MANIPAL
UNIVERSITY JAIPUR
(University under Section 2(f) of the UGC Act)

Handbook of Information

Department of Data Science & Engineering
Academic Year: 2023-24
Odd Semester

Department of Data Science & Engineering
School of Information Technology
Faculty of Engineering

Manipal University Jaipur, Jaipur

Table of Contents

1. About Department

Department of Data Science & Engineering started in year 2022, in accordance with the resolution passed in the 12th meeting of the Executive Committee for bifurcation of School of Information Technology as two departments – 'Department of IT' and 'Department of Data Science & Engineering', with a vision to prepare the next generation practitioners and researchers with human values and professional ethics. It aims to produce skilled professionals and leaders in a data-centric world having combined technical and statistical skills to fetch extraordinary insights out of ordinary data. It provides strong theoretical fundamentals, hands on to various data science related tools and technologies, and mathematical concepts to solve complex problems in real world.

Highlights

- State-of-the-art Cognitive Intelligence & Data Computing Research Lab equipped with Electroencephalogram Server.
- Memorandum of Understanding signed with many leading universities and industry to facilitate students with latest technologies and to make them industry ready.
- Curriculum keeps synchronization with the latest industry demands aided by program electives.
- Electives can be chosen by students to specialize in any of chosen vertical of computing domain.
- Open Electives from other fields to broaden a student's perspective and technical acumen for their overall growth.
- Industry visits for students to get industrial perspective and product development experiences.
- Emphasis on project-based learning by emphasizing more hands-on, lab projects and research work.
- Professional Chapters - Association for Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), ACM's Council on Women in Computing (ACM-W) and IEEE Women in Engineering (WIE) chapters.
- Project Based Learning.
- Industry Certifications.
- Quarterly/ Monthly Coding challenges, hackathons and competitions under ACM and IEEE Student Branch.
- Placement's assistance (Mock Drives/Interviews).
- Students' involvement and mentorship for various coding challenges and competitions.
- Research seminars and workshops for students organized time to time.

Vision

- To prepare the next generation practitioners and researchers with human values and ethics to thrive in a data-centric world.

Mission

- To establish the department as the epitome of motivation and guidance among the aspiring engineers.
- To nurture academic, research, and professional excellence in the domain of Data Science and engineering.
- To transform young learners into competent data engineers by inculcating holistic values

Programme Educational Objectives

[PEO.1]. Acquire and improve data science abilities to compete in a potential job as a data scientist and analyst.

[PEO.2]. Establish entrepreneurial skills to provide new and scalable solutions for tackling real-life complex data processing methodologies, paving the way for startups and self-employment.

[PEO.3]. Pursue higher studies to carry out research and development in the fields of advanced data science and artificial intelligence.

[PEO.4]. Integrate sensitivity towards all facets of ethical, environmental, and social concerns with holistic development.

Career Opportunities

The University's placement cell, industry collaborators, and alumni network facilitate placement and internships as data scientists, data analysts, and data engineers. The course targets placements and internships in top data science companies like CapGemini, Cartesian Consulting, Oracle, Publicis Sapient, Wipro Ltd. and in domains such as finance, business, economics, and healthcare. The Institution has also tied up with foreign universities and promotes a semester abroad. Following are some of the key roles being offered to the students of Data Science & Engineering:

- Data Scientist
- Data Analyst
- Data Engineer
- Data Mining Engineer
- Data Architect
- Data Statistician
- Project Manager

2. Quick Facts about Department

Total International MoU's: 02

Total Industrial MoU's: 02

Total no. of Faculty Members: 15

No. of Faculty Members with Ph.D.: 10

% of faculty with Ph.D.: 66.7%

3. Faculty Members

S. No.	Name	Designation	Qualification
1	Dr. Akhilesh Kumar Sharma	Professor & Head	Ph.D.
2	Dr. Sukhwinder Sharma	Associate Professor	Ph.D.
3	Dr. Dinesh Sharma	Associate Professor	Ph.D.
4	Dr. Rekha Chaturvedi	Assistant Professor (Selection Grade)	Ph.D.
5	Dr. Aprna Tripathi	Assistant Professor (Selection Grade)	Ph.D.
6	Dr. Chirag Joshi	Assistant Professor (Selection Grade)	Ph.D.
7	Dr. Neha V Sharma	Assistant Professor (Senior Scale)	Ph.D.
8	Dr. Sudhir Sharma	Assistant Professor (Senior Scale)	Ph.D.
9	Dr. Ginika Mahajan	Assistant Professor (Senior Scale)	Ph.D.
10	Mr. Deevesh Choudhary	Assistant Professor (Senior Scale)	M. Tech.
11	Mr. Gaurav Kumawat	Assistant Professor (Senior Scale)	M. Tech.
12	Mr. Abhishek Dwivedi	Assistant Professor (Senior Scale)	M. Tech.
13	Dr. Shipra Shukla	Assistant Professor	Ph.D.
14	Ms. Shweta Anand Redkar	Assistant Professor	M. Tech.
15	Ms. Shatabdi Basu	Assistant Professor (Adhoc)	M. Tech.

4. University/ Departmental Academic Calander

5. Programs Offered

The department offers one undergraduate programme - B.Tech. in Computer Science & Engineering (Data Science) from Academic Year 2023-24 onwards. The programme curriculum is revamped from B.Tech. (Data Science and Engineering) to B.Tech. in Computer Science & Engineering (Data Science) to provide better learning and career opportunities to the aspiring candidates.

B.Tech. in Computer Science and Engineering (Data Science) programme is designed to provide a real blend of computer architectures, computational mathematics, statistics and data science tools and technologies. As more and more data are being produced by modern applications, the data science market is offering challenging opportunities to engineering students in understanding, developing, and implementing data driven applications and technologies. This programme is becoming a promising platform for students inspired to become better trained professionals to cater the growing demand for data scientists and engineers in industry. The programme trains engineering students to be skilled Data Scientists. Additionally, the programme places a significant emphasis on students gaining experiential learning through hands-on practical sessions in labs to solve complex real-world problems.

Programme Outcomes (POs)

[PO.1]. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

[PO.2]. Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences

[PO.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

[PO.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

[PO.5]. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

[PO.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

[PO.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

[PO.8]. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practices

[PO.9]. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

[PO.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

[PO.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

[PO.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

Programme-specific Outcomes (PSOs)

At the end of the program, the students will be able to

[PSO.1]. Understand the role of mathematics, statistics, and AI techniques in the field of data science & engineering.

[PSO.2]. Apply the acquired knowledge and expertise to perform data analytics tasks for multidimensional data sets.

[PSO.3]. Develop effective and scalable industrial solutions for real world socio-economic problems using data analytics tools and techniques.

6. Scheme/ Curriculum of Programs Offered

Course Structure for B. Tech (Data Science and Engineering) Program from Academic Session 2020-2021

Year	FIRST SEMESTER						SECOND SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
I	MA1101	Engineering Mathematics-I	3	1	0	4	MA1201	Engineering Mathematics-II	3	1	0	4
	PY1001	Engineering Physics	3	1	0	4	CY1001	Engineering Chemistry	2	1	0	3
	CV1001	Basic Civil Engineering	2	1	0	3	EE1001	Basic Electrical Technology	2	1	0	3
	CY1002	Environmental Studies	3	0	0	3	CS1001	Problem Solving Using Computers	2	1	0	3
	EC1001	Basic Electronics	2	1	0	3	ME1001	Basic Mechanical Engineering	2	1	0	3
	ME1002	Engineering Graphics	0	0	6	3	LN1001	Communication Skills in English	2	0	0	2
	PY1030	Engineering Physics Lab	0	0	2	1	CS1030	Problem Solving Using Computers Lab	0	0	2	1
	ME1030	Workshop Practice	0	0	2	1	CY1030	Engineering Chemistry Lab	0	0	2	1
							DA1001	Experiential Learning	0	0	4	2
			13	**4**	**10**	**22**			**13**	**5**	**8**	**22**
	Total Contact Hours (L + T + P)		**27**				**Total Contact Hours (L + T + P)**		**26**			
	THIRD SEMESTER						**FOURTH SEMESTER**					
II	MA ****	Mathematical Foundations for Data Science-I	3			3	MA ****	Mathematical Foundations For Data Science-II	3			3
	HS ****	Finance & Econometrics	3			3	DS2201	Database Systems	3	1		4
	DS2101	Introduction to Data Analytics	3			3	DS2202	Machine Learning	3	1		4
	DS2102	Object Oriented Programing	3	1		4	DS2203	Design & Analysis of Algorithms	3	1		4
	DS2103	Data Structures	3	1		4	DS2204	Data Communications and Networks	3			3
	DS2104	Computer System Architecture	3			3	****	Open Elective – I	3			3
	DS2130	Data Analytics Lab			2	1	DS2230	Database Lab			2	1
	DS2131	Object Oriented Programming Lab			2	1	DS2231	Machine Learning Lab			2	1
	DS2132	Data Structures Lab			2	1	DS2232	Design & Analysis of Algorithms Lab			2	1
			18	**2**	**6**	**23**			**18**	**3**	**6**	**24**
	Total Contact Hours (L + T + P)		**26**				**Total Contact Hours (L + T + P) + OE**		**27**			
III	**FIFTH SEMESTER**						**SIXTH SEMESTER**					
	MA****	Mathematical Foundations For Data Science-III	3			3	HS ****	Operations Research	3			3
	DS3101	Deep Learning	3	1		4	DS3201	Artificial Intelligence	3	1		4
	DS3102	Operating Systems	3			3	DS3202	Parallel Programming	3	1		4
	DS3103	Natural Language Processing	3			3	DS3203	Big Data Analytics	3	1		4
	DS3104	Cloud Computing	3			3	DS3204	Data Privacy & Security	3			3
	****	Open Elective – II	3			3	****	Open Elective – III	3			3
	DS3130	Deep Learning Lab			2	1	DS3230	Artificial Intelligence lab			2	1
	DS3131	Operating Systems Lab			2	1	DS3231	Parallel Programming Lab			2	1
	DS3132	Web Technologies Lab		1	2	2	DS3232	Big Data Analytics Lab			2	1
			18	**2**	**6**	**23**			**18**	**3**	**6**	**24**

Course Structure for B. Tech (Data Science and Engineering) Program from Academic Session 2020-2021

	Total Contact Hours (L+T+P) +		26				Total Contact Hours (L + T + P) + OE		27			
IV	SEVENTH SEMESTER						EIGHTH SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
	DS41***	Program Elective - I	3			3	DS4270	Project work/ Practice School				12
	DS41***	Program Elective - II	3			3						
	DS41***	Program Elective - III	3			3						
	DS41***	Program Elective - IV	3			3						
	DS41***	Program Elective - V	3			3						
	DS41***	Program Elective - VI	3			3						
	DS4170	Industrial Training				1						
			18			19						12
	Total Contact Hours (L + T + P)		18				Total Contact Hours (L + T + P)		-			

PROGRAM ELECTIVES:

Sub. Code	Subject Name	Sub. Code	Subject Name
DS4140	Advanced Data Structures and Algorithms	DS4141	Software Engineering
DS4142	Block chain Technologies	DS4143	Internet of Things
DS4144	Quantum Computing	DS4145	Social Network Analysis
DS4146	Data Forensics	DS4147	Information Retrieval
DS4148	Soft Computing Techniques	DS4149	Enterprise Data Architecture
DS4150	Computer Vision	DS4151	Robotics & Automation
DS4152	Finance & Accounting	DS4153	Risk Analytics
DS4154	Financial Market Analytics	DS4155	Business & Economic Analytics
DS4156	Fundamentals of Business Analytics	DS4157	Digital Marketing
DS4158	Supply Chain Management	DS4159	Health Informatics
DS4160	Bioinformatics	DS4161	Medical Image Processing
DS4162	Biostatistics	DS4163	Algorithmic Trading
DS4164	Applied Econometrics		

PROGRAM ELECTIVE BASED MINOR SPECIALIZATION:

1. **Finance & Security Analytics** – DS4152, DS4153, DS4154, DS4155
2. **Business Analytics** – – DS4152, DS4156, DS4157, DS4158
3. **Health Care Analytics** – – DS4159, DS4160, DS4161, DS4162

