Your Dreams Our Goal

POORNIMA UNIVERSITY

Member of Association of Indian Universities & Approved by UGC (Govt. of India) under 2(f) & 12(B)

FACULTY OF COMPUTER SCIENCE & ENGINEERING

EPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCHEME & SYLLABUS BOOKLET

MCA(AI & DS). BATCH 2022-2024

MCA
(Artificial Intelligence and Data Science)

SCHEME & SYLLABUS

BATCH: 2022-24

INDEX

Disclaimer: The scheme, syllabus and other materials published in this booklet may be changed or modified as per the requirement after approval of competent authority. The decision taken by the management of Poornima University will be final and abiding to all.

Student Details

Name of Student:

Name of Program:

Semester: Year: Batch:

Faculty of:

Your Dreams Our Goal

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VISION

To create knowledge-based society with scientific temper, team spirit and dignity of labor to face global competitive challenges.

Mission

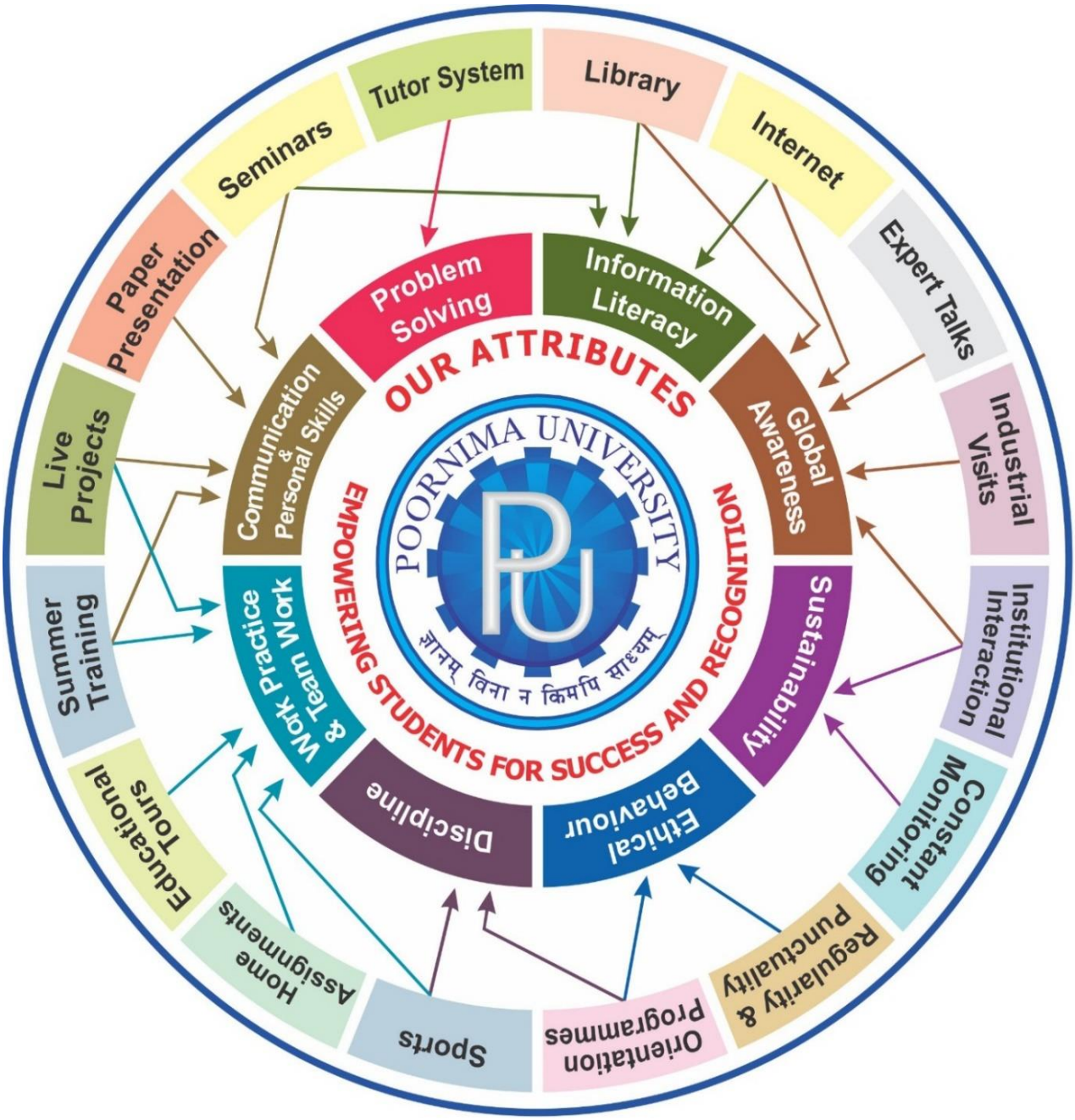
To evolve and develop skill-based systems for effective delivery of knowledge so as to equip young professionals with dedication and commitment to excellence in all spheres of life.

