for 2 hours then it will be considered 2 sessions.

6.4 Course Offered / Open Courses (OC)
The objective behind keeping an OS (open subject) is to make students aware of current trends in IT. To offer an open subject institute will discuss with the students and ask their choice. Institute will list down the subjects (max 5 subjects) and call students to attend an introductory session for each open subject and then decide to opt for the open subject. In each semester total 2 open subjects of 2 credits (2x2=4 credits) should be offered.

6.5 Registration Open Courses (OC)
Once the introductory session on each listed subject is given, students should fill their choice. If, in an open subject there are at least 15 candidates then an internal or external faculty is assigned and if there are less than 15 students then the institute will assign a faculty mentor or offer self-study.

7. Extra Reading and Certification

Each chapter in the course includes an additional reading assignment that provides further guidance for acquiring in-depth knowledge in addition to the basic knowledge covered by the syllabus. This additional reading exercise should be made available to learners on a regular basis. Moreover, every course (Where whenever appropriate) provides recommended certification that aids students in enriching themselves in accordance with market expectations and specification

8. Evaluation and Assessment

In total 112 credits represent the workload of a year for the MCA program.

Semester I	Credit	Internal Assessment (IA)	University Examination (UE)
Semester I	28	350	350
Semester II	28	350	350
Semester III	28	350	350
Semester IV	28	350	350
Total	112	1400	1400

The final total assessment of the candidate is made in terms of an internal (concurrent) assessment and an End Term (University) examination for each course. In total the internal (concurrent) to external(university) marks ratio is maintained 50:50.

In general

1) For each course, Total 50 marks will be based on Internal Assessment by Concurrent Evaluation for two times each carrying 25 marks and 50 marks for semester End Examination conducted by University.

2) The internal evaluation of Two times each for 25 marks further divided into Written Examination (Assignments/Unit test/written examination etc.), Practical and Tutorials. The details have been specified in each course.

3) There will be one Practical course and one Mini Project course in each semester with 50 marks allotted for internal evaluation and 50 marks allotted for University examination. External assessment will be done by a university appointed examiner. During external examination, the examiner should ask the programs/practical ONLY from the workbook of the students.

4) The internal marks will be communicated to the University at the end of each semester, but before the semester-end examinations. These marks will be considered for the declaration of the results.

9.1 Guidelines to conduct Mini-Project evaluation for Semester I, Semester II and Semester III of MCA

9.1.1 For Internal Evaluation

1. Internal evaluation will be of 50 Marks. It will be distributed as follows

Description	Marks
Project Report	20
Working Demo	30
Total	50

2. Project Report (including Project Diary) should be evaluated only during INTERNAL evaluation. Textual chapters should be given 10 marks while diagrams, test cases/validations, screen designs should be evaluated for 5 marks and 5 Marks should be given for Project Diary. Thus, totalling up to 20 marks.

9.1.2 External Evaluation

1. Evaluation will be conducted by one Internal (Appointed by Institute) and one External examiner (Appointed by university).

External evaluation will be of 50 Marks. It will be distributed as follows

Description	Marks
Viva	15
Working Demo	35
Total	50

For Internal Evaluation and External Evaluation

1. VIVA should be conducted based on the project domain and technologies used for developing the project. Every team member's individual contribution to the project may vary. Hence VIVA should be based on individual contribution pertaining to the project.