7. List of Academic Committees & Coordinators

a. Course Coordinators

B.Tech (Data Science and Engineering)			
Semester	**Course Code**	**Course Title**	**Course Coordinator**
3rd	MA2108	Mathematical Foundations for Data Science-I	Dr. Kalpana Sharma
3rd	BB1640	Finance and Econometrics	Dr. C. Anirvinna
3rd	DS2101	Introduction to Data Analytics	Dr. Ginika Mahajan
3rd	DS2102	Object Oriented Programing	Ms. Shweta Redkar
3rd	DS2103	Data Structures	Dr. Shipra Shukla
3rd	DS2104	Computer System Architecture	Dr. Aprna Tripathi
3rd	DS2130	Data Analytics Lab	Dr. Ginika Mahajan
3rd	DS2131	Object Oriented Programming Lab	Ms. Shweta Redkar
3rd	DS2132	Data Structures Lab	Dr. Shipra Shukla
5th	MA3107	Mathematical Foundations For Data Science-III	Dr. Ashish Kumar
5th	DS3101	Deep Learning	Dr. Neha V Sharma
5th	DS3102	Operating Systems	Mr. Deevesh Chaudhary
5th	DS3103	Natural Language Processing	Dr. Sudhir Sharma
5th	DS3104	Cloud Computing	Dr. Sukhwinder Sharma
5th	DS3130	Deep Learning Lab	Dr. Neha V Sharma
5th	DS3131	Operating Systems Lab	Mr. Deevesh Chaudhary
5th	DS3132	Web Technologies Lab	Mr. Gaurav Kumawat
7th	DS4142	Block chain Technologies	Dr. Sukhwinder Sharma
7th	DS4145	Social Network Analysis	Dr. Sumit Srivastava
7th	DS4150	Computer Vision	Ms. Rashmi Bartwal
7th	DS4147	Information Retrieval	Dr. Neha V Sharma
7th	DS4152	Finance & Accounting	Dr Teena Shivnani
7th	DS4153	Risk Analytics	Dr. Chirag Joshi
7th	DS4154	Financial Market Analytics	Mr. Abhishek Dwivedi
7th	DS4155	Business & Economic Analytics	Dr. Pushp Kumar
7th	DS4156	Fundamentals of Business Analytics	Dr. Chirag Joshi
7th	DS4157	Digital Marketing	Dr. Saroj Ranjan
7th	DS4158	Supply Chain Management	Dr. Aprna Tripathi
7th	DS4170	Industrial Training	Dr. Dinesh Sharma

b. Class Coordinators

B.Tech. (Data Science and Engineering)		
Semester	**Section**	**Class Coordinator**
3rd	A	Dr. Shipra Shukla
3rd	B	Ms. Shweta Anand Redkar
3rd	C	Dr. Sudhir Sharma
5th	A	Dr. Aprna Tripathi
5th	B	Mr. Deevesh Chaudhary
7th	A	Dr. Sukhwinder Sharma
7th	B	Dr. Neha V Sharma

c. Departmental Meeting and BoS Committee

Departmental Meeting and BoS Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Ginika Mahajan	Coordinator

d. PAC/ BoS Committee

Programme Advisory Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Akhilesh Kumar Sharma	Chairman
2	Dr. D.P. Sharma	Member
3	Dr. Sukhwinder Sharma	Member
4	Dr. Aprna Tripathi	Member
5	Dr. Rekha Chaturvedi	Member
6	Dr. Neha V Sharma	Member
7	Dr. Sudhir Sharma	Member
8	Dr. Ginika Mahajan	Member

Board of Studies			
S. No.	**Name**	**Designation/Address**	**Designation/ Role in BoS**
1	Dr. Akhilesh Kumar Sharma	Head, Department of DSE, MUJ	Chairman
2	Dr. Sumit Srivastava	Director, School of IT, MUJ	Member
3	Dr. D.P. Sharma	Professor, Department of DSE, MUJ	Member
4	Dr. Sukhwinder Sharma	Associate Professor, Department of DSE, MUJ	Member

5	Dr. Aprna Tripathi	Assistant Professor, Department of DSE, MUJ	Member
6	Dr. Sudhir Sharma	Assistant Professor, Department of DSE, MUJ	Member
7	Dr. Ginika Mahajan	Assistant Professor, Department of DSE, MUJ	Member
8	Prof. Neeraj Bhargava	Professor, MDS University, Ajmer	External Member
9	Mr. Nishant Srivastava	Solution Architect, Microsoft, Gurugram	External Member
10	Dr. Nitu Bhatnagar	Registrar, MUJ	Ex-officio Member
11	Dr. Jitendra Rajpurohit	Associate Professor, Department of CSE, MUJ	Special Invitee
12	Dr. Himanshu Chaudhary	Associate Professor, Department of Electronics, MUJ	Special Invitee
13	Dr. Pratishtha Mathur	Professor, Department of IT, MUJ	Special Invitee

e. Course File Committee

Course File Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Sudhir Sharma	Coordinator
2	Dr. Rekha Chaturvedi	Member

f. Time-Table Committee

Time-Table Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Aprna Tripathi	Coordinator
2	Dr. Shipra Shukla	Member

g. Examination Committee

Examination Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Aprna Tripathi	Coordinator
2	Dr. Sudhir Sharma	Member

h. Registration Committee

Registration Committee		
S. No.	**Name**	**Designation/Role**
1	Ms. Shweta Redkar	Coordinator
2	All Class Coordinators	Member

i. KPI

Registration Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Neha V Sharma	Coordinator

j. Project/ Industrial Training Committee

Project/ Industrial Training Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Sukhwinder Sharma	Coordinator, Project
2	Dr. Dinesh Sharma	Member
3	Mr. Deevesh Chaudhary	Member

k. Placement/ Internship Committee

Placement/ Internship Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Neha V Sharma	Coordinator

l. Mentor-mentee Committee

Mentor-mentee Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Aprna Tripathi	Coordinator

m. Website/ Digital Media Committee

Website/ Digital Media Committee		
S. No.	**Name**	**Designation/Role**
1	Mr. Deevesh Chaudhary	Coordinator

n. Ph.D./ Research Committee

Ph.D. Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Rekha Chaturvedi	Coordinator
2	Dr. Shipra Shukla	Member

o. OBE Committee

Outcome Based Education (OBE) Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Aprna Tripathi	Coordinator
2	Dr. Neha V Sharma	Member
3	Ms. Shweta Redkar	Member

p. Student Grievance Redressal Committee

Student Grievance Redressal Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Akhilesh Kumar Sharma	Ex-officio Member
2	Dr. Sumit Srivastava	Ex-officio Member
3	Dr. Sukhwinder Sharma	Chairman
4	Dr. Neha V Sharma	Member
5	Dr. Aprna Tripathi	Member
6	Mr. Deevesh Chaudhary	Member
7	Dr. Shipra Shukla	Member
8	Ms. Shweta Redkar	Member
9	Dr. Sudhir Sharma	Member

q. Lab Coordinators

Lab Coordinators		
S. No.	**Name of Lab / Location**	**Coordinator**
1	Programming Laboratory Room No. 003, Ground Floor, Academic Block 2	Mr. Anurag Bhatnagar
2	Embedded Systems Laboratory Room No. 103, First Floor, Academic Block 2	Mr. Venkatesh Gauri Shankar

r. Alumni Committee

Alumni Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Neha V Sharma	Coordinator

s. Student Club/ Chapter Committee

Student Club/ Chapter Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Ginika Mahajan	Coordinator, ANOVA Club
2	Mr. Deevesh Chaudhary	Coordinator, ACM Chapter

t. Research Coordinator

Research Coordinator		
S. No.	**Name**	**Designation/Role**
1	Dr. Rekha Chaturvedi	Coordinator
2	Dr. Shipra Shukla	Member

u. MoU Committee

MoU Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Rekha Chaturvedi	Coordinator, International MoU
2	Mr. Deevesh Chaudhary	Coordinator, Industry MoU

v. Admissions and School Connect Coordinator

Student Club/ Chapter Coordinator		
S. No.	**Name**	**Designation/Role**
1	Dr. Ginika Mahajan	Coordinator, B.Tech.
2	Dr. Shipra Shukla	Coordinator, M.Tech.

w. Academic Handbook and Newsletter Committee

Academic Handbook and Newsletter Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Sukhwinder Sharma	Coordinator, Academic Handbook
2	Mr. Deevesh Chaudhary	Coordinator, Newsletter

x. Departmental Library Committee

Departmental Library, Coursera, NPTEL Committee		
S. No.	**Name**	**Designation/Role**
1	Dr. Sukhwinder Sharma	Coordinator, Departmental Library

8. List of Resources Available

<table>
<tr><th>Name of Laboratory/ Location</th><th>Lab Courses</th><th>Resources Available</th></tr>
<tr><td rowspan="5">Programming Laboratory

Room No. 003, Ground Floor, Academic Block 2</td><td>Data Analytics Lab</td><td rowspan="5">Equipment Available:
HP Probook 400G3-Desktop (30 No.'s):
Intek Core i5 6500 CPU
500 GB 7200 RPM Interface SATA Hard Disk
4 GB DDR3 RAM
HP LV1911 18.5 LED Monitor
HP USB Keyboard
HP USB Optical Mouse

Software Available:
MS Office 2016
Windows 10 Pro 64 Bit
VMWARE
Dev C++, Turbo C
Anaconda + Python
MySQL Pycharm</td></tr>
<tr><td>Object Oriented Programming Lab</td></tr>
<tr><td>Data Structures Lab</td></tr>
<tr><td>Operating Systems Lab</td></tr>
<tr><td>Web Technologies Lab</td></tr>
<tr><td rowspan="8">Embedded Systems Laboratory

Room No. 103, First Floor, Academic Block 2</td><td>Data Analytics Lab</td><td rowspan="8">Equipment Available:
HP Probook 400G3-Desktop (30 No.'s):
Intek Core i5 6500 CPU
500 GB 7200 RPM Interface SATA Hard Disk
4 GB DDR3 RAM
HP LV1911 18.5 LED Monitor
HP USB Keyboard
HP USB Optical Mouse

Software Available:
MS Office 2016
Windows 10 Pro 64 Bit
VMWARE
Dev C++
Anaconda + Python
Cisco Packet Tracer</td></tr>
<tr><td>Object Oriented Programming Lab</td></tr>
<tr><td>Data Structures Lab</td></tr>
<tr><td>Operating Systems Lab</td></tr>
<tr><td>Web Technologies Lab</td></tr>
<tr><td>Advanced Data Structures Lab</td></tr>
<tr><td>Machine Learning Lab</td></tr>
<tr><td>Big Data Analytics Lab</td></tr>
<tr><td>Webpage</td><td colspan="2">https://jaipur.manipal.edu/foe/schools-faculty/schools-list/school-of-information-technology---manipal-university-jaipur/DataScience-Engineering.html</td></tr>
</table>

9. List of MoUs

a. Industrial MoUs

S. No.	Details of MoU	Validity		Nodal Officer
		From	To	
1	Altair Engineering India Pvt Ltd, Bengaluru	01-11-2021	31-10-2023	Dr. Pankaj Vyas
2	Celebal Technologies Private Limited, Jaipur	24-03-2023	23-03-2028	Dr. Akhilesh Kumar Sharma

b. International MoUs

S. No.	Details of MoU	Validity		Nodal Officer
		From	To	
1	King Mongkut's University of Technology North Bangkok, Bangkok, Thailand	04-05-2022	03-05-2023	Dr. Akhilesh Kumar Sharma
2	Prince Sultan University, Riyadh, Saudi Arabia	17-06-2020	16-06-2025	Dr. Akhilesh Kumar Sharma

10. Guidelines for Students

***The policies are subject to revision/changes from time to time as per university norms**

a. Registration Guidelines

Academic Process

Programs of Study

Manipal University Jaipur aims to provide globally accepted education of a high standard. In all programmes of study, great emphasis is placed on the use of modern communication technology to impart quality education to students.

The University follows an efficient and flexible semester system with continuous and comprehensive evaluation. Each semester of study has minimum requirements of number of course credits that must be taken. Each course is defined in terms of contact hours, by lectures, tutorials and/or practical sessions.

Maximum duration of any Academic Programme

The maximum time allowed for a student to complete the degree requirement in any programme is as per the prevalent norms at the time of admission. At present it is 2 years + the actual duration of the programme.