Quality Policy

To provide Quality Education through Faculty development, updating of facilities and continual improvement meeting University norms and keeping stake holders satisfied.

Knowledge Wheel

At Poornima, the academic atmosphere is a rare blend of modern technical as well as soft skills and traditional systems of learning processes.



About Program and Program Outcomes (PO):

Title of the Programme: Master of Computer Applications (MCA)

Nature of the Programme: MCA is two-year full-time programme.

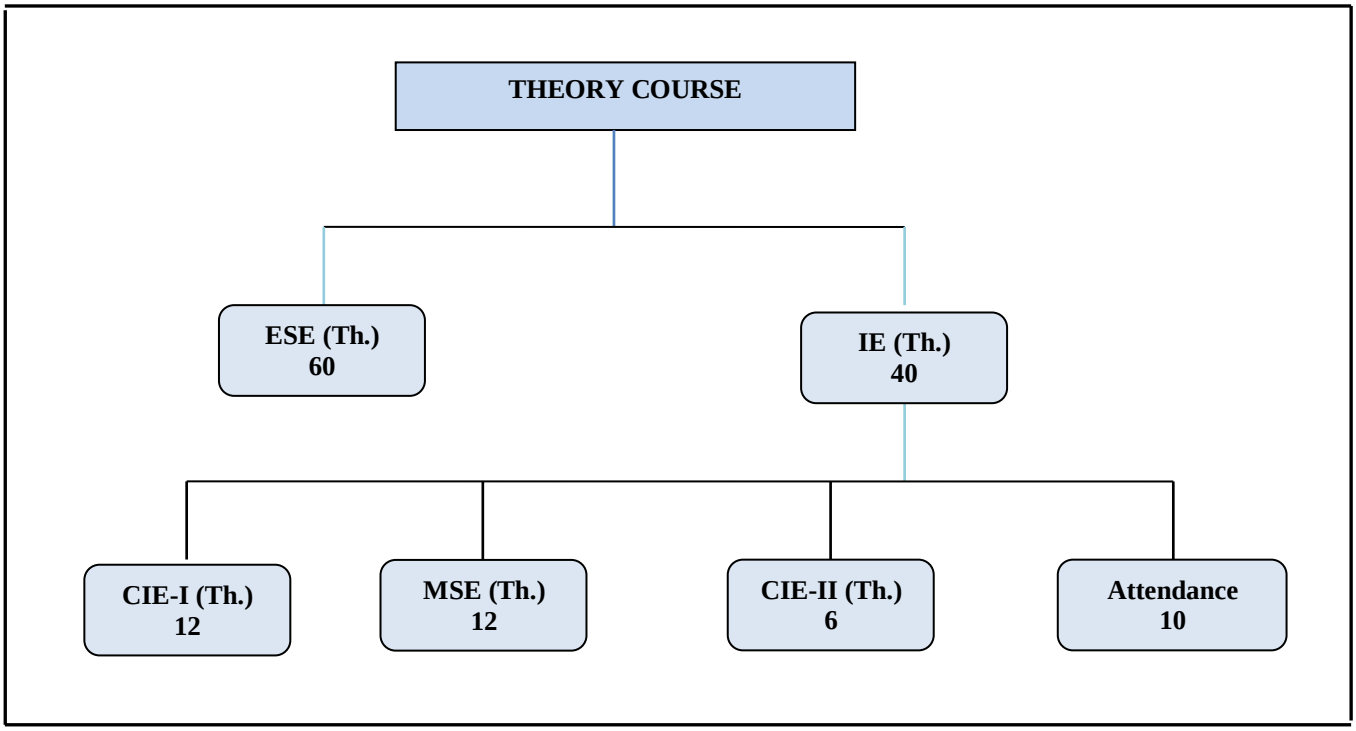
Program Outcomes (PO) :