2. Working Demo is given maximum weightage to make sure that each group submits executable versions of their project.

3. Examiners should evaluate the efforts and contribution of every individual in the team (in case of group projects).

4. Examiners may review code of the project while evaluating its working demo and modules.

10.0 MCA Program L-T-P Pattern and Choice based Credit elective Course - Semester I :

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MASTER OF COMPUTER APPLICATION (MCA)

PROPOSED SYLLABUS STRUCTURE

MCA FIRST YEAR

Semester I								
Sr. No	**Subject Name**	**Course Code**	**Credit**	**Teaching Scheme**			**IA**	**UE**
				L	**T**	**P**		
1	Data Structure using C	MCA23101	4	3	1		50	50
2	Operating System	MCA23102	4	3	1		50	50
3	Advance Scripting with HTML & CSS	MCA23103	4	3	1		50	50
4	Computer Networks and Data Communication	MCA23104	4	3	1		50	50
5	Open Elective 1 : <Elective name>	MCA23105	2	1	1		25	25
6	Value Added Course 1 : <Elective name>	MCA23106	2	1	1		25	25
7	Practical - Data Structure & Advance Scripting	MCA23107	4			4	50	50
8	Mini Project	MCA23108	4			4	50	50
TOTAL			**28**				**350**	**350**

***Note : Kindly Refer to Paper Code of** Open Elective 1 (Section 12 **) ,** Value Added Course 1 (Section 13)

* Internal Assessment (IA) conducted by the respective institutes as well as a University Examination (UE)

MCA FIRST YEAR

Semester II								
Sr. No	**Subject Name**	**Course Code**	**Credit**	**Teaching Scheme**			**IA**	**UE**
				L	**T**	**P**		
1	Java Programming	MCA23201	4	3	1		50	50
2	Object Oriented Software Engineering	MCA23202	4	3	1		50	50
3	Advanced DBMS	MCA23203	4	3	1		50	50
4	Advance Internet Technologies (AIT) - Node JS & Angularjs	MCA23204	4	3	1		50	50
5	Open Elective 2 : <Elective name>	MCA23205	2	1	1		25	25
6	Value Added Course 2 : <Elective name>	MCA23206	2	1	1		25	25
7	Practical - Java Programming & AIT	MCA23207	4			4	50	50
8	Mini Project	MCA23208	4			4	50	50
TOTAL			**28**				**350**	**350**

***Note : Kindly Refer to Paper Code of** Open Elective 2 (Section 12 **) ,** Value Added Course 2 (Section 13)

MCA SECOND YEAR

Semester III								
Sr. No	**Subject Name**	**Course Code**	**Credit**	**Teaching Scheme**			**IA**	**UE**
				L	**T**	**P**		
1	Python Programming	MCA23301	4	3	1		50	50
2	Optimization Technique	MCA23302	4	3	1		50	50
3	Data Warehousing & Data Mining	MCA23303	4	3	1		50	50
4	ASP.NET using C#	MCA23304	4	3	1		50	50
5	Open Elective 3 : <Elective name>	MCA23305	2	1	1		25	25
6	Value Added Course 3 : <Elective name>	MCA23306	2	1	1		25	25
7	Practical - Python Programming & ASP.NET using C#	MCA23307	4			4	50	50
8	Mini Project	MCA23308	4			4	50	50
TOTAL			**28**				**350**	**350**

***Note : Kindly Refer to Paper Code of** Open Elective 3 (Section 12 **) ,** Value Added Course 3 (Section 13)

MCA SECOND YEAR

Semester IV								
Sr. No	**Subject Name**	**Course Code**	**Credit**	**Teaching Scheme**			**IA**	**UE**
				L	**T**	**P**		
1	Knowledge Representation- Artificial Intelligence – ML - DL	MCA23401	4	3	1		50	50
2	Mobile Application Development	MCA23402	4	3	1		50	50
3	Software Project Management	MCA23403	4	3	1		50	50
4	Software Testing and Quality Assurance	MCA23404	4	3	1		50	50
5	Practical - KRAI & MAD Lab	MCA23405	4			4	50	50
6	Project	MCA23406	8			12	100	100
TOTAL			**28**				**350**	**350**

11. List of Multi-Disciplinary Courses / List of Professional Certification Short Term/Skill Based Courses

Sr. No	**Name of The Courses**
1	Data Science Using Python
2	Angular JS
3	Codignator
4	Big Data Administration
5	Big Data Development
6	DevOps
7	Laravel
8	Certificate Course in Stock Market
9	HR Analytics
10	SAS (Statistical Analysis System)
11	Marketing Analytics
12	Web Analytics