Credits and Promotion

- **Credit Based System:** Each course, theory as well as practical, is expressed in terms of a certain number of credits. The number of contact hours per week determines the credits. Normally, in the case of theory courses, the number of credits is equal to the number of contact hours (lectures & tutorials) per week. For practical courses, one credit is assigned for every two/three contact hours per week.
- Every course is assigned an [L T P C] code indicating Lectures/week, Tutorials /week, Practical/ week and the credits assigned. For example, a theory course with an [L T P C] code of [3 1 0 4] has 3 hours of Lectures/week, 1 hour of Tutorial/week and the credits assigned are 4. A laboratory course with [L T P C] code of [0 0 6 2] has 6 hours of Lab/week and the credits assigned are 2.
- **Semester completion:** A student successfully completes a particular semester when he/she earns the specified credits of that semester and passes (i.e., obtains letter grade E or above) in any Audit course prescribed in the curriculum. A student earns full credits for a registered course if he/she secures letter grade E or higher in that course.
- Promotion to higher semesters is based on securing a prescribed minimum number of credits.
- **Graduation:** A student completes the requirements for graduation, when he/she earns the specified number of credits in all the semesters making up the programme, including Audit courses, if any, prescribed in the curriculum.
- **Course Codes**: The courses offered are coded with 2 letters, indicating the department offering the course, followed by 4 digits. The first digit indicates the level (UG / PG), the second digit indicates the semester and the last two digits indicate the course. The courses are listed for each branch/department separately.

Registration

- Each student has to register for the core courses of his/her programme with the parent department at the commencement of each semester, on the day notified in the Academic calendar.

- The student must also register for the elective courses, if any, (both programme and open electives) that he/she wishes to take in the semester, as notified by the Department.
- **Withdrawal of course registration:** A student who has registered for a course, but desires to withdraw the registration, will be permitted to do so at any time after the registration, but at least seven days before the commencement of the first sessional examination notified in the Academic Calendar.

Promotion to Higher Semesters

- Promotion from an even semester to the next higher odd semester is subject to the minimum academic performance requirements as stated below.
    - To be eligible for promotion to the third semester, a student should have earned a minimum of 30 credits at the end of second semester.
    - To be eligible for promotion to the fifth semester, a student should have earned a minimum of 75 credits at the end of fourth semester.
    - To be eligible for promotion to seventh semester of a four year programme, a student should have earned a minimum of 125 credits at the end of sixth semester.
- Students of 2nd year will be promoted to 3rd year only if they have earned all credits of 1st year. Similarly, students of 3rd year will be promoted to 4th year only if they have earned all credits of 2nd year.
- Credits of core courses in a programme should be earned, but a student may register for different Programme/Open elective courses, if necessary, on re-registration.

Course Re-registration

- **On failure**
    - If a student fails in any course, he/she may re-register for the course in any regular semester, to improve his/her in-semester marks, provided there is no Time-table clash with the regular courses.
    - A student can re-register for a maximum of 8 credits of such failed (backlog) courses, in addition to the credits of the current semester, provided the total does not exceed 32 credits.
    - For such re-registered courses, he/she will be awarded one grade lower than what he earns.
    - The prevailing re-registration course-wise fee (as notified by university) will have to be paid by the student.
    - Students need to attend regular classes in all such cases and have to submit assignments and appear for sessional tests along with the regular students.
    - Re-registration during a regular semester will be allowed only with prior permission of respective HoDs.
- **On passing**
    - If a student, who has a passing grade in any course, desires to improve his grade in that course, he/she may do so by re-registering in that course in the next regular semester, provided the course is running. In such a case he/she will be awarded the grade obtained in the re-registered course.
    - The grade obtained in the re-registered course will be final even if it amounts to Fail or DT grade and will supersede the earlier grade.
    - The normal re-registration fee will be charged in such cases.

Semester Withdrawal

- If a student has been unable to meet the attendance requirements because of prolonged illness in a semester, he/she may opt for semester withdrawal. Approval for withdrawal should be taken at least one month before the start of the semester examinations.
- No fees will be reimbursed in such cases.

Outline of Evaluation

- **Continuous Assessment:** Student performance is continuously assessed in all courses, based on class/tutorial participation, assignment work, lab work, class tests, in semester tests, quizzes and end semester examinations, which contribute to the final grade awarded in the course.
- Performance in each theory course is evaluated out of a maximum of 100 marks, of which 60 marks are for in-semester assignments (evaluation) and 40 marks for the end-semester examinations (ETE). The in- semester assessment in a theory course is based on sessional test (MTE) and assignments, quizzes, case presentations, seminars, etc. (CWS).
- Performance in practical courses is also evaluated out of a maximum of 100 marks and is based totally on in- semester assessment, of which 60 marks are awarded based on class performance (PRS) and 40 marks based on the test/s conducted (PRE). There is no ETE in a practical course.
- The Course plan and evaluation scheme, including the weightage for each component, approved by the HOD, is given to the students by the Course Instructor at the beginning of the semester.
- Performance in the sessional tests and assignments is properly documented and announced within the scheduled period after the tests by the course instructor.
- The overall performance of a student in a course is expressed in terms of a Letter Grade.

Evaluation Procedure

- **Grading:** Marks obtained in the in-semester and end-semester examinations are added together and a 10-point grading system is used to award the student with an overall letter grade for the course.
- **Letter Grading System:** Letter Grades and Grade points are as shown below:
    - Letter Grade A+ A B C D E F/I/DT
    - Grade Point 10 9 8 7 6 5 0
- A student who earns a minimum of 5 grade points (E grade) in a course is declared to have successfully completed the course and earned the credits assigned to it.
- A student should have appeared for the end-semester examination of the prescribed course of study (mere appearance in the continuous assessment tests is not sufficient) to be eligible for the award of a passing grade in the course.
- A total of 35% marks for UG programmes is essential for a student to be awarded a passing grade in any theory course.
- A student who is eligible for, but fails to appear in, the end-semester examination, will be awarded 'F' Grade. However if he/she fails to appear in the end semester examination due to valid reasons, (including medical, non-payment of dues or other family reasons)

he/she will be awarded an 'I' (incomplete) grade. Relaxation to the award of 'I' grade is permissible, only if prior approval has been obtained before the start of the examinations.

- If a student is not eligible to appear in the end-semester examination owing to his/her not fulfilling the minimum attendance requirements in any course, he/she will be awarded a 'DT' grade (detained) and has to re-register for the course(s) at the next available opportunity.

Grade Point Average (GPA) & Cumulative Grade Point Average (CGPA)

- The overall performance of a student will be indicated by two indices: Grade Point Average (GPA) & Cumulative Grade Point Average (CGPA).
- GPA is the weighted average of the grades obtained in a semester.
- CGPA is the weighted average of the grades upto and including any semester. The details of calculation of GPA and CGPA are given in Appendix 1.
- After the results are declared, grade cards will be issued to each student, which will contain the list of courses for that semester and grades obtained by the student, GPA of that semester as well as aggregate attendance percentage of that semester.

End Semester/ Make-up Examination

- The end semester examination will be conducted only in the courses offered in the current semester. That is, at the end of the odd semester, examinations in the courses of the odd semester will be conducted. Similarly, at the end of the even semester, examinations will be conducted only in the courses of the even semester.
- Make-up (supplementary) examinations will be conducted along with regular end-term examination at the end of each semester (provided the course was running in that semester) as also along with the summer semester examination. This facility will be available for students who got F/I grade in the courses offered during the earlier regular semesters.
    - A student can take a Make-up examination in a course in which he is awarded F grade.
    - F grade is awarded if a student fails to secure 35 % marks for UG courses.
    - The grade boundaries in the make-up examination in any course will be the same as those in the immediate preceding regular end-semester examination for that course.
        - For all students who appear in the end summer semester/make-up examinations, the grades awarded will be one lower than what they earn as per point above. However, a student who secures an E grade will retain the same grade he/she has earned.
    - A student who repeats an examination in any course, will be awarded one grade lower than what he/she earns.
    - A student who is awarded ‘I’ grade in a course, and who subsequently takes a make-up examination in that course, will retain the grade he/she has earned.
    - Students may register for make-up examinations in as many courses as they desire, by paying the prescribed fee.
    - Make-up examinations may be given any number of times, as long as a student continues to remain on the University rolls, as a regular/registered student.
- Showing of Answer Books

  - Students will be shown their test/exam answer books on the dates notified in the Academic calendar. Requests to show the answer books would not be entertained beyond this schedule. There will be no re-valuation of the answer books after the results are declared.
- Grade Moderation Committee
  - Grade Moderation Committees (GMC) will be notified by the HoD, for every class in the department and marked to the CoE, before the exams start.
  - Each GMC will have the HoD as Chairperson and all teachers teaching that class as members.
  - The GMC will satisfy itself that all the guidelines for the award of grades have been adhered to and may slightly tweak/modify the grade boundaries calculated in the first instance, by taking into consideration any natural gaps in the marks. However, marks will not be changed.
  - The moderated grades will be forwarded to the COE and a copy of the marks and final grades, along with the statistical parameters used, will be retained by it.
- Declaration of results
  - The Controller of Examinations will declare the results after approval by HOS.
- Withholding of results
  - A student is not allowed to appear in the exam if he/she has not paid all his/her dues. The results of such a student will be withheld if there is a case of disciplinary action pending against him/her.
- Requirements for Award of degree
  - A student completes the requirements for award of degree if he/she fulfills all the conditions given below:
  - Has earned the number of credits specified in the prescribed programmes of study and cleared all Audit courses.
  - Paid all dues to the Institute.
  - No case of disciplinary action is pending against him/her.

Attendance

- Students are expected to attend every lecture, tutorial and practical class scheduled for them. Attendance will be recorded for every class in every course they attend.
- A student with less than 75% attendance in individual courses shall not be permitted to write the end semester examination in that course and will be given DT letter grade in the course. Attendance of lectures, class tests, practicals and tutorials, all count towards the calculation of this percentage.
- A student should meet the above attendance requirement, irrespective of the number of days he/she is on medical and/or other leave for any reason whatsoever. In exceptional circumstances, if a student's attendance falls slightly short of 75% but is above 70% he/she may be given the benefit of having attended any university events or may be given extra assignments, after approval from the HoS.
- Attendance of students is recorded and displayed in the AMS during the semester.
- The names of students who have attendance shortage, will be intimated by the Course Coordinator through HoD, on the last day of teaching to the Academic Section, for display on the Notice Board and onward transmission to the COE.

Change of Branch (Only for BTech students)

- Change of branch is allowed for meritorious BTech 1st year students, against vacancies in the various branches in 2nd year.
- Applications for change of branch shall be invited in April every year and are to be submitted to the Coordinator First Year B.Tech.
- A Merit list will be prepared, based on the students' CGPA after completion of 1st year. Only students who have passed in all the courses of both semesters are eligible for change of branch. Further, the change will be permitted only if the final strength in any branch does not fall below 60% of the actual initial strength.Students who have secured seats under any scholarship scheme and have opted for branch change will not be eligible for the scholarship from the second year.
- Mutual change of branch is not permitted.

Appendix 1

Calculation of GPA and CGPA

Each letter grade is converted into grade points as given in section above. These grade points (Gi) are weighted with the number of credits (Ci) assigned to the course. The Grade Point Average (GPA) is the weighted average of Grade Points awarded to a student in a semester. The weighted average of GPA of all semesters at any point of time is the Cumulative Grade Point Average (CGPA) at that point of time.

GPA and CGPA calculations can be expressed as

$$GPA = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i} \qquad CGPA = \frac{\sum_{j=1}^{N} GPA_j (\sum_{i=1}^{n} C_i)_j}{\sum_{j=1}^{N} (\sum_{i=1}^{n} C_i)_j}$$

where n = Number of courses registered
Ci = Course credits
Gi = Grade point
N = Number of semesters

Example of calculation of GPA and CGPA

Courses	Credits	Letter Grade	Grade Points	$C_i * G_i$
Engg.Mathematics-1	4	A	9	36
Mechanics of Solids	4	A+	10	40
Basic Electronics	4	B	8	32
Mechanical Engg. Science	4	C	7	28
Engineering Physics	4	B	8	32
Comm. Skills in English	3	A	9	27
Basic Workshop Practice	1	A	9	9
Engineering Physics lab	1	B	8	8

Credits =25 GPA = (36+40+32+28+32+27+9+8)/25 = 8.48

Semester	Credits earned	GPA
i	25	8.48
ii	25	8.62
iii	26	8.24
iv	26	8.42

Total credits earned 102

CGPA = 8.48x25 + 8.62x25 + 8.24x26 + 8.42x26 = 860.66/102 = 8.44

b. Class Committee guidelines

A class committee headed by the Dy. Director/ Coordinator (First year) is formed for the first year B.Tech. programme. The section coordinators, course coordinators, and student representatives of all sections will be members of this committee.