Engineering Graduates will be able to:

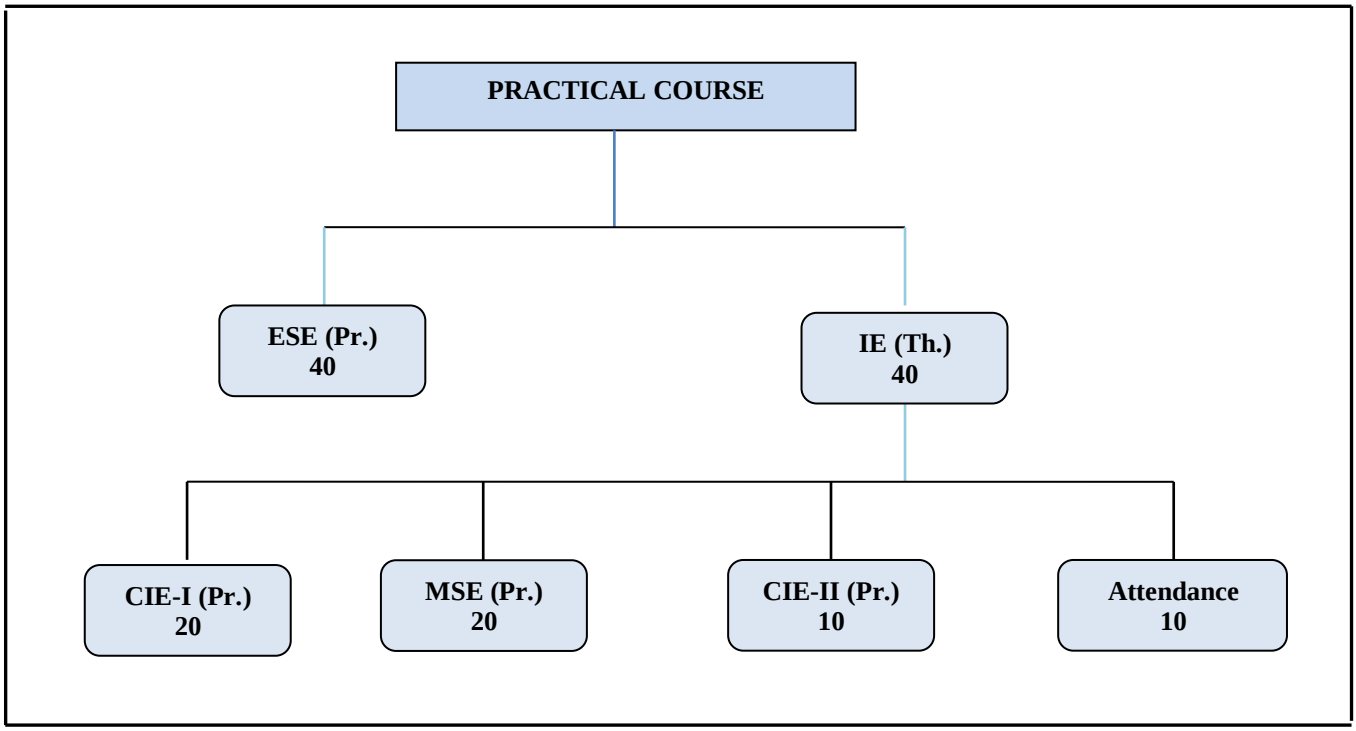
1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex 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.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **Project management and finance:** Demonstrate knowledge and understanding of the 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.
12. **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.

