

**CURRICULUM
AND
SYLLABUS**

FOR

UNDERGRADUATE PROGRAMME

IN

MECHANICAL ENGINEERING

(Operative from 2024 - 25 Session)



**DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING
NATIONAL INSTITUTE OF ADVANCED MANUFACTURING TECHNOLOGY
(Deemed to be University)
HATIA, RANCHI - 834 003**

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

About the department.

The erstwhile Department of Manufacturing Engg. was renamed as Department of Mechanical and Manufacturing Engg. in November 2020 in line with the objective of transforming the NIAMT into an advanced research centre for manufacturing technology. The enablers of such transformation, such as computer-aided design and manufacturing, computer-aided engineering, manufacturing automation, etc., form the core of activities of this department.

Vision.

The department will strive hard to achieve excellence in technical education by offering major and interdisciplinary engineering courses pertaining to mechanical engineering, advanced manufacturing, and automation, and to develop strong competence in these domains.

Mission.

- 1) Development of up-to-date curriculum for undergraduate and postgraduate programmes, incorporating the latest and futuristic academic, research and industrial needs.
- 2) Development of various laboratories with state-of-the-art equipment to enable imparting of quality education.
- 3) Produce high calibre, highly competent, and self-reliant undergraduates, and postgraduates in Mechanical Engineering, who will possess sound scientific knowledge and critical thinking skills and engage in activities relevant to Indian industries with ethical values and flair for research.
- 4) Become a centre of excellence in manufacturing research by conducting innovative research in the areas relevant to advanced manufacturing and by developing technology solutions for Indian manufacturing industries to ensure sustainability and self-reliance.

Courses offered.

The department is offering a 4-years B. Tech. programme in Mechanical Engineering from academic year 2020-21, a 2-years M. Tech. programme in Manufacturing Engineering over the past three decades and PhD programme in Mechanical and Manufacturing Engineering over the past one-and-half decades. The department plans to start a M. Tech. programme in Mechanical Engineering with specializations in Design, Thermal and Manufacturing streams from academic year 2025-26 in place of the ongoing M. Tech. programme in Manufacturing Engineering.

UNDERGRADUATE PROGRAMME IN MECHANICAL ENGINEERING

A) Programme Educational Objectives (PEOs).

PEO-1	Plan, design, construct, maintain and improve mechanical engineering systems that are technically sound, economically feasible and socially acceptable.
PEO-2	Apply analytical, computational, and experimental techniques to address the challenges faced in mechanical and allied engineering streams.
PEO-3	Communicate effectively using conventional platforms as well as innovative / online tools and demonstrate collaboration, networking & entrepreneurial skills.
PEO-4	Exhibit professionalism, ethical attitude, team spirit and pursue lifelong learning to achieve career, organizational and societal goals.

B) Programme Outcomes (POs).

PO-1	Engineering knowledge. Apply the knowledge of mathematics, science, engineering, and technology to the solution of complex mechanical engineering problems.
PO-2	Problem analysis. Identify, formulate, review existing literature, and analyse complex engineering problems to reach substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO-3	Design / development of solutions. Design solutions for mechanical engineering problems and design system components or processes that meet the specified needs with appropriate societal, economical, 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 modelling, to complex mechanical 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 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 practice.
PO-9	Individual and teamwork. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO-10	Communication. Communicate effectively with the engineering community and with society at large, including the ability to comprehend, create effective reports, make effective presentations, and give and receive clear instructions.
PO-11	Project management and finance. Demonstrate the knowledge and understanding of 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.
-------	---

C) Programme Specific Objectives (PSOs).

PSO-1	Apply mechanical and interdisciplinary knowledge to analyse, design and manufacture products to address the needs of the society.
PSO-2	Apply state of the art tools and techniques to conceptualize, design and introduce new products, processes, systems, and services.
PSO-3	Inculcate the motivation to pursue higher studies for contribution to research and development as well as to inspire them to become entrepreneurs.

D) Credit framework under the four-years undergraduate programme with multiple entry and multiple exit options.

The undergraduate programme in Mechanical Engineering allows the students to experience the full range of holistic and multidisciplinary education on Mechanical Engineering with a minor chosen as per their choices and the feasibility of exploring learning in different Institutions. The table shows the credit structure for various levels under the four-years undergraduate programme with multiple entry and exit options.