For III to VIII Semester of B.Tech. programme, separate class committees are constituted by the Heads of the respective departments. The committee is formed with a senior faculty of the Department as Chairman & Course Coordinators/Course Instructors of all courses & student representatives as members.

Course Coordinator: If there is more than one section, one of the senior faculty members is nominated by the HOD as Course Coordinator.

Functions of the Class Committee:

- The class committee will meet thrice in a semester.
- The first meeting will be held within two weeks from the commencement of the semester in which the course plan, evaluation plan, etc. are discussed.
- The second meeting will be held two weeks after the first sessional to collect feedback and improve the effectiveness of the teaching-learning process. Performance of the students in the tests may also be analyzed.
- The Chairman of the class committee should send the minutes of the class committee meeting to the Director (Academics) through the Head of the Department after each class committee meeting.
- The third meeting is to be held to analyze the performance of the students in all courses of study and grade finalization. However, the student representatives are exempted from this meeting.
- The CoE will declare the results after processing.

Responsibilities of the Class Coordinator:

- Will act as the first point of contact for students.
- Will complete the registration process for students.
- Will keep all details of students related to their academics (like- Marks, Backlogs, Result Analysis, Attendance) and personal (Phone No, Mobile No., E-mail, Parents' contact number, address, local guardian etc.)
- Will send the list of students to the course instructor for which the student has registered.
- Will dispatch regular periodicals to the parents (like Attendance status, mid-term results, important communication, invitations, etc.)
- Maintain the student list who are eligible/not eligible for registering for courses in the next semester. (Should know the academic rules)
- Counsel students during the course reregistration/re-registration process
- Will inform parents after 4-5 days of absence of students.
- Will hold a fortnightly meeting to know the problems of the students.
- Will coordinate with the Examination Charge for all exam activities.
- Will coordinate with the departmental Placement Coordinator and central placement cell of the university.
- Will inform the students about placement opportunities.
- Monitoring the classes.
- Distribution of the student's ID Cards and maintaining their record.
- Identify the achievements of the students and inform Semester Coordinators / HOD, the website in charge.
- Identifying the students for re-sessional (valid medical reasons only: Students list who has missed the sessional)
- Maintain the list of failed students end of the semester and counsel them to register for make-up if he is eligible.
- Maintain the failure list after the Make-up exam
- Any further task responsibility as assigned by the Semester Coordinators / Head of the Department.

c. Mentor-Mentee Scheme

Objective: The mentor-mentee program at Department of Data Science & Engineering aims to provide academic and personal support to second-year students and foster a supportive learning environment throughout their university journey.

Eligibility: All second-year students are eligible to participate in the mentorship program.

Group Allocation: Students will be divided into groups of 30-30 within each section. Each group will be assigned one mentor for a particular semester.

Mentor Allocation: At the beginning of each semester, mentors will be allocated to their respective groups. The allocation process will ensure compatibility, expertise, and relevant experience between mentors and mentees.

Duration: The mentorship program will span across all semesters of the students' academic journey at Manipal University Jaipur, starting from the second year.

Roles and Responsibilities

Mentor Responsibilities

- Provide guidance and support to mentees in academic matters and personal development.
- Facilitate discussions to help mentees set goals and create actionable plans.
- Monitor the progress of mentees and provide constructive feedback.
- Create a positive and inclusive environment for mentees to express concerns and seek assistance.
- Maintain confidentiality regarding all discussions with mentees.

Mentee Responsibilities

- Actively participate in the mentorship program and take initiative to engage with the mentor.
- Set clear goals and communicate them to the mentor.
- Be open to feedback and implement suggestions for improvement.
- Respect the mentor's time and commitment by attending scheduled meetings.
- Seek assistance and guidance as needed and be proactive in addressing challenges.

Communication Channels

Mentors and mentees are encouraged to communicate regularly through various channels such as in-person meetings, email, or virtual platforms.

Evaluation and Feedback

At the end of each semester, mentors and mentees will have an opportunity to provide feedback on the mentorship experience. This feedback will be used to improve the program's effectiveness.

Conflict Resolution

In case of any conflicts or issues between mentors and mentees, a designated program coordinator will mediate and provide assistance in resolving the matter.

Continued Engagement

While mentorship pairs may change each semester, mentors and mentees are encouraged to maintain a professional relationship and continue supporting each other beyond the formal mentorship program.

Recognition

The university will recognize the valuable contributions of mentors through certificates of appreciation and acknowledgment of their role in nurturing student success.

Implementation and Review

The mentor-mentee policy will be implemented at the beginning of each academic year. The program's effectiveness and impact will be periodically reviewed, and necessary improvements will be made to ensure its success.

By implementing this mentor-mentee policy, Manipal University Jaipur aims to enhance students' academic performance, personal growth, and overall university experience.

B.Tech (Data Science & Engineering) Mentor-mentee Coordinators (AY 2023-24)		
Semester	**Section**	**Coordinator**
3rd	A	Dr. Akhilesh Kumar Sharma Dr. D. P. Sharma Dr. Sukhwinder Sharma Dr. Aprna Tripathi
3rd	B	Dr. Aprna Tripathi Dr. Rekha Chaturvedi Dr. Sudhir Sharma Dr. Ginika Mahajan Mr. Gaurav Kumawat
3rd	C	Dr. Akhilesh Kumar Sharma Dr. Chirag Joshi Dr. Dinesh Sharma Dr. Shipra Shukla Dr. Neha V Sharma Mr. Deevesh Chaudhary Mr. Gaurav Kumawat Ms. Shweta Redkar Ms. Shatabdi Basu
5th	A	Dr. Dinesh Sharma Dr. Chirag Joshi Mr. Gaurav Kumawat Ms. Shatabdi Basu
5th	B	Dr. Sukhwinder Sharma Dr. Neha V Sharma Dr. Shipra Shukla Mr. Deevesh Chaudhary Mr. Gaurav Kumawat
7th	A	Dr. Akhilesh Kumar Sharma Dr. Sudhir Sharma Dr. Ginika Mahajan Mr. Deevesh Chaudhary Ms. Shweta Redkar
7th	B	Dr. Aprna Tripathi Dr. Neha V Sharma Dr. Sudhir Sharma Dr. Shipra Shukla Ms. Shweta Redkar

d. Attendance/ Discipline policy

Students are expected to attend every lecture, tutorial and practical class scheduled for them. Attendance will be recorded for every class in every course they attend.

A student with less than 75% attendance in individual courses shall not be permitted to write the end semester examination in that course and will be given DT Letter Grade in the course.

The aggregate percentage of attendance of the student during the semester will be entered in his/her grade sheet for that semester.

e. Examination guidelines (process, punishments for malpractices, etc.) for students and faculty members

Instructions to Students

All students are advised to strictly adhere to the following instructions pertaining to examinations:

- No student will be allowed to enter the examination hall after 10 minutes from the scheduled commencement of the examination under any circumstances. Likewise, no student is allowed to leave the examination hall before half-an-hour (30 Mins.) from the scheduled end of the examination (both for Mid-Term and End Term Examinations).
- Students should read the question paper and the instructions carefully before writing the answers.
- Use of washroom will not be allowed except under the emergent circumstances.
- Students should not bring any books, notes, slips of papers or any written material (except those permitted for the open book mode of examination) to the examination hall, including gadget/ device/ object like electronic watches with memory, logarithmic/ mathematical/ statistical/ scientific tables, programmable calculators, laptop computers, personal stereo systems, walkie-talkie sets, paging devices, mobile phones etc. of unfair assistance.
- Students must check their pockets, surroundings and ensure that no objectionable materials are present.
- After finishing the exam, student should handover the answer booklet/stylus device to the invigilator.
- Students shouldn't look for receiving assistance from other examinees or giving assistance to them (both verbal and non-verbal gestures) in the examination hall on any matter pertaining to the subject of the examination.
- Students shouldn't allow any other student to copy from his/her answer or attempt to copy from the answer of other candidates.
- Students shouldn't be writing any matter on the body parts (like palm, hand, legs, clothes etc.) relevant to the course (s) examination.
- Students shouldn't be using obscene or abusive language in their answer or write any appeal in their answer for more marks or offering inducements/threats to valuers.
- To ensure a smooth login process for E-Pad examinations, and verify the proper functioning of your device, the student must arrive at the examination room 15 minutes early. Please handle the E-pad and stylus with care and make sure to return them in their original working condition to the room invigilators.

Responsibilities of the Invigilators

1. The Invigilator shall collect the blank answer booklets, question paper and attendance sheet along with five Malpractice Forms from the Departmental Exam Coordinator at least 20 minutes prior to the commencement of the Exam.
2. He/ She shall ensure that all the answer booklets are in proper condition and carry the booklet number.
3. He/ She shall ensure that number of answer booklets and question papers are the same as the number of students listed in the attendance sheet.
4. He/She shall ensure that students should enter answer booklet no. in the attendance sheet/invigilator dairy and put his/her signature.
5. He/She should reach the examination hall 15 minutes prior to the commencement of the examination, so as to ensure that students enter the exam room only in his/her presence.
6. He/She must also ensure that no other students, apart from those whose names appear in the attendance sheet, are appearing in the examination.
7. All malpractice cases should be reported to Departmental Exam Coordinator in the prescribed form.
8. After the exam get over, he/she will collect the booklet from each student individually.
9. He/She shall arrange the answer booklets according to the sequence number in attendance sheet.
10. He/She shall deposit the answer booklets and attendance sheet to the Departmental Exam Coordinator.
11. DOs and DON'Ts for invigilators:

DO	DO NOT
Wear your own ID card during invigilation	Allow students after 10 minutes of commencement of Examination.
Check the identity card of student OR permission given in a prescribed format by CoE/Chief Superintendent/ HoD/ Departmental Exam Coordinator before allowing him/her to the exam.	Talk to or help the student directly or indirectly
Read the instructions printed on the answer books to all students prior to commencement of examination for every exam.	Permit other invigilators inside the exam room.
Verify the particulars such as name, registration number, date, month, year, subject of examination, etc. filled by the student on the answer sheet and attendance sheet.	Use mobile phones/electronics gadgets inside the exam room
Carry out vigilant supervision by moving in between the rows as much as possible and check that the student does not possess/use any electronic gadgets.	Keep sitting all the time.
Refer to the Exam Coordinator/HoD/Chief Superintendent, in case of any doubts raised by the student in the question paper	Clarify or guide any doubts raised by the students in the question paper

Collect the answer sheets immediately after the examination from the students	Tell students to leave the answer books on the desk
Report suspected malpractice cases to Exam Coordinator. In case two or more students are involved in helping/talking/passing/copying, register the malpractice case against all of them.	Permit students to leave the examination hall before half-an-hour (30 minutes) from the scheduled end of examination.
For Open Book Examination	
Permit use of books and bound notes only (with name and registration written on it) as per instructions given on Question Papers.	Permit use of loose material

Malpractice/Unfair Means

Level	Type of Malpractice	Mid Term Examination (MTE)	End Term Examination (ETE)	Practical Examination (PRE)
		Punishment		
1	1.1 Possession of mobile phones / smart watch / ear buds / headphones or other electronic gadgets 1.2 In open book examination carrying any material prohibited by the department like solution manual etc. 1.3 Major scribbling on question paper (like solving question or other exam related content) 1.4 Chatting with other students	20% of the maximum marks shall be deducted from the marks obtained by him / her in MTE of this course	20% of the maximum marks shall be deducted from the marks obtained by him / her in ETE of this course	20% of the maximum marks shall be deducted from the marks obtained by him / her in PRE of this course
2	2.1 Found with course related material in mobile phones or on chit or scribbled on parts of body, hall ticket/id card, calculators, etc., but not found using it. 2.2 Refuses to give his/her statement in the malpractice case registration form.	50% of the maximum marks shall be deducted from the marks obtained by him / her in MTE of this course	"0" marks shall be awarded in this course	"0" mark shall be awarded in PRE of this course.
3	3.1 Misbehaving/ Misconduct with Invigilator or any other exam officials. * 3.2 Found copying from course related material in mobile phones or on chit or scribbled on parts of body, hall ticket/id card, calculators, etc., and found using the same. 3.3 Exchange of Answer script/question paper/textbook/notebook etc. with another student 3.4 Taking answer booklet outside examination hall without submitting to the room invigilator * 3.5 Destroying evidence. * 3.6 Carrying of fake identity card (i.e., carrying another student's id card to take own exam) / non-availability of authentic identification card or exam hall ticket except for temporary id card issued by the department or Directorate of Student Welfare. * 3.7 Found copying from fellow students answer sheets during examination. 3.8 After two warnings in any exam (MTE/ETE) in Current semester if student is caught engaged in malpractice in a semester. 3.9 Repeated offence of activities under level 1 in a semester. 3.10 Leaving examination hall without permission. *	"0" mark shall be awarded in MTE of this course exam.	"0" marks shall be awarded in all the courses exam excluding labs	"0" shall be awarded in this course.
4	Repeated offence of any type of malpractice in the same semester (other than level 1)	"0" mark shall be awarded in all the courses of current mid term	"0" marks shall be awarded in all the courses including labs (if lab carries separate credits) of the current semester	
5	Student found taking photo of question paper/ circulating photo of question paper/showing question paper to students standing outside exam hall or found aiding in leaking of question paper	"0" mark shall be awarded in all the theory courses of current mid term	0" marks shall be awarded in all the courses including labs (if lab carries separate credits) of the current semester and shall be debarred from subsequent semester	
6	Impersonation, Severe Misconduct/ Threatening exam officials or fellow students, destroying answer booklet, disrupting examination.	Shall be debarred for one year (current semester and following regular semester)		

*Cases shall be forwarded to the Directorate of Student Welfare for necessary disciplinary action.