Note: Professional Certification Short Term/Skill Based Courses will be added and modified as per the requirement

12 List of Open Course Elective:

Course Code	Semester I	Course Code	Semester II	Course Code	Semester III
MCA231051	Linux System Administration	MCA232051	Business Intelligence Tool	MCA233051	Speech Recognition
MCA231052	MVC Framework	MCA232052	IT infrastructure Devops	MCA233052	NLP - Text Mining
MCA231053	CMS – (WordPress /Joomla)	MCA232053	Cloud Computing	MCA233053	R Programming
MCA231054	Applied Statistical Methods	MCA232054	Data Science using Python	MCA233054	Robotic Process Automation (RPA)
MCA231055	Data Privacy and Protection	MCA232055	Database Administration (Oracle/ MYSQL)	MCA233055	Digital Image processing
MCA231056	SQL, PL/SQL	MCA232056	Block Chain Technology	MCA233056	Big Data
MCA231057	NoSQL (MongoDB)	MCA232057	IoT & Smart Technologies	MCA233057	Image processing
MCA231058	Network Security	MCA232058	Cyber Security	MCA233058	Generative AI

13. List of Value added Course :

Course Code	Semester I	Course Code	Semester II	Course Code	Semester III
MCA231061	Research Methodology-1	MCA232061	Data Analysis using Spreadsheet	MCA233061	Research Methodology-2
MCA231062	Soft Skill -1	MCA232062	Problem Solving Skills	MCA233062	Soft Skill -3
MCA231063	Environment Sustainable Development	MCA232063	Soft Skill -2	MCA233063	Digital Marketing
MCA231064	Indian Knowledge System	MCA232064	Entrepreneurship & Innovation	MCA233064	Principle of Management and Organizational Behavior

14. Examination:

An institute should keep candidates continuously occupied and preparing their subjects. Institutes have continuous evaluation based on portion completed in a month and at the end of semester summative evaluation should be conducted.

14.1 Concurrent and Continuous Evaluation (CCE)

The Concurrent and Continuous Evaluation Examinations shall be conducted at the end of each month and at the end of the semester i.e. during November and in May. Concurrent and Continuous Evaluation in the semester system (also known as internal examination is spread through the duration of course and is done by the teachers teaching the course. The Concurrent and Continuous Evaluation provides feedback on the teaching learning process. As a part of concurrent and continuous evaluation, the learners shall be evaluated on a continuous basis by the Institute to ensure that student learning takes place in a graded manner. Concurrent and continuous evaluation components should be designed in such a way that the faculty can monitor the student learning & development and intervene wherever required. The faculty must share the outcome of each concurrent evaluation component with the students, soon after the evaluation, and guide the students for betterment.

There shall be a minimum of three CCE components per full credit course. The faculty shall announce in advance the units based on which each concurrent evaluation shall be conducted. Each component shall ordinarily be of 25 marks. The Institute shall however have the liberty to conduct additional components (beyond three).

Detailed record of the Concurrent and Continuous Evaluation shall be maintained by the Institute. The same shall be included in final internal marks.

14.2 Methodology to perform CCE:

1. Individual Activity
2. Group Activity
3. Case Study
4. Written Test
5. Open Book Test
6. Field Visit
7. Small Group Project & Internal Viva-Voce
8. Group Discussion
9. Role Play / Story Telling
10. Presentation
11. Written Home Assignment
12. Viva
13. MCQ Quiz
14. Literature Review / Book Review

14.3 Safeguard for Credibility of Concurrent and Continuous Evaluation

CCE results should be communicated to students after every CCE with the suggestion where improvement is needed.

To keep transparent and value added evaluation, the institute should involve external examiners, industry experts and Alumni.