Level	Qualification Title	Credits	Exit credits*	Semesters
1	One-year UG Certificate in Mechanical Engineering	41	4	2
2	Two-years UG Diploma in Mechanical Engineering	81	4	4
3	Three-years B. Voc. / B. Sc. (Mechanical Engineering)	123	4	6
4	Four-years B. Tech. (Mechanical Engineering)	160	----	8
5	Four-years B. Tech. (Mechanical Engineering) with Multidisciplinary Minor	178 - 180	----	8
6	Four-years B. Tech. Honors (Mechanical Engineering)	180	----	8

* Students exiting the programme after the even semester of an academic year shall obtain these additional minimum credits by completing the prescribed vocational courses (skill-based courses / mini project / internship) to be eligible for the certificate / diploma / degree, as applicable.

- Multiple entries and exits:** The students may enter the undergraduate programme at **Level 1, Level 2, Level 3, and Level 4**, as applicable, in an odd semester and such entries will be governed by the applicable admission guidelines of NIAMT from time to time. Students may exit the undergraduate programme after an even semester after completing the exit credit requirements as applicable. The students exiting after the second semester will get a UG Certificate in Mechanical Engineering (**Level 1**). Those exiting after the fourth and sixth semesters will get a UG Diploma in Mechanical Engineering (**Level 2**) and a B. Voc. / B. Sc. in Mechanical Engineering (**Level 3**) respectively.
- Level 4:** Students will receive the B. Tech. (Mechanical Engineering) degree on successfully completing all eight semesters either at a stretch or with opted exits and re-entries.
- Level 5:** B. Tech. (Mechanical Engineering) with Multidisciplinary Minor enables students to take five additional courses of eighteen-twenty credits in a minor offered by a different department distributed over semesters IV to VIII. Students will select the multidisciplinary minor at the end of second semester.
- Level 6:** B. Tech. Honors (Mechanical Engineering) enables students to take five additional Honors courses of twenty credits in Mechanical Engineering distributed over semesters IV to VIII. Students will exercise the choice of Honors at the end of second semester. A student must have a minimum CGPA of 7.5 after the second semester to be eligible to opt for B. Tech. Honors (Mechanical Engineering). They must get a CGPA of 7.5 or more at the end of eighth semester and must have passed all courses in first attempt to get the Honors degree.

E) Online courses.

UGC Regulations permit up to 40% of the total courses being offered in a semester through online learning courses offered over SWAYAM platform and / or other State Level Common Platforms which may be developed in future with participation of different Universities / HTEIs. Only the courses that have no practical (as per the structure of Undergraduate Programme) will be allowed to be done in online mode. The allowed list of courses will be compiled and approved by the Board of Studies (BoS) of the department from time to time.

F) Course categories and coding conventions.

- | | |
|---|---|
| 1) Basic Sciences / Engineering Sciences | BSC\$## / ESC\$## |
| 2) Humanities, Social Sciences and Management Sciences | HSM\$## |
| 3) Basic Sciences / Engineering Sciences / Humanities, Social Sciences and Management Sciences offered by the Mechanical & Manufacturing Engineering Department (solely or jointly with another Department) | MES\$## |
| 4) Professional Core | MEC\$## |
| 5) Programme Electives / Open Electives | MEE\$## / MEO\$## |
| 6) Project, Seminar, and Internship | MEP\$## |
| 7) Mandatory or Audit Courses | MAA\$## |
| 8) Honours Courses | MEH\$^# |
| 9) Multidisciplinary Minor | MEM1\$# (Minor in Mechanical Engineering)
MEM2\$# (Minor in Manufacturing Engineering) |

The symbol \$ stands for year (1-4) and the symbol ^ stands for semester (1 or 2).

The symbol # stands for one number (1-9) and the symbol ## stands for two numbers (01-99) indicating the course serial numbers.

DISTRIBUTION OF COURSES

1) Basic Sciences (6 Courses, 24 Credits) - (Category Code: BSC)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	BSC101	Engineering Chemistry	-----	3	0	2	4
2	BSC102	Mathematics I (Calculus & Linear Algebra)	-----	3	1	0	4
3	BSC103	Engineering Physics	-----	3	0	2	4
4	BSC104	Mathematics II (Differential Equations & Complex Analysis)	-----	3	1	0	4
5	MES201	Mathematics III (Transforms & Numerical Analysis)	-----	3	1	0	4
6	MES202	Mathematics IV (Probability, Statistics & Quality Control)	-----	3	1	0	4

2) Humanities, Social Sciences and Management Sciences (4 Courses, 12 Credits) - (Category Code: HSM)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	HSM101	English Communication for Professionals	-----	2	0	2	3
2	MES104	Professional Ethics & Universal Human Values	-----	3	0	0	3
3	MES301	Professional Development	-----	2	0	2	3
4	MES401	Innovation & Entrepreneurship	-----	3	0	0	3