Examination System:

A. Marks Distribution of Theory Course:



B. Marks Distribution of Practical Course :



Th. : Theory, **Pr.** : Practical, **ESE:** End Semester Examination, **MSE:** Mid Semester Examination, **CIE:** Continuous Internal Evaluation.

Guidelines for Marks Distribution of Attendance Component		
S No.	**Total Course Attendance (TCA) range in Percentage**	**Marks allotted (out of 10)**
1	95% ≤ TCA	10
2	90% ≤ TCA < 95%	9
3	85% ≤ TCA < 90%	8
4	80% ≤ TCA < 85%	7
5	70% ≤ TCA < 80%	6
6	60% ≤ TCA < 70%	5
7	50% ≤ TCA < 60%	4
8	40% ≤ TCA < 50%	3
9	30% ≤ TCA < 40%	2
10	20% ≤ TCA < 30%	1
11	TCA < 20%	0

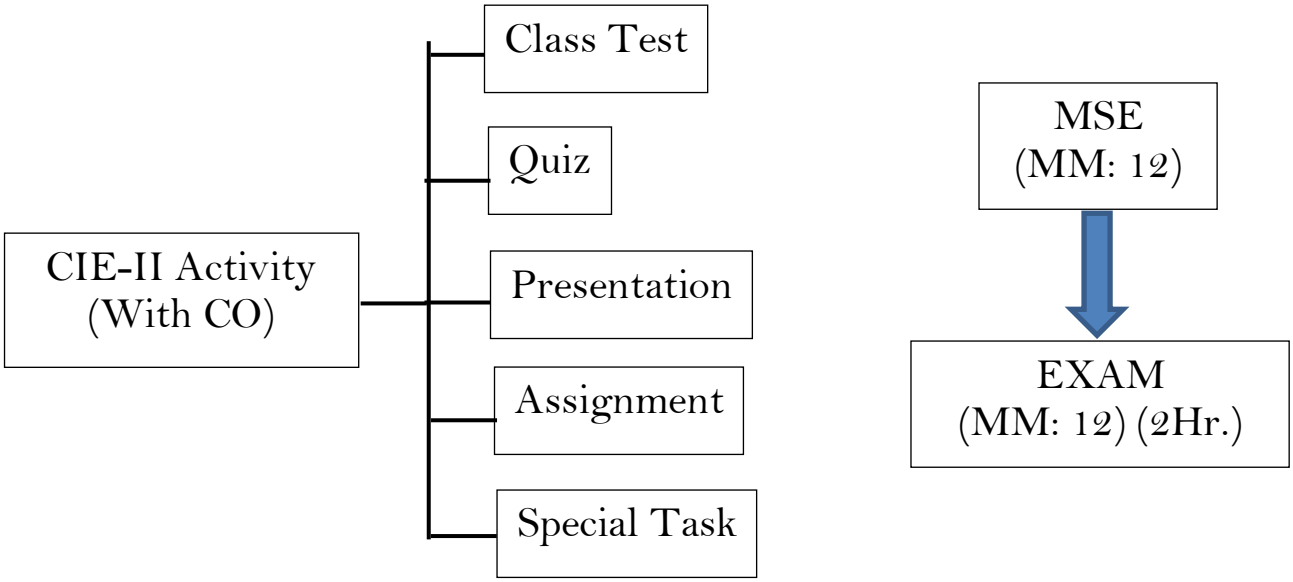
CO Wise Marks Distribution:

	Theory Subject		Practical/ Studio Subject	
	Maximum Marks	**CO to be Covered**	**CO to be Covered**	**Maximum Marks**
CIE-I (Class Test)	12 (6 + 6)	1 & 2	1 & 2	20 (10 + 10)
MSE	12 (6 + 6)	3 & 4	3 & 4	20 (10 + 10)
CIE-II (Activity/ Assignment)	6 (6)	5	5	10 (10)
Attendance	10	-	-	10
ESE	60	-	-	40
TOTAL	100	-	-	100

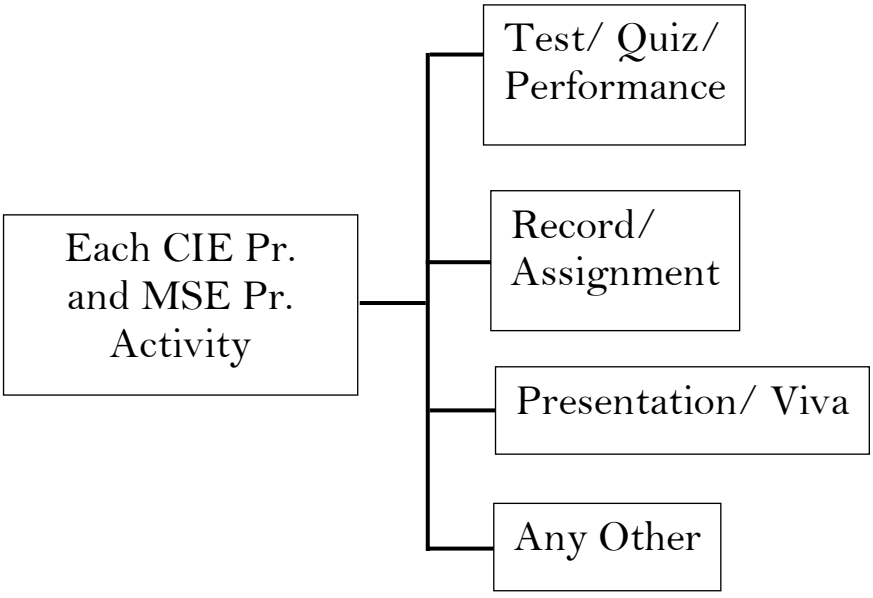
Minimum Passing Percentage in All Exams:

S. No.	Program	Minimum Passing Percentage in All Exam	
		ESE Component	Total Component
1	Course Work for Ph. D Registration	----------	**50 %**
2	B. Arch.	45 %	**50 %**
3	MBA, MHA, MPH, MCA, M. Tech., M. Plan. and M. Des.	40 %	40 %
4	B. Tech., B. Des., BCA, B.Sc., BVA, B. Voc., BBA, B.Com., B.A. and Diploma	35 %	40 %
5	B. Sc. (Hospitality & Hotel Administration)	35 %	40 % (Theory) & 50 % (Practical)

Break-up of Internal Exam (Theory):



Break-up of Internal Exam (Practical):



Assessment & Grade Point Average: SGPA, CGPA:

SGPA Calculation

$$\text{SGPA} = \frac{C_1G_1+C_2G_2+\cdots\ldots\ldots\ldots\ldots C_nG_n}{C_1+C_2+\cdots\ldots\ldots\ldots\ldots C_n}$$

$\text{SGPA} = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$	Where (as per teaching Scheme & Syllabus) : C_i is the number of Credits of Courses i, G_i is the Grade Point for the Course i and i = 1, 2…….n n = number of courses in a programme in the Semester

CGPA Calculation

$$\text{CGPA} = \frac{C_1G_1+C_2G_2+\cdots\ldots\ldots\ldots\ldots C_nG_n}{C_1+C_2+\cdots\ldots\ldots\ldots\ldots C_n}$$

$\text{CGPA} = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$	Where (as per teaching Scheme & Syllabus) : C_i is the number of Credits of Courses i, G_i is the Grade Point for the Course i and i = 1, 2…….n n = number of courses in a programme of all the Semester up to which CGPA is computed.