15. SCHEME OF EXAMINATION:

For some courses there is Internal Assessment (IA) conducted by the respective institutes as well as a University Examination (UE) at the End-of-the Term. UE will be conducted out of 50 marks and IA will be conducted for 50 marks then these are converted to grade points and grades as per the Table I. For courses having only Continuous Assessment (CA) the respective institutes will evaluate the students in varieties of ways, three or four times, during the term for a total of 100 marks. Then the marks will be converted to grade points and grades using Table I.

16. PASSING CRITERIA

Every student must secure a minimum of 40% marks for each subject in End Semester examination & Internal Assessment for passing in the respective subject.

The student must secure a minimum of 4.0 grade point (P: Pass) in each paper. A student who secures less than 4.0 grade point (39% or less marks) will be declared 'Fail' in that paper (subject) and shall be required to reappear for respective paper.

A student who fails in University Examination (Theory) and passed in Internal Assessment of the same paper (subject) shall be given FC Grade (Failed in Semester Examination) Such student will have to reappear for University Examination Only.

A student who fails in Internal Assessment and passes in university examination (Theory) shall be given FR Grade (Failed in Internal Assessment) . Such students will have to re-appear for the Internal Assessment only.

The 10 point Grades and Grade Points according to the following table I:

Marks	Garde	Grade Points
80-100	O : Outstanding	10
70-79	A+ : Excellent	9
60-69	A : Very Good	8
55-59	B+ Good	7
50-54	B : Above Average	6
45-49	C : Average	5
40-44	P : Pass	4
0-39	F : Fail	0
	AB : Absent	

17. Backlog :
Candidates should secure 40% marks in each subject. Less than 40% marks will be considered backlog in the subject. Minimum 50% number of subjects should be cleared at the end of year

18. Board of Paper Setters /Examiners:
For each Semester and examination there will be one board of Paper setters and examiners for every course. While appointing paper setter /examiners, care should be taken to see that there is at least one person specialised in each unit course.

19. Class
The performance of a student will be evaluated in terms of two indices, viz.
a) Semester Grade Point Average (SGPA) which is the Grade Point Average for a semester
b) Cumulative Grade Point Average (CGPA) which is the Grade Point Average for all the completed semesters at any point in time.

Semester Grade Point Average (SGPA): At the end of each semester, SGPA is calculated as the weighted average of GPI of all courses in the current semester in which the student has passed, the weights being the credit values of respective courses.

SGPA = Grade Points divided by the summation of Credits of all Courses.

$$\sum \{C * GPI\}$$

$$SGPA = \frac{\sum \{C * GPI\}}{\sum C} \text{ for a semester.}$$

Where GPI is the Grade and C is credit for the respective Course.
Award of Grade Cards: The Dr. P. A. Inamdar University under its seal shall issue to the learners a grade card on completion of each semester. The final Grade Card issued at the end of the final semester shall contain the details of all courses taken during the entire programme for obtaining the degree.

Final Grades: After calculating the SGPA for an individual semester and the CGPA for entire programme, the value shall be matched with the grade in the Grade Points & Descriptors Table as per the Points Grading System and expressed as a single designated GRADE (as per Table II)

Student who secures grade P or above in a course is said to have completed /earned the credits assigned to the course. A student who completed the minimum credits required for the MCA programme shall be declared to have completed the programme.

20. Medium of Instruction:

The medium of Instruction will be English.

21. Attendance
For the term to be granted, the student must fulfil the requirement of 75% attendance in each semester in each subject. If the aforementioned condition is not met, the Director/Dean shall have the authority to prevent the student from appearing for an examination of a particular course.

22. ATKT rules

A student is allowed to keep their term in all 4 semesters.

A student will not be awarded a degree unless he/she has passed all subjects of all the semester examinations.

23. Maximum Duration for completion of the Programme:

The candidates must complete the MCA programme by accumulating the necessary credits WITHIN 4 YEARS after the entrance date. If a student does not pass all of the credits within a total of four years, they will ultimately be judged to have failed. Such students will then need to reapply for admission in accordance with the criteria in effect at that time.