3) Engineering Sciences (8 Courses, 27 Credits) - (Category Code: ESC)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	ESC101	Basic Electrical & Electronics Engineering	-----	3	0	2	4
2	MES101	Engineering Mechanics	-----	3	1	0	4
3	MES102	Engineering Graphics & Design	-----	1	0	4	3
4	MES103	Workshop Practice	-----	0	0	2	1
5	MES105	Engineering Materials	-----	3	0	2	4
6	MES106	Machine Drawing Practice	MES102	1	0	4	3
7	ESC201	Applied Electrical & Electronics Engineering	ESC101	3	0	2	4
8	MES203	Programming for Problem Solving using Python	-----	3	0	2	4

4) Professional Core (16 Courses, 61 Credits) - (Category Code: CORE)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEC201	Engineering Thermodynamics	-----	3	1	0	4
2	MEC202	Fluid Mechanics and Hydraulic Machines	-----	3	0	2	4
3	MEC203	Strength of Materials	MES101	3	0	2	4
4	MEC204	Kinematics of Machines	-----	3	1	0	4
5	MEC205	Manufacturing Technology I	-----	3	0	2	4
6	MEC206	Thermal Engineering	MEC201	3	0	2	4
7	MEC301	Dynamics of Machines	MEC204	3	0	2	4
8	MEC302	Design of Machine Elements	-----	3	1	0	4
9	MEC303	Metrology & Measurements	-----	3	0	2	4
10	MEC304	Heat and Mass Transfer	MEC201	3	0	2	4
11	MEC305	Manufacturing Automation	-----	3	0	0	3
12	MEC306	Computer Aided Design	-----	3	0	2	4
13	MEC307	Computer Aided Manufacturing	-----	3	0	2	4
14	MEC308	Manufacturing Technology II	MEC205	3	0	2	4
15	MEC401	Operations Research	-----	3	0	0	3
16	MEC402	Internal Combustion Engines	MEC206	3	0	0	3

5) Programme Electives (4 Courses, 12 Credits) - (Category Code: PELEC)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEE301	Additive Manufacturing	-----	3	0	0	3
2	MEE302	C++ Programming for Mechanical Engineers	-----	2	0	2	3
3	MEE303	Computational Methods in Mechanical Engineering	MES201	3	0	0	3
4	MEE304	Data Analytics and Machine Learning	-----	3	0	0	3
5	MEE305	Design for Manufacturing & Assembly	-----	3	0	0	3
6	MEE306	Fluid Machinery	MEC202	3	0	0	3
7	MEE307	Industrial Robotics	-----	3	0	0	3
8	MEE308	Sensors and Applications	ESC202	3	0	0	3
9	MEE401	Automobile Engineering	-----	3	0	0	3
10	MEE402	Bio Fluid Mechanics	-----	3	0	0	3

11	MEE403	Biomechanics	----	3	0	0	3
12	MEE404	Composite Materials and Structures	----	3	0	0	3
13	MEE405	Computer Aided Inspection	MEC303	3	0	0	3
14	MEE406	Computer Integrated Manufacturing	MEC306 / MEC307	3	0	0	3
15	MEE407	Cryogenics	----	3	0	0	3
16	MEE408	Fluid Power Control	----	3	0	0	3
17	MEE409	Fracture Mechanics	----	3	0	0	3
18	MEE410	Gas Dynamics & Jet Propulsion	MEC206	3	0	0	3
19	MEE411	Heat Treatment Technology	MES104	3	0	0	3
20	MEE412	Hybrid Machining Processes	MEC308	3	0	0	3
21	MEE413	Machine Tools Design	----	3	0	0	3
22	MEE414	Material Characterization Techniques	----	3	0	0	3
23	MEE415	Material Handling Systems & Equipment	----	3	0	0	3
24	MEE416	Mechanical Behaviour & Testing of Materials	----	3	0	0	3
25	MEE417	Mechatronics and Industrial Automation	ESC202	3	0	0	3
26	MEE418	Metal Forming Technology	MEC205	3	0	0	3
27	MEE419	Micro and Nano Manufacturing	----	3	0	0	3
28	MEE420	Non-destructive Evaluation	----	3	0	0	3
29	MEE421	Non-traditional Machining Processes	----	3	0	0	3
30	MEE422	Optimization Techniques for Engineering Design	----	3	0	0	3
31	MEE423	Power Plant Engineering	----	3	0	0	3
32	MEE424	Production Planning and Control	----	3	0	0	3
33	MEE425	Programmable Logical Controllers	ESC202	3	0	0	3
34	MEE426	Refrigeration & Air-conditioning	MEC206	3	0	0	3
35	MEE427	Reverse Engineering	MEC306	3	0	0	3
36	MEE428	Supply Chain Management	----	3	0	0	3
37	MEE429	Surface Engineering	----	3	0	0	3
38	MEE430	Sustainable Manufacturing	-----	3	0	0	3