Deputed committee may recommend suitable punishments for the case of indulgence in activities listed/not listed in above mentioned guidelines.

f. Guidelines for Value Added Courses

Value Added Courses

The Manipal University envisages that professionally qualified graduates with a sound knowledge of their core disciplines and expertise in a concerned skill will have more openings in service, industry, and self-employment sectors. Making students better prepared to meet demands of the industry/employer as well as develop their own interests and aptitudes is important for higher education institutions by supplementing the curriculum with add on courses. Value added courses help students to develop their own skills in their field of study. These courses ensure the development of soft skills of the individual. Teaching departments of Artificial Intelligence & Machine learning shall offer various VACs apart from the credit bearing courses. These courses may be conducted by involving the experts within or outside the University and help students stand apart from the rest in the job market by adding further value to their graduation.

Objectives of VACs

- To provide students with an opportunity to learn new skills and knowledge beyond their regular curriculum.
- To help students develop their employability skills and make them more competitive in the job market.
- To bridge the skill gaps between the academia and industry.
- To provide students with an opportunity to develop their inter-disciplinary skills.
- To mould students as job providers rather than job seekers.

Course Designing

The teaching departments of the University while designing a VAC shall undertake a need analysis, discuss with the stakeholders, alumni, and experts to identify the gaps and emerging trends. Department also consider the slow learners and advanced learner's students. According to the content and target group, the appropriate pedagogical methods shall be adopted in the curriculum. Any new VAC designed shall be approved by the concerned Department Board of studies (BoS) and Academic Council (AC). The course offered shall not be the same as any course listed in the curriculum of the respective programme/or any other programme offered in the University Departments.

Eligibility for VACs

- All students enrolled in regular programs are eligible to register for VACs.
- Students may be allowed to take VACs offered by other departments after obtaining permission from the Head of the Department offering the course.

Guidelines for conducting value added courses

VAC is not mandatory to qualify any programme. It is a teacher assisted learning course open to all students without any additional fee. In addition to the students of the conducting department, students of other departments can also attend the programme, if slots are available. The selection of students from outside department will be solely based on the discretion of the department.

- The Head of the Department shall appoint a Course Coordinator for the smooth conduct of the VAC with the approval of BoS and Academic Council (AC).
- Classes for a VAC shall be conducted during a time slot beyond the regular class hours, including weekends/vacation period. It can be in hybrid mode (online/offline) also.
- A student shall be permitted to register for only one or two VACS in a Semester.
- The classes of the programmes can be engaged by the faculty of the department, the faculty of other departments of the University or by external experts invited.
- The minimum number of students to be enrolled for a particular course shall be 10 and maximum can be decided by the Course Coordinator depending on the availability of infrastructure.
- A written permission shall be produced by a student from the Head of parent department to attend a VAC conducted by another department.

Duration and mode of teaching of VACs

- The duration of VACs shall be a minimum of 25 hours, including theory and practical/field study.
- The combination of theory and practical classes shall be decided by the course coordinator with the approval of the Head of Department.
- VACs may be conducted during regular class hours, during the reserved time slot in a week, or beyond the regular class hours. Classes can be conducted in hybrid mode also.
- VACs may also be conducted during weekends/vacation periods.

Evaluation of VACs

- VACs shall be evaluated through internal assessments only.
- The internal assessment may include assignments, presentations, projects, or a combination of these.
- The weightage for different components of internal assessment shall be decided by the course coordinator with the approval of the Head of Department.

Awarding Certificate

On successful completion of the VAC, the student shall be issued a certificate duly signed by the Head of the Department and the Course Coordinator.

Additional guidelines

- The course offered should not be the same as any course listed in the curriculum of the respective program/ or any other program offered in University Departments.
- VACs may be offered by in-house faculty or experts from the industry.
- A VAC can be offered only if there are at least 10 students opting for it.
- Students will be permitted to register for only one or two VACs in a semester.

g. Project guidelines, assessment process, SoP for best project

Eighth Semester B.Tech

- Project work should be carried out for a minimum duration of 16 weeks at the institution/ industry/ research laboratory or any other institution where facilities exist, with approval of the parent Department.
- The grade awarded to the student will be based on the total marks obtained by him/ her out of 400 marks.
- There will be a mid-semester evaluation of the work done on the project after 8-10 weeks.
- In case of external projects, the qualitative feedback of the external guide shall be taken.
- The final evaluation and viva-voce will be conducted after the completion of the project work and submission of the project report, by a panel of examiners including the internal guide.

SoP to identify best student project

When selecting the best academic project, it is essential to consider several criteria to ensure a fair and comprehensive evaluation. Here are some common criteria that can be used to assess and choose the best academic project:

S. No.	Head	Description	Max Marks (50)
1.	Originality and Creativity	Evaluate the project's uniqueness, innovative ideas, and creative approaches. Consider whether the project introduces new perspectives, concepts, or solutions to existing problems.	5
2.	Technical Competence:	Assess the project's technical proficiency, including the application of theoretical knowledge, research methodology, data collection and analysis, experimental design, and implementation skills.	5
3.	Problem-solving and Practicality	Evaluate the project's ability to address a specific problem or research question effectively. Consider the project's potential real-world application, feasibility, and practicality of the proposed solutions or outcomes.	5
4.	Research Depth and Rigor	Consider the project's depth of research, including the use of relevant literature, theoretical frameworks, methodologies, and data analysis techniques. Assess the project's rigor in data collection, interpretation, and conclusion drawing.	5

5.	Impact and Significance	Determine the potential impact of the project in its respective field or discipline. Assess whether the project addresses an important issue, contributes to knowledge advancement, or has practical implications for society, industry, or academia.	5
6.	Presentation and Communication	Evaluate the clarity, organization, and effectiveness of the project's presentation. Consider how well the project is communicated through written reports, visual aids, oral presentations, and demonstrations.	5
7.	Collaboration and Teamwork	If the project is a group effort, assess the extent of collaboration and teamwork demonstrated by the project members. Consider how effectively the team worked together, shared responsibilities, and leveraged individual strengths to achieve project goals.	5
8.	Time Management and Project Execution	Evaluate the project's adherence to timelines, milestones, and project management practices. Consider the team's ability to plan, organize, and execute the project within the given timeframe.	5
9.	Ethical Considerations	Assess the project's adherence to ethical standards, such as proper attribution of sources, compliance with research regulations, protection of human subjects (if applicable), and responsible handling of data.	5
10	Overall Quality and Excellence	Consider the overall quality of the project, including the attention to detail, thoroughness, professionalism, and the ability to surpass expectations. Look for projects that demonstrate exceptional performance across multiple criteria.	5

Best Project Selection Process:

The selection process will consist of the following steps:

- **Project Submission**: Students will be required to submit their projects within a specified timeframe, adhering to the guidelines provided. The submission should include project documentation, research findings, and any supplementary materials deemed necessary.

- **Initial Screening:** The selection committee will conduct an initial screening to ensure that all submitted projects meet the minimum requirements and adhere to the guidelines. Projects that do not meet the criteria will be disqualified.

- **Evaluation and Shortlisting:** The committee members will independently evaluate the eligible projects based on the predetermined criteria. Each project will be reviewed thoroughly, and scores will be assigned accordingly. The projects with the highest scores will be shortlisted for the final round.

- **Final Presentation and Selection:** Shortlisted students will be invited to present their projects in front of the selection committee. During the presentation, students will have the opportunity to demonstrate their project's key aspects and answer questions from the committee members. Based on the overall evaluation, the best student project will be selected.

The identification of the best student project will provide recognition and encouragement to talented students, fostering a culture of innovation and excellence. The evaluation process outlined above aims to ensure fairness and transparency. The selected project will be honored and showcased as an exemplar of student achievement, inspiring future generations to strive for academic excellence and contribute to their respective fields.

h. Plagiarism guidelines for Project/ Dissertation/ Research work

MANIPAL UNIVERSITY JAIPUR

POLICY GUIDELINES ON PLAGIARISM

Scope, Prevention, Control and Punitive measures

A. Preamble

Plagiarism is an act of fraud and is widely recognized as a serious problem in academic Institutions all over the world. For this reason, every Institution should have a well-defined policy on not only dealing with plagiarism and any similar acts of academic dishonesty by students or faculty, but also educating them about its ill-effects. Often people are unaware of what constitutes plagiarism and how it can have very adverse effect on the individual and the Institution. Manipal University Jaipur has zero-tolerance for academic dishonesty!

B. Definition

The online dictionary (http://www.dictionary.reference.com) defines plagiarism as *'an act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author'.*

C. Scope

Almost every academic activity is a potential target for plagiarism, including essays, term papers, project reports, theses, dissertations, presentations, research publications, etc. Examples of plagiarism include the following:

1. Buying, stealing or borrowing assignments, experiments or results.
2. Reproducing someone's idea/work, in part or whole, without permission and presenting it as one's own idea/work.
3. Copying a section of a book or article from another's Report or Dissertation, without proper citation.
4. Quoting *word for word* from a source, without giving reference.
5. Self-plagiarism: reproducing or publishing one's own published work, in part or whole, without referring to the earlier published work.

D. Prevention and Control

To avoid unintentional plagiarism, a little vigilance and caution is required. The following checklist can be used as a guide to maintain good practice in academics:

1. Always use your own intellect and resources only, as far as possible.
2. If it is required to use a phrase from another person's work, always follow it up with proper citation of that work.

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3. If the work is likely to generate revenue, it is important that permission is sought from the original author, in order to use any Figure or Table from it, otherwise complete citation should be given below the Figure or Table.
4. Copyright violations should be thoroughly checked and avoided at all times.

E. Obligations of the University

1. Orientation Programme

I. MUJ should undertake to sensitize all its students and faculty members towards academic honesty, by holding regular Workshops about its Plagiarism policy, scope, prevention and punishment.

II. Every staff member, research scholar and senior student of MUJ should be provided a copy of the Plagiarism Policy document.

III. An Orientation programme should be organized for all new entrants, by the University Research Committee (URC) in association with the Academic Section. The Orientation programme should discuss what is plagiarism, how to avoid it, what is the writing style for Reports and research papers, and to explain the University policy on plagiarism.

2. Plagiarism detection

I. With a plagiarism detection software tool like Turnitin, MUJ will organize special training sessions for all concerned, on how to use it and analyze its results.

II. Every thesis/Report submitted to the University should have a Report from the plagiarism detection tool.

III. The DRC (for PhD thesis) or Department Academic Committee (for PG thesis) will examine the Report of the plagiarism detection software tool, to ascertain the level/extent of plagiarism, if any.

IV. All research scholars and PG students will submit a declaration/certificate of original work with their theses. To facilitate this, a Form should be designed and provided to them.

V. All research papers should be analyzed by the detection tool and the Report shared with the guide before the paper is sent for publication to any journal or magazine.