Grading Table:

Grading Table-A: For B.Arch. and course work for Ph.D. Registration

Academic Performance	Grade	Grade Point	Marks Range (in %)
Outstanding	A+	10	$90 \le x \le 100$
Excellent	A	9	$80 \le x < 90$
Very good	B+	8	$70 \le x < 80$
Good	B	7	$60 \le x < 70$
Average	C	6	$50 \le x < 60$
Fail	F	0	$x<50$

Grading Table-B: For all courses except B.Arch. and course work for Ph.D. Registration

Academic Performance	Grade	Grade Point	Marks Range (in %)
Outstanding	A+	10	$90 \le x \le 100$
Excellent	A	9	$80 \le x < 90$
Very good	B+	8	$70 \le x < 80$
Good	B	7	$60 \le x < 70$
Average	C	6	$50 \le x < 60$
Satisfactory	D	5	$40 \le x < 50$
Fail	F	0	$x<40$

Calculation of SGPA	$SGPA = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$
$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + \ldots\ldots\ldots + C_nG_n}{C_1 + C_2 + \ldots\ldots + C_n}$	

Calculation of CGPA	$CGPA = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$
$\text{CGPA} = \frac{C_1G_1 + C_2G_2 + \ldots\ldots\ldots + C_nG_n}{C_1 + C_2 + \ldots\ldots + C_n}$	

where (as per teaching scheme & syllabus): C_i is the number of credits of subject i, G_i is the Grade Point for the subject I and i = 1 to n, n = number of subjects in a course in the semester

Award of Class:

CGPA	Equivalent Division
7.50 ≤ CGPA	First Division with Distinction
6.50 ≤CGPA < 7.50	First Division
5.50 ≤CGPA < 6.50	Second Division
4.50 ≤CGPA < 5.50	Pass Class

The multiplication factor for conversion of CGPA to percentage is Equivalent % of Marks = (CGPA-0.5) x 10.

For Example if CGPA = 5.5 then % is (5.5-0.5) x 10 = 50%.

Guidelines for MOOC COURSES:

1. Applicable from the session 2020 – 21 onwords, for students aspiring for HONOURS Degree.
2. The UGC has issued UGC (Credit Framework for Online Learning Courses) Regulation, 2016. These shall apply to all universities established or incorporated by or under a Central Act, a Provincial Act, or a State/Union Territory Act and all institutions recognized by or affiliated to such Universities and all institutions deemed to be universities under Section 3 of the UGC Act, 1956.
3. All India Council for Technical Education (AICTE) has introduced Model Curriculum for Bachelor programs of 4 years/ 3 Years, and additional credits will be required to be done for the degree of Bachelor program with Honours. These additional credits will have to be acquired with online courses (MOOCs) as per AICTE.
4. This creates an excellent opportunity for students to acquire the necessary skill set for employability through massive online courses where the rare expertise of world famous experts from academics and industry are available.
5. Students are required to complete additional credits through MOOCs within 4 years/ 3years of time (whatever be applicable time for the completion of registered program) so as to become eligible for Honours degree as per norms.
6. It is necessary to complete minimum MOOCs credit course as mentioned below for becoming eligible for the Honours degree in the registered program.
7. MOOC Course Credits shall be calculated as per details given below:
8. Student are required to give the prior information about MOOCs courses to his respective HOD and COE, in which he/she wants to register for online certification.
9. After getting permission from respective HOD, a student can register for the MOOC certification courses.