6) Open Electives (3 Courses, 9 Credits) - (Category Code: OELEC)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEO301	Artificial Intelligence in Manufacturing	MES203	3	0	0	3
2	MEO302	Industrial Engineering & Management	----	3	0	0	3
3	MEO303	Maintenance Engineering & Management	----	3	0	0	3
4	MEO401	3D Printing and Design	----	3	0	0	3
5	MEO402	Financial & Accounting Management	----	3	0	0	3
6	MEO403	Industry 4.0	MEE308	3	0	0	3
7	MEO404	Product Design and Ergonomics	----	3	0	0	3
8	MEO405	Renewable Energy Engineering	----	3	0	0	3
9	MEO406	Soft Computing Techniques	MEE302	3	0	0	3
10	MEO407	Virtual Reality (VR)	MEE302	3	0	0	3

7) Mandatory and Audit Courses (6 Courses, 0 Credits) - (Category Code: MAA)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MAA101	Induction Programme	----	3 Weeks			0
2	MAA102	Sports and Yoga / NCC / NSS	----	0	0	0	0
3	MAA103	Indian Knowledge System	----	2	0	0	0
4	MAA104	Sports and Yoga / NCC / NSS	----	0	0	0	0
5	MAA201	Environmental Science	----	2	0	0	0
6	MAA202	Constitution of India	----	2	0	0	0

8) Project, Seminar, and Internship (4 Courses, 15 Credits) - (Category Code: PPS)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEP301	Summer Internship	----	4 Weeks (min.)			2
2	MEP401	Summer Internship	----	4 Weeks (min.)			2
3	MEP402	Seminar	----	0	0	4	2
4	MEP403	Mechanical Engineering Project	----	0	0	18	9

Notes

- 1) Seminar - 2 Credits - Students will study a recent research paper under the supervision of a faculty member of this department and present the same in the form of a seminar. The seminar topic must be from an area of Mechanical Engineering different from their project topic.

- 2) Summer Internship (industrial or academic) - 2 Credits each - Students will undergo training / internship for a minimum period of 4 weeks during the summer vacation of the second year and third year. Attachment with IISc / IITs / NITs or technical universities in India and abroad is also allowed in lieu of industrial training. Evaluation will be conducted during the seventh semester. The evaluation will be based on technical report and presentation.
- 3) Mechanical Engineering Project - 9 Credits - The project work will be done in an area of Mechanical Engineering. Interdisciplinary work where Mechanical Engineering is primary can also be done. The project is mandatory for Level 6, while the students of Levels 4 to 5 may opt for one of the following in lieu of the project.
 - a) Three or more courses related to Mechanical Engineering and have not been studied by the student (as per the course structure in this document) from SWAYAM or similar channels leading to 9 (nine) credits.
 - b) One full semester internship in a Mechanical Engineering related industry (academic internships are not allowed) during the VIII semester. The internship should be project-based. Upon completion of internship, student will submit a report duly endorsed by a competent authority from the industry where the internship was done.

9) Honors Courses (5 Courses, 20 Credits) - (Category Code: HONS)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEH221	Advanced Engineering Materials	MES104	3	1	0	4
2	MEH222	Advanced Fluid Mechanics	MEC202	3	1	0	4
3	MEH223	Advanced Welding Technology	MEC205	3	1	0	4
4	MEH311	Fuels Combustion and Emission Control	MEC206	3	1	0	4
5	MEH312	Analysis of Thermal Power Cycles	MEC206	3	1	0	4
6	MEH313	Computational Fluid Dynamics	MEC202	3	0	2	4
7	MEH321	Advanced Heat Transfer	MEC304	3	1	0	4
8	MEH322	Design and Analysis of Turbo Machines	MEC206	3	1	0	4
9	MEH323	Mechanical Vibrations & Analysis	MEC301	3	1	0	4
10	MEH411	Finite Element Methods in Mechanical Engineering	MES201 / MEC304	3	0	2	4
11	MEH412	Advanced Metal Forming Technology	MEC205	3	1	0	4
12	MEH413	Design of Heat Transfer Equipment	MEC304	3	1	0	4
13	MEH421	Advanced CAD / CAM	MEC306 / MEC307	3	0	2	4
14	MEH422	Dies, Moulds & Tools Engineering	MEC308	3	0	2	4
15	MEH423	Digital Manufacturing	MEC306 / MEC307	3	1	0	4