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POLICY GUIDELINES ON PLAGIARISM

Scope, Prevention, Control and Punitive measures

F. Reporting and Handling

1. A complaint or charge of a suspected case of plagiarism **against a student** should be addressed to the Director of the School (for PG students) or the URC (for research scholars). Complaints received from external agencies should be directed to these persons, for time bound action within 30 days. The URC or Department may, on its own, take cognizance of any suspected case
2. In the above situation, a Fact-finding Committee will be set up by the Dean of the Faculty, consisting of the Director of the concerned School, the Head of the Department and one senior faculty member from another Department. The Committee shall examine the details of the case and get a Report of the detection tool, if any. It shall also look at the previously published work of the concerned person, if relevant.
3. The Committee shall submit its Recommendation with the plagiarism detection Report and any other relevant documents. The Recommendation shall be clearly specified in the following categories:
    I. The charge of plagiarism cannot be substantiated. The similarity between documents is within acceptable limits and all relevant citations are present. No further action is required.
    II. Low-level plagiarism: it seems that the plagiarism is the result of negligence and there is no clear intention to copy. The student may be let off with counselling about plagiarism and asked to resubmit the Report within a given time frame.
    III. Mid-level plagiarism: Copying a few portions from online resources, failure to cite a few references, low intent to cheat, which may be due to lack of knowledge. The student should be asked to resubmit the work and a ceiling put on the grade to be awarded.
    IV. High-level plagiarism: deliberate and planned attempt to copy someone else's work, large portions copied from the original, with clear intention to cheat. The student's programme may be terminated.
    V. If the charge of plagiarism is substantiated on a complaint against a student, after he/she has been awarded a degree, the degree may be rescinded.

Note: the level and quantification of plagiarism is left to the judgment of the Committee.

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POLICY GUIDELINES ON PLAGIARISM

Scope, Prevention, Control and Punitive measures

4. A complaint of suspected plagiarism **against a faculty member** should be taken up by a similar 3-member Fact-Finding Committee, set up by the President and consisting of 2 senior faculty members in the concerned specialization and a faculty member from another academic department.
   I. The Recommendations of the Committee should be received within 30 days of its constitution
   II. The Committee should examine all evidences on record and conclusively establish whether the charge of plagiarism is substantiated or not. Its Report should contain all relevant documentary proof.
   III. Based on the findings of the Committee, the competent authority would take suitable action against the person, which could range from salary or rank reduction, to suspension or termination.

G. Appeal

A faculty member or student found guilty of plagiarism and awarded punishment, has the right to appeal against the punishment if he/she so desires.

References

1. www.iitr.ac.in/academics IIT Roorkee plagiarism policy
2. www.plagiarism.org The online resource for dealing with plagiarism
3. www.ox.ac.uk Oxford University: what is plagiarism
4. www.cmu.org/policies Carnegie Mellon University policy on cheating and plagiarism

Registrar MUJ

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11. Awards/ Honours/ Recognition offered by department/ School/ Faculty

Dean's List – Excellence Award

12. OBE framework and assessment scheme (Bloom's Taxonomy, details about internal/ external assessment, implementation of OBE framework, CO/PO attainment process, etc.)

a. OBE Framework

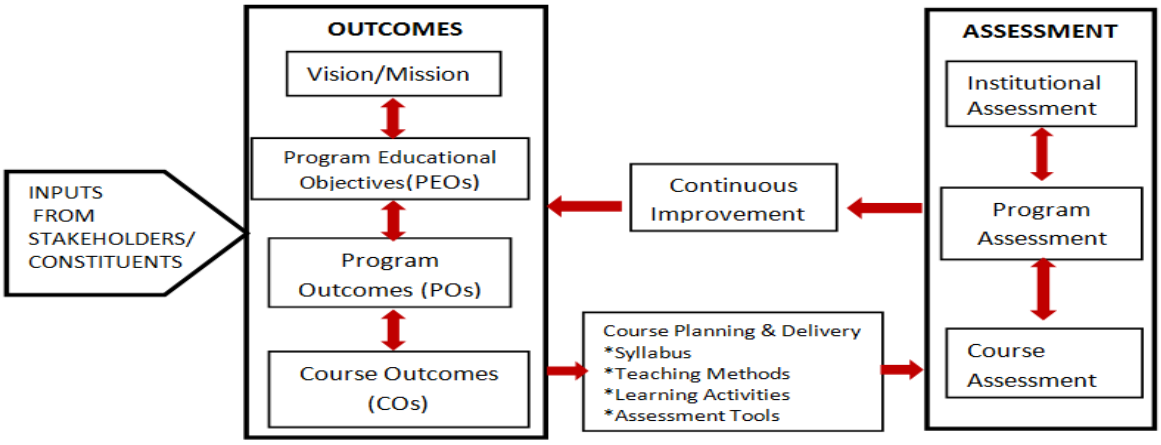

Figure: OBE Framework

b. CO Assessment Process and tools

Evaluation of the Course Outcome

The course outcomes are identified or assigned as per the content and objectives of the course aligned to Program Outcomes and program specific objectives. The course outcomes are planned and designed to cover the entire syllabus and the assigned skills/competencies.

The Course Outcome (CO's) indicators reflect the abilities to be displayed or performed by the students as a result of the knowledge acquired in a course. Based on these indicators the assessment pattern and model are designed for both mid semester and end semester assessments.

Course Outcome is evaluated based on the performance of students in one mid-term exam, continuous internal assessment, and one comprehensive end term examination. The weightage is measured to these constituents' tools is 30%, 30% and 40% for the mid-term exam, internal assessment, and end term exam respectively.

MUJ adopts Continuous Assessment (1 Mid Term Exam and an End Term Exam) supported with summative assessments (Quizzes, Home Assignments, In Class Assignments) for award of its degree and for purpose of measuring outcome attainment.

A detailed information is given in Table below.

Table 1. Assessment Tools

S. No.	Course	Assessment Tools	Frequency
1.	Theory	Mid-Term	Once a semester
		Continuous Assessment (in-class assignments, home assignments and MCQ quizzes)	As per course requirement
		End term Exam	Once a semester
2.	Practical	Continuous Assessment (Experiment, report & viva-voce)	Once every week
		End term exam (Experiment, report, viva-voce)	Once a semester
3.	Internship	End term Evaluation (Presentation, report, viva-voce)	Once in VI semester and VIII Semester

Assessment Tools

Theory course:

Mid-Term Exams: One Mid-Term exam is conducted per semester. The exam is targeted to evaluate student's learning mastery of the subject. The tests is of 90 minutes duration and is evaluated for 30 marks.

End-Term Examination: It is comprehensive summative exam held at the end of each semester. The examination is of three-hour duration and has weightage of 40 marks.

Continuous assessment: Continuous assessment in the form of in-class assignments, home assignments and MCQ quizzes are the qualitative performance assessment tools designed to assess student's knowledge of respective engineering discipline. Continuous assessment has weightage of 30 marks. Submissions are graded based on quality work and originality.

The questions are framed based on the revised Blooms taxonomy. Special care is taken in setting question wherein each question is mapped to an appropriate course outcome of the respective course, which is evaluated based on the set attainment levels.

Practical course:

Lab courses provide students with first-hand experience with course concepts and the opportunity to explore experimental methods used in their respective discipline.

Continuous assessment: All the students are expected to be regular and learn the practical aspects of the subject and develop the necessary skills to become professionals. Like theory courses it is compulsory to maintain 75% attendance in lab otherwise student may be detained and debarred from end term lab examination.

In order to facilitate interaction among the students and to develop team spirit, the students are expected to carry out experiments in groups.

Performance assessment is based on the ability of the student to actively participate in the successful conduct of prescribed practical work and draw appropriate conclusions. The student submits a record of practical work performed in each laboratory session. Continuous assessment constitutes 60 marks of the total lab course marks out of 100.

End lab evaluation: It is comprehensive exam held at the end of each semester. The examination is of three-hour duration. It has weightage of 40 marks. This exam includes performing a given experiment and viva voce.

In order to ensure that defined COs, POs and PSOs are attained, question papers/ assignments are specifically designed in accordance with COs. Every question is mapped with its corresponding CO. The assessments are also designed in such a way that it ensures all COs are measured equally. A threshold value is decided for every course and course outcomes are set to be attained if students obtain marks equal or higher than set threshold value.

Table 2. Marks distribution for CO attainment

CO Attainment	Assessment Tools		
Cumulative Internal Examinations Attainment (CIE)	Theory Course	• Mid Term • Assignment • Quizzes	60%
	Lab Course	• Internal Assessment	60%
	Project	• Internal Assessment	50%
	Seminar	• Internal Assessment	100%
	Industrial Training	• Internal Assessment	100%
Semester End Examinations Attainment (SEE)	Theory Course	• End Term Examination	40%
	Lab Course	• End Term Examination	40%
	Project	• End Term Examination	50%

Table 3. Process followed for assessment.

Criteria	Description	Maximum Marks
Internal Assessment (Summative)	Mid Term Exam	30
	In class Quizzes and Assignments, Activity feedback (Accumulated and Averaged)	30
End Term Exam (Summative)	End Term Exam	40
	Total	100
Attendance (Formative)	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking up the End Semester examination. The allowance of 25% includes all types of leaves including medical leaves.	

Table 4. Assessment Tools and Process for Practical Lab Course

Criteria	Description	Maximum Marks
Internal Assessment (Summative)	Laboratory Sessions	60
End Term Assesment (Summative)	Lab Exam Performance	40
	Total	100
Attendance (Formative)	A minimum of 75% Attendance is required to be maintained by a student to be qualified for taking up the Practical End Semester examination. The allowance of 25% includes all types of leaves including medical leaves.	
Make up Assignments (Formative)	Students who misses a lab session will have to report to the teacher about the absence. The missed experiment can be performed as a makeup experiment in the next lab session or anytime before the laboratory exam	
Laboratory Guidelines	Students are expected to maintain an observation book and a laboratory record notebook. The experimental data should be noted in the observation book on the day of performance and the same should be transferred to the record notebook before the next lab. No students are allowed to enter the lab without the observation book and record book and attendance will be marked absent	

Assessment Method Tools for Calculating Attainment of a Course

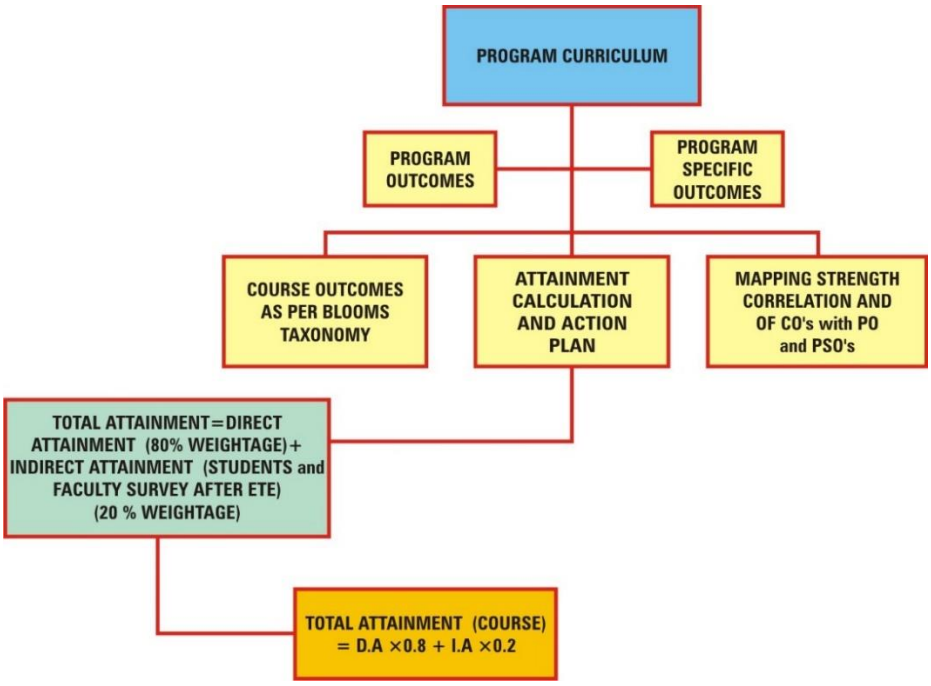

Figure: Flow Chart for Course Attainment

Attainment Levels for End Term Examination (example):

Table 5. Attainment levels for End Term Examination

Attainment Levels		
S.I.NO	Percentage of students scored marks, threshold value and above	Levels
1	0-60	0
2	60-70	1
3	70-80	2
4	80 and above	3

Assessment tools to calculate the attainment of CO's.