10. After successful completion of the said MOOC course, the student shall submit the certificate of completion to the respective department. If he/ she fails to provide the certificates of MOOC courses before last teaching day of the semester then these certificates will not be considered later.

Required credits for Honours:

S. No	Program Duration	Required credits for Honours
1.	2- Year	10- Credits
2.	3- Year	15- Credits
3.	4-Year	20- Credits

S. No	NPTEL/ SWAYAM Course duration (in weeks)	Equivalent Credits
1	4	2
2	8	3
3	12	4

Attached Items:

Open Elective Booklet	Annexure-1
Soft Skills Booklet	Annexure-2
Value Added Course Booklet	Annexure-3

Master of Computer Applications

with specialization

Artificial Intelligence and Data Science

Scheme

Batch 2022-24

POORNIMA UNIVERSITY, JAIPUR								
Faculty of Computer Science and Engineering								
Department of Computer Science and Application								
Name of Program: MCA (Artificial Intelligence & Data Science)							**Batch: 2022-24**	
Teaching Scheme for First Year - First Semester								
Course Code	**Course Name**	**Teaching Scheme (Hrs. per Week)**			**Marks Distribution**			**Credit**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
MCDCCA1101	Fundamentals of Artificial Intelligence and Data Science	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACSA1102	Foundations of Mathematics	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA1103	Data Structure and Algorithm	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA1104	Web Technologies	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA1105	Python Programming	**3**	**-**	**-**	**40**	**60**	**100**	**3**
B.2	**Practical**							
MCACCA1201	Programming in C Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA1202	Data Structure and Algorithm Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA1203	Web Technologies Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA1204	Python Programming Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA1205	Linux Shell Programming Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
C.	**Department Elective**							
MCAECA1111	Computer Graphics and Multimedia	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCAECA1112	Data Mining and Data Warehouse							
MCAECA1113	Information System Security							
D.	**Open Elective: Anyone**							
	Nil							
E.	**Humanities and Social Sciences including Management courses OR Ability Enhancement Compulsory Course (AECC)**							
MULCHU1201	Personality Development & Emotional Intelligence	**-**	**-**	**2**	**60**	**40**	**100**	**1**
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
	Nil							
G.	**Discipline, VAC & Social Outreach**							
MCACCA1601	Talent Enrichment Program (TEP)	**-**	**-**	**1**	**50**	**-**	**50**	**1**
	Library / MOOC / Online Certification Courses	**-**	**-**	**1**				
	Non Syllabus Project / Industrial Visit / CRT	**-**	**-**	**1**				
	Total Hours	**18**	**-**	**15**				
	Total Teaching Hours	**33**						**25**

POORNIMA UNIVERSITY, JAIPUR								
Faculty of Computer Science and Engineering								
Department of Computer Science and Application								
Name of Program: MCA (Artificial Intelligence & Data Science)							**Batch: 2022-24**	
Teaching Scheme for First Year – Second Semester								
Course Code	**Course Name**	**Teaching Scheme (Hrs. per Week)**			**Marks Distribution**			**Credit**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
MCDCCA2101	Machine Learning	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCDCCA2102	Data Science and Analytics	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA2103	OOPs with Java	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA2104	Design & Analysis of Algorithms	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA2105	RDBMS	**3**	**-**	**-**	**40**	**60**	**100**	**3**
B.2	**Practical**							
MCDCCA2201	Machine Learning Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCDCCA2202	R Programming Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA2203	OOPs with Java Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA2204	RDBMS Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
C.	**Department Elective**							
MCAECA2111	Internet of Things	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCAECA2112	Soft Computing							
MCAECA2113	Internet and Database Security							
D.	**Open Elective: Anyone**							
	As Per Annexure-I	**2**	**-**	**-**	**40**	**60**	**100**	**2**
E.	**Humanities and Social Sciences including Management courses OR Ability Enhancement Compulsory Course (AECC)**							
MULCHU2201	Spoken English & Communication Skills I	**-**	**-**	**2**	**60**	**40**	**100**	**1**
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
	Nil							
G.	**Discipline, VAC & Social Outreach**							
MCACCA2601	Talent Enrichment Program (TEP)	**-**	**-**	**1**	**50**	**-**	**50**	**1**
	Library / MOOC / Online Certification Courses	**-**	**-**	**1**				
	Non Syllabus Project / Industrial Visit / CRT	**-**	**-**	**1**				
	Total Hours	**20**	**-**	**13**				
	Total Teaching Hours	**33**						**26**