24. Class Improvement

(1) A candidate who has reapplied for the mentioned examination(s) in accordance with the provisions of this Ordinance shall have his or her performance at such reappearance discarded if the candidate's class or grade does not improve.

(2) Within five years of the date that the candidate passed the Master's degree examination, the candidate will be permitted to re-appear the Examination for Improvement of Class/Grade.

(2) A candidate must repeat at least one-third (⅓) and up to all of the university's theory courses at the time the class is awarded.

(3) A candidate will have a maximum of three chances within the allotted five years to enhance his or her class or grade.

(4) A candidate who seeks class improvement is not eligible to get the benefit policy of the university that allows for exceptions.
(5) No reward, prize, medal, scholarship, or other honour may be given to a candidate who shows an

improvement in their class or grade.

(6) A candidate who desires to apply for improvement of class/grade should submit his/her examination application form for improvement of class from the Department of Üniversity / Recognised Institution from which he/she has obtained the original degree also

(8) A candidate who has reappeared for the class improvement examination and improves his/her class/grade by such re-appearance, will have to surrender his/her original degree, statement of marks and passing certificate etc. to the University.

In the revised degree certificate, statement of marks and passing certificate, which will be issued to the candidate, mention will be made of the fact that he/she has improved his/her class grade by reappearing for class improvement.

25 MCA Program L-T-P Pattern and Choice based Credit elective Course - Semester I :

Teaching-Learning Activity	**No. of Hours / Credit**	Type of the Course	Number of Subject*Credit*Nos of Number = Total hours
Lectures	18	**Core**	**4 *4*1 = 16**
		Open Course Elective	**1*1*1 = 1**
		Value Added Course	**1*1*1=1**
Tutorials	**6**	**Core**	**4*1*1=4**
		Open Course Elective	**1*1*1 = 1**
		Value Added Course	**1*1*1=1**
Practical / Seminar / Project / Internship / Field Practice / Community Engagement / Studio Activities	**16**	**Practical Work**	**1*4*2=8**
		Project Work	**1*4*2=8**

Semester II

Teaching-Learning Activity	**No. of Hours / Credit**	Type of the Course	Number of Subject*Credit*Nos of Number = Total hours
Lectures	**18**	**Core**	**4 *4*1 = 16**
		Open Course Elective	**1*1*1 = 1**
		Value Added Course	**1*1*1=1**
Tutorials	**6**	**Core**	**4*1*1=4**
		Open Course Elective	**1*1*1 = 1**
		Value Added Course	**1*1*1=1**
Practical / Seminar / Project / Internship / Field Practice / Community Engagement / Studio Activities	**16**	**Practical Work**	**1*4*2=8**
		Project Work	**1*4*2=8**

Semester III

Teaching-Learning Activity	**No. of Hours / Credit**	Type of the Course	Number of Subject*Credit*Nos of Number = Total hours
Lectures	**18**	**Core**	**4 *4*1 = 16**
		Open Course Elective	**1*1*1 = 1**
		Value Added Course	**1*1*1=1**
Tutorials	**6**	**Core**	**4*1*1=4**
		Open Course Elective	**1*1*1 = 1**

		Value Added Course	**1*1*1=1**
Practical / Seminar / Project / Internship / Field Practice / Community Engagement / Studio Activities	**16**	**Practical Work**	**1*4*2=8**
		Project Work	**1*4*2=8**

Semester IV

Teaching-Learning Activity	**No. of Hours / Credit**	Type of the Course	Number of Subject*Credit*Nos of Number = Total hours
Lectures	**16**	**Core**	**4 *4*1 = 16**
Tutorials	**4**	**Core**	**4*1*1=4**
Practical / Seminar / Project / Internship / Field Practice / Community Engagement / Studio Activities	**24**	**Practical Work**	**1*4*2=8**
		Project Work	**1*8*2=16**