Table 6. Weightage distribution to calculate attainment of CO's

Category	Assessment Tool	Weightage
Internal	Mid Term Examinations	20%
	Assignments/Tutorials	15%
	Feedback & Survey	05%
External	University Examination	60%

Calculations

CO Attainment = Internal Assessment (CIE)* 0.6 + Semester End Examination (SEE)* 0.4
CO Attainment (Project) = Internal Assessment (CIE)* 0.5 + Semester End Examination (SEE)* 0.5

PO Assessment Process and tools

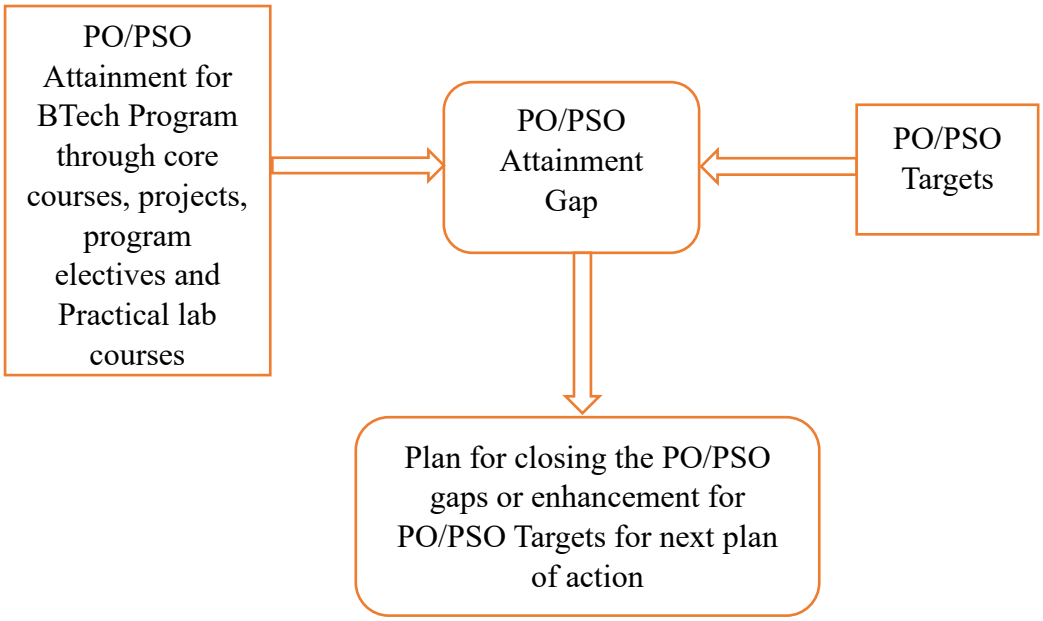

Figure: PO Assessment Process

Assessment Tools

Table 7: PO Attainment tools

Assessment Type	Assessment Tools	Assessment Tools Description
DIRECT TYPE	CO Attained of Core Courses/Program Electives	The CO values of both theory and laboratory courses with appropriate weightage as per CO -PO mapping are taken into account for calculation of direct attainment of PO's and PSO's**.**
	Projects	This assessment tool is explicitly used for courses on Project Work. The tool evaluates the students in relation to their technical, oratory and presentation skills. Appropriate rubrics are used for assessing the attainment of related PO's. This assessment tool plays a vital role in meticulously evaluating student's attainment level of all the program outcomes defined towards the completion of program. Appropriate rubrics are used for assessing attainment of. PO's and PSO's
	Summer Trainings/Internship	The industrial internship offered at the end of the sixth semester is used to measure the PO. Appropriate rubrics are used for assessing the attainment of related PO's and PSO's.
INDIRECT TYPE	Graduate Exit Survey	An exit Survey on 5-point rating scale is conducted by the Program Assessment Committee (PAC) towards the closure of the program to measure the self-assessment of students in terms of attainment of PO's.
	Faculty Survey	

Note: The assessment process includes both the direct and indirect measurement:

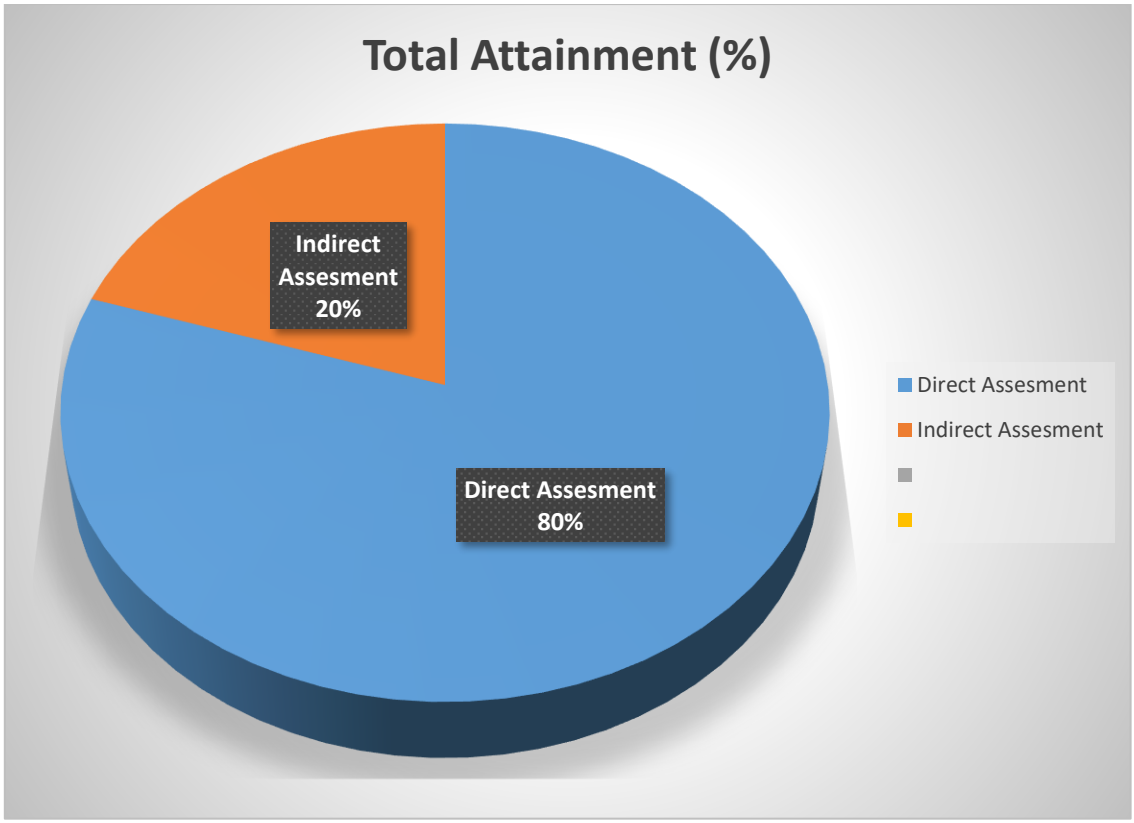

Figure: Total PO Attainment in Percentage

Process of Calculating Program Attainment:

- The attainment of POs is being calculated based on the COs attainment.
- The POs attainment is calculated by multiplying the COs attainment value and the COs contribution factor, where COs contribution factor is 3, 2 and 1 for High, Medium, and low contribution respectively, towards PO's.
- The POs attainment is calculated, and observations are recorded. The PSOs attainment is calculated by the process like that used for POs attainment. If the POs and PSOs attainment value is 1 (low), an essential remedial action has been taken.
- Overall attainment of POs are calculated by taking 80% of direct attainment and 20% of indirect attainment.

13. Policies for students

***The policies are subject to revision/changes from time to time as per university norms**

a. Scholarship policy for U.G/ P.G)

The university offers various scholarships and financial assistance schemes to the engineering students at UG, PG and PhD levels.

Please note the following in the context of all the above scholarships:

- A student cannot hold more than one scholarship concurrently from any source or supporting agency.
- Scholarships will be given only for the actual/minimum duration of the program in which the student is enrolled.
- Grant of scholarships will cease in case any indiscipline case/matter is reported against the student.
- Preference in admissions and award of scholarships is subject to approval of the competent authority. This is applicable to all the relevant scholarships.
- Award of all the scholarships is subject to approval of the competent authority.
- Candidates awarded all the scholarships on basis of arrival of student applications would be communicated at the time of admission and the scholarship amount would be refunded on deposition of course fee (except TMA Pai Engineering Scholarship).
- In case of any dispute, the decision of the President MUJ would be final and binding.
- To continue to get the scholarship, the student should maintain the result every year without any backlogs, failing which the scholarships for that academic year would be withdrawn. In case scholarship of any student withdrawn due to not meeting eligibility criteria, the same would be reinstated in the subsequent years depending upon meeting eligibility criteria in subsequent years. The other terms and conditions of the scholarship would be applicable. This would be applicable to the scholarship awardees of existing batches also.
- To continue to get the scholarship, the student should maintain the result of being the academic topper of that particular batch, failing which the scholarship for the subsequent years will be withdrawn.
- Students have to submit all the required documents at the time of application, No document would be asked individually. The decision would be taken on the basis of submitted documents and no claim would be entertained afterwards.

Following are the details of various scholarships and financial assistance schemes:

TMA Pai Engineering Scholarships

TMA Pai Engineering Scholarship (two scholarships in each branch of Engineering) would be awarded on basis of arrival of student application at the time of online Common Counselling. This scholarship is restricted to top 5000 ranks in Manipal Entrance Test (MET).

Parents' annual income	Parents' annual income
Up to Rs. 5 Lakhs	100%
Above Rs 5.0 Lakhs and up to Rs 7.5	75%
Above Rs 7.5 Lakhs and up to Rs 10.0 Lakhs	50%
Above Rs 10.0 Lakhs and up to Rs 12.5 Lakhs	25%
Above Rs 12.5 Lakhs	10%

- Students applying for these scholarships are required to submit copies of their parents' (both mother and father) ITR / income proof issued by competent Govt. authority (in case of non-filiing of ITR) of the last two financial years. These requisite documents are to be submitted every year.
- ii. To continue to get the scholarship, the student should maintain a CGPA of 8.0 or above, every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Scholarships for Lateral Entry (B Tech)

Scholarships will be offered on basis of arrival of student applications to the students who take admission under Lateral Entry (B Tech) category as per the criteria given below:

- One scholarship in each engineering stream, amounting to 25% of the annual tuition fee, to be granted on the basis of merit, provided the student has aggregate marks 90% or above / CGPA 9.0 or above in qualifying examination.
- ii. To continue to get the scholarship, the student is required to maintain a CGPA of 9.0 or above every academic year, separately, failing which, the scholarship for next academic year would be withdrawn.

TMA Pai Merit Scholarships

- One Scholarship in each stream of engineering and one in each non-engineering program, with 100% waiver on annual tuition fee, will be given to the student with the highest aggregate marks in excess of 90%, in the qualifying exam.
- ii. One Scholarship in each stream of engineering and one in each non-engineering program, with 50% waiver on annual tuition fee, will be given to the student with the highest aggregate marks in excess of 80%, in the qualifying exam.
- iii. One Scholarship in each stream of engineering and one in each non-engineering program, with 25% waiver on annual tuition fee, will be given to students with the highest aggregate marks in excess of 75%, in the qualifying exam.
- iv. To continue to get the scholarships, the students should maintain a CGPA of 8.0 or above every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Rajasthan Merit Scholarships

One Scholarship in each stream of engineering and one in each non-engineering program . (All the Hons programs and pass program of same domain would be considered as a single entity for the purpose of scholarship, ex. B Com (Hons) and B Com would be considered as single entity), will be given to the students from Rajasthan domicile, with the highest aggregate marks in excess of 80% in 10+2 or equivalent qualifying exam. To be eligible, the student should have passed his/her 10th and 10+2 exam from a school in Rajasthan.

*** The student has to submit domicile (issued by the competent government authority) to avail this scholarship.**

- The maximum scholarship given to each student will not exceed the annual tuition fee of the program joined, or Rs. 1 Lakh, whichever is lower.
- ii. To continue to get the scholarship, the student should maintain a CGPA of 7.5 or above every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Financial Assistance for Sibling(s)

20% fee waiver will be offered on annual tuition fee for one sibling enrolled in the university in the I Year in the form of financial assistance. These scholarships will be given to those students whose family income is less than Rs. 5 lakhs per annum.

- Students applying for this assistance are required to submit copies of their parents' (both mother and father) ITR /income proof issued by competent Govt. authority (in case of non-filling of ITR) of the last two financial years. These requisite documents are to be submitted every year.
- ii. To continue to get this assistance, the student should maintain a CGPA of 7.5 or above in every academic year, separately, failing which the assistance for next academic year would be withdrawn.
- iii. Documentary proof of sibling is to be submitted.