POORNIMA UNIVERSITY, JAIPUR								
Faculty of Computer Science and Engineering								
Department of Computer Science and Application								
Name of Program: MCA (Artificial Intelligence & Data Science)							**Batch: 2022-24**	
Teaching Scheme for Second Year - Third Semester								
Course Code	**Course Name**	**Teaching Scheme (Hrs. per Week)**			**Marks Distribution**			**Credit**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
MCDCCA3101	NLP and Computer Vision	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCDCCA3102	Deep Learning and ANN	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA3103	Cloud Computing	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA3104	Operating System	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCACCA3105	Computer Networks and Data Communication	**3**	**-**	**-**	**40**	**60**	**100**	**3**
B.2	**Practical**							
MCDCCA3201	NLP and Computer Vision Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCDCCA3202	Data Visualization Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
MCACCA3203	Cloud Computing Lab	**-**	**-**	**2**	**60**	**40**	**100**	**1**
C.	**Department Elective**							
MCAECA3111	Mobile Application Development	**3**	**-**	**-**	**40**	**60**	**100**	**3**
MCAECA3112	Big Data Analytics							
MCAECA3113	Blockchain Technology							
D.	**Open Elective: Anyone**							
	As Per Annexure-I	**2**	**-**	**-**	**40**	**60**	**100**	**2**
E.	**Humanities and Social Sciences including Management courses OR Ability Enhancement Compulsory Course (AECC)**							
MULCHU3201	Spoken English & Communication Skills II	**-**	**-**	**2**	**60**	**40**	**100**	**1**
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
MCACCA3501	Industrial Training Seminar	**-**	**-**	**2**	**60**	**40**	**100**	**1**
G.	**Discipline, VAC & Social Outreach**							
MCACCA3601	Talent Enrichment Program (TEP)	**-**	**-**	**1**	**50**	**-**	**50**	**1**
	Library / MOOC / Online Certification Courses	**-**	**-**	**1**				
	Non Syllabus Project / Industrial Visit / CRT	**-**	**-**	**1**				
	Total Hours	**20**	**-**	**13**				
	Total Teaching Hours	**33**						**26**

POORNIMA UNIVERSITY, JAIPUR								
Faculty of Computer Science and Engineering								
Department of Computer Science and Application								
Name of Program: MCA (Artificial Intelligence & Data Science)							**Batch: 2022-24**	
Teaching Scheme for Second Year - Fourth Semester								
Course Code	**Course Name**	**Teaching Scheme (Hrs. per Week)**			**Marks Distribution**			**Credit**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
	Nil							
B.2	**Practical**							
	Nil							
C.	**Department Elective**							
	Nil							
D.	**Open Elective: Anyone**							
	Nil							
E.	**Humanities and Social Sciences including Management courses OR Ability Enhancement Compulsory Course (AECC)**							
	Nil							
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
MCACCA4301	Project / Internship	**-**	**-**	**22**	**60**	**40**	**100**	**11**
G.	**Discipline, VAC & Social Outreach**							
MCACCA4601	Talent Enrichment Program (TEP)	**-**	**-**	**1**	**50**	**-**	**50**	**1**
	Library / MOOC / Online Certification Courses	**-**	**-**	**1**				
	Non Syllabus Project / Industrial Visit / CRT	**-**	**-**	**1**				
	Total Hours	**-**	**-**	**33**				
	Total Teaching Hours	**33**						**12**