Scholarship for "Differently- abled" Students

Scholarships are available for "differently-abled" students whose parents' income is less than Rs.5 lakhs per annum. The amount and quantum of scholarship shall be as follows:

Degree of Handicap	% Fee waiver on annual tuition fee
40- 75%	20
More than 75%	50

- Students applying for these scholarships are required to submit copies of their parents' (both mother and father) ITR / income proof issued by competent Govt. authority (in case of non-filing of ITR) of the last two financial years. These requisite documents are to be submitted every year.
- ii. The student has to submit the certificate of handicap issued by the competent state / national government hospital / board (as per the guidelines issued by Ministry of Social Justice and Empowerment, Government of India). The certificate has to be produced every year during the term of scholarship.
- iii. To continue to get the scholarship, the student should maintain a CGPA of 7.5 or above in every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Scholarships for wards of Martyrs of Defence Personnel / Para Military Forces

Manipal University Jaipur salutes Martyrs of defence personnel / para military forces. 20% fee-waiver is offered to the wards of martyrs of defence and para military personnel.

- The student has to submit the certificate of martyrdom issued by the competent state / national government authority.
- To continue to get the scholarship, the student should maintain a CGPA of 7.5 or above in every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Scholarships for the wards of Single Mother & Orphan Child

Scholarships for the wards of Single Mother One scholarship in each engineering stream and one in each non- engineering program with 20% fee- waiver, will be given to students whose mother's income is less than Rs. 5 lakhs per annum.

- The student has to submit the certificate of single mother issued by the competent state / national government authority.
- Students applying for these scholarships are required to submit copy of their mother's ITR / income proof issued by competent Govt. authority (in case of non-filing of ITR) of the last two financial years. These requisite documents are to be submitted every year.
- All the Hons programs and pass program of same domain would be considered as a single entity for the purpose of scholarship, ex. B Com (Hons) and B Com would be considered as single entity.
- To continue to get the scholarship, the student should maintain a CGPA of 7.5 or above in every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Scholarships for the Orphan student

20% fee- waiver will be given to such students.

- The student has to submit the certificate issued by the state / national authority as per the guidelines of Women Development & Child Welfare department confirming the orphan status and affidavit by the applicant duly notarized given on a bond paper stating that the person is an orphan/destitute.
- ii. To continue to get the scholarship, the student should maintain a CGPA of 7.5 or above in every academic year, separately, failing which the scholarship for next academic year would be withdrawn.

Financial Support for attending Seminars/Conferences

Financial aid will be given to Pre-final and final year students to present R&D work/papers at Seminars/Conferences of repute, as per the conditions mentioned below:

Eligibility	Number & Nature of Event	Aid
Pre Final * / Final Year Students	One International Conference	Up to ₹ 15000/-
	Two National Conferences/ Seminars	Up to ₹ 5000/-

*Any 2 of the above 3 events

Scholarships for Sports Persons

20 seats (50% seats) out of estimated 40 seats to be allocated as fee waiver on first come first serve basis and the remaining 50% seats will be allocated as per merit of the students on approval of the committee.

Eligibility	Aid
If either State Champion or has participated at recognized National/ All India Inter-University (AIU) level sports competitions.	Scholarship of 30% tuition fee
If won Silver/Bronze Medal at recognized National/ All India Inter-University (AIU) level sports competitions.	Scholarship of 60% tuition fee
If won Gold Medal at National /All India Inter- University (AIU) level sports competitions.	Scholarship of 80% tuition fee
If represented the country at recognized International level sports competitions.	Scholarship of 100% tuition fee

Scholarships for students of Higher Semesters

- 20% fee-waiver on annual tuition fee subjective to merit list.
- One scholarship to the topper student of each stream of engineering and non-engineering program in higher semesters will be given.

b. Research policy (PRAISE)

The students are entitled to avail Publication and Research Award Incentive for Students to Excel (PRAISE) benefits as per the following guidelines:

MANIPAL UNIVERSITY
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MUJ/REGR/1403/2018/48 **August 21, 2018**

CIRCULAR

Sub : Guidelines :Publication & Research Award Incentive for Students to Excel (PRAISE)

Ref : Decision taken in the 18th Board of Management Meeting

With reference to the above, the Board of Management of MUJ has approved the guidelines for improving the quality and citation of student's research publications to fulltime & part-time PhD scholars / research fellows / students enrolled for post-graduation program / all undergraduate students of MUJ. This office letter No. MUJ/REGR/1467/2018 dated August 20, 2018 containing the above guidelines is circulated herewith for information of all concerned.

These guidelines will be effective from July 01, 2018. All are requested to comply with the guidelines.

Registrar
Manipal University Jaipur

MANIPAL UNIVERSITY JAIPUR

Encl : Five Sheets

To:

All Deans,
All Directors,
All HoDs,
CoE,
Head HR,
CF&AO & PhD Section.

Copy to:

AR to President – for kind info of President
Pro-President
Registrar Office (Office File)

Manipal University Jaipur, Dehmi Kalan, Near GVK Toll Plaza Jaipur-Ajmer Expressway, Jaipur, Rajasthan 303 007

MANIPAL UNIVERSITY
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Publication and Research Award Incentive for Students to Excel (PRAISE)

Preamble:

Rapid growth in scientific knowledge is an indication of quest for discovery and has an impact on economic and societal development. Science, technology and innovation is often initiated in the University's research environment and it is also the mission of Manipal University Jaipur. Research and development activities create and disseminate new knowledge in diverse fields, promote innovation. These in turn will enhance learning and teaching among students and faculty members of the University. Research is the foundation of knowledge that brings new energy, builds state of the art lab facilities, promotes research publications, develops collaborations and becomes part of active community, focused on achieving the mission objectives. Taking the above into consideration, guidelines on research incentives for faculty/students has been formulated.

1) Objectives:

1.1 To inculcate and promote research perception among the students of Manipal University Jaipur.

1.2 To improve the quality and citations of student research publications.

1.3 To encourage students to publish their research work in reputed journals, which are indexed in Scopus or listed in Journal Citation Report (JCR) by Clarivate Analytics.

2) Applicability:

2.1 The journal publications which are indexed in Scopus or listed in the latest Journal Citation Report (JCR) by Clarivate Analytics, published after July 01, 2018, where the student is an author with MUJ affiliation, shall be considered for PRAISE.

2.2 The student research articles with MUJ affiliation, where the student is author and on rolls of MUJ, and published after July 01, 2018 shall be considered for Publication and Research Award Incentive for Students to Excel (PRAISE).

2.3 Graduated students will be considered for PRAISE provided they publish their research article (s) with MUJ affiliation within one academic year of their programme completion.

3) Eligibility:

Fulltime and Part-time Ph.D. scholars / research fellows / students enrolled for post-graduation program / all undergraduate students of MUJ are eligible for PRAISE.

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Annexure -1

Manipal University Jaipur Policy on Academic Dishonesty and Plagiarism

1. Preamble:

The Manipal University Jaipur is committed to academic excellence and high standards of ethical conduct in research and scientific work. Scientific misconduct relates to data fabrication, falsification, plagiarism, or any other practice that seriously deviates from those commonly accepted within the national and international scientific community, either in performing or reporting research from Manipal University Jaipur. Manipal University Jaipur expects that its faculty, research scholars and students will adhere to the highest national and international standards of good scientific conduct for their work and actions. Academic excellence of the University shall be maintained on implementation of the University Policy on Academic Dishonesty and Plagiarism.

2. Prevention:

It is the author's and co-author's responsibility to prevent any complaint of plagiarism and academic dishonesty while publishing papers/manuscripts, books or making paper presentation in a conference/seminar. The authors are also responsible for any act of plagiarism, cheating, fabrication, academic dishonesty and research misconduct. Matters related to faculty/student plagiarism, authorship issues and actions of research misconduct will be dealt by the departments and institutions. Departmental Research Committee (DRC) will scrutinize authorship, affiliations, acknowledgement, suitability, improvement and other issues.

3. Disciplinary Actions:

The Registrar of Manipal University Jaipur will appoint an enquiry committee, in consultation with the President, MUJ, to investigate and suggest punitive actions whenever an act of plagiarism or academic dishonesty is reported. The Dean of the respective faculty and Head of the respective department will help the enquiry committee to prevent and curb any type of plagiarism and academic dishonesty. Disciplinary action will be taken as per the recommendations of the enquiry committee after approval of the President.

This policy is framed in order to maintain the academic excellence and honesty at Manipal University Jaipur. This policy may be amended from time to time as per the requirements and circumstances.

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4) Responsibility:

4.1 The corresponding author shall take the responsibility to screen the paper for plagiarism, ethics approval [See Annexure I] and background checks about the potential, possible, or probable predatory scholarly open access journals before communicating the research publication. Paper published in discontinued Scopus journals or those not listed in the latest release of JCR at the time of communication shall not be considered for incentives [See Annexure II, III].

4.2 The names of student authors eligible for PRAISE are to be furnished by the supervising faculty/corresponding author.

4.3 Directorate of Research (DoR) shall intimate the departments about the students who are recipients of the award incentives for further processing.

4.4 Students who are recipients of PRAISE shall receive a certificate of appreciation from nominated competent authority at the institutional level on the annual awards day.

4.5 MUJ shall reserve the rights to revise the award incentive guidelines periodically.

5) Incentive for published papers:

5.1 Original research articles, review articles and full length papers published in Scopus or JCR listed journals (by Clarivate Analytics only) qualify for the award incentive as per the slab:

Amount in INR

Sr. No.	Percentile as per Cite Score [Annexure IV]	First Author (Student) (a)	Corresponding Author Faculty (b)	Faculty Co-Author(s)* (c)	Student Co-Author(s) (d)	Maximum Incentives (Per paper)
1	Q4 (Top 75)#	3000	3000	1500	1500	9000
2	Q3 (Top 50-74)##	6000	6000	3000	3000	18000
3	Q2 (Top 25-49)	12000	12000	6000	6000	36000
4	Q1 (Top 10-24)	18000	18000	9000	9000	54000
5	Q1 (Top 2-9)	24000	24000	12000	12000	72000
6	Q1 (Top 1)	36000	36000	18000	18000	108000
8	Category E*	3000	3000	1500	1500	9000

Authors can claim points for a maximum of two papers in an academic year for papers published in Q4 journals.

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##Authors can claim points for a maximum of four papers in an academic year for papers published in Q3 journals.

*Category E is reserved for article (maximum 2 in an academic year) published in UGC approved journals which are not contained in first six categories. The list of Journals (maximum ten journals) of category E should be provided by the Departmental Research Committee (DRC) in the beginning of each calendar year with proper justification, which will be authorized by DoR. Authors can claim award incentives for a maximum of two papers in calendar year for papers published in E category.

** The award incentives/points that a faculty is entitled to, is the same as is mentioned in the FAIR guidelines.

5.2 The maximum award incentive for short communication and case reports is as given below:

Amount in INR

Percentile as per Cite Score	First Author (Student) (a)	Corresponding Author (Faculty) (b)	Faculty Co-Author(s)+	Student Co-Author(s)	Maximum Incentives
Q1 and Q2 (Top 0-49)	4000	4000	2000	2000	12000

+ The incentive/points that a faculty is entitled to, is the same as is mentioned in the Faculty Award Incentive for Research (FAIR) Publication.

5.3 While the first student author and the corresponding author are eligible for the award incentive as stated, the co-authors, both the student as well as faculty shall share the specified incentive equally.

5.4 Short note, letters to the editor, book chapters, short surveys, erratum, replies and conference papers (abstracts, proceedings) etc. **do not** qualify for the award.

6) Plagiarism and related issues:

In the event of any conflict about authorship of complaints related to scientific misconduct, a committee shall be appointed by the DoR under the direction of the university to investigate the matter as per the policy adopted by MUJ.

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7) Custodian of Guidelines / Research Management

The implementation and updating of research guidelines shall be carried out by Directorate of Research, MUJ.

Annexure I: MUJ Policy on Academic Dishonesty and Plagiarism

Annexure II: Link of the Scopus Discontinued List

https://www.elsevier.com/solutions/scopus/content

Annexure III: Link to Journal Citation Report (JCR) by Clarivate Analytics

https://jcr.incites.thomsonreuters.com/JCRJournalHomeAction.action

Annexure IV: Link to Cite Score / Percentile

https://www.scopus.com/sources

File No. : MUJ/REGR/1467/2018

Dated : 21 August 2018

MANIPAL UNIVERSITY JAIPUR

Registrar

Manipal University Jaipur

With Best Wishes!

From:

Department of Data Science & Engineering
School of Information Technology
Faculty of Engineering

Manipal University Jaipur, Jaipur