10) Multidisciplinary Minor in Mechanical Engineering (5 Courses, 20 Credits) - (Category Code: MDM)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEM121	Engineering Mechanics (MEC101)	-----	3	1	0	4
2	MEM122	Engineering Thermodynamics (MEC201)	-----	3	1	0	4
3	MEM123	Fluid Mechanics and Hydraulic Machines (MEC202)	-----	3	0	2	4
4	MEM124	Kinematics of Machines (MEC204)	-----	3	0	2	4
5	MEM132	Manufacturing Technology	-----	3	0	2	4
6	MEM133	Thermal Engineering (MEC206)	MEC201	3	0	2	4
7	MEM141	Dynamics of Machines (MEC301)	MEC204	3	0	2	4
8	MEM142	Design of Machine Elements (MEC206)	-----	3	1	0	4
9	MEM143	Heat and Mass Transfer (MEC304)	MEC201	3	1	0	4

11) Multidisciplinary Minor in Manufacturing Engineering (5 Courses, 20 Credits) - (Category Code: MDM)

S#	Code	Name of subject	Pre-requisites	L	T	P	Credits
1	MEM221	Engineering Mechanics (MES101)	-----	3	1	0	4
2	MEM222	Engineering Materials (MECS04)	-----	3	0	2	4
3	MEM231	Manufacturing Technology I (MEC205)	-----	3	0	2	4
4	MEM232	Computer Aided Design and Manufacture	-----	3	0	2	4
5	MEM241	Engineering Metrology	-----	3	0	2	4
6	MEM242	Dies, Moulds & Tools Engineering (MEH422)	MEM243	3	0	2	4
7	MEM243	Manufacturing Technology II (MEC307)	MEM231	3	0	2	4
8	MEM244	Precision Manufacturing	-----	3	1	0	4

COURSE STRUCTURE

Semester 1

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	BSC101	Engineering Chemistry	BSC	-----	3	0	2	4
2	BSC102	Mathematics I (Calculus & Linear Algebra)	BSC	-----	3	1	0	4
3	ESC101	Basic Electrical and Electronics Engineering	ESC	-----	3	0	2	4
4	MES101	Engineering Mechanics	ESC	-----	3	1	0	4
5	MES102	Engineering Graphics & Design	ESC	-----	1	0	4	3
6	MES103	Workshop Practice	ESC	-----	0	0	2	1
7	MAA101	Induction Programme	MAA	-----	3 Weeks			0
8	MAA102	Sports and Yoga / NCC / NSS	MAA	-----	0	0	2	0
Total Credits							20	

Semester 2

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	BSC103	Engineering Physics	BSC	-----	3	0	2	4
2	BSC104	Mathematics II (Differential Equations & Complex Analysis)	BSC	-----	3	1	0	4
3	HSM101	English Communication for Professionals	HSM	-----	2	0	2	3
4	MES104	Professional Ethics & Universal Human Values	HSM	-----	3	0	0	3
5	MES105	Engineering Materials	ESC	-----	3	0	2	4
6	MES106	Machine Drawing Practice	ESC	MES102	1	0	4	3
7	MAA103	Indian Knowledge System	MAA	-----	2	0	0	0
8	MAA104	Sports and Yoga / NCC / NSS	MAA	-----	0	0	2	0
Total Credits							21	

Semester 3

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MES201	Mathematics III (Transforms & Numerical Analysis)	BSC	-----	3	1	0	4
2	MEC201	Engineering Thermodynamics	CORE	-----	3	1	0	4
3	MEC202	Fluid Mechanics and Hydraulic Machines	CORE	-----	3	0	2	4
4	MEC203	Strength of Materials	CORE	MES101	3	0	2	4
5	MEC204	Kinematics of Machines	CORE	-----	3	1	0	4
6	MAA201	Environmental Science	MAA	-----	2	0	0	0
Total Credits							20	

Semester 4

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MES202	Mathematics IV (Probability, Statistics & Quality Control)	BSC	-----	3	1	0	4
2	MES203	Programming for Problem Solving using Python	ESC	-----	3	0	2	4
3	ESC201	Applied Electrical and Electronics Engineering	ESC	ESC101	3	0	2	4
4	MEC205	Manufacturing Technology I	CORE	-----	3	0	2	4
5	MEC206	Thermal Engineering	CORE	MEC201	3	0	2	4
6	MAA202	Constitution of India	MAA	-----	2	0	0	0
7	-----	Multidisciplinary Minor I*	MDM		3	0	2	4
8	MEH22X	Honours Course I**	HONS		3	0	2	4
Total Credits							20 / 24* / 24**	

Semester 5

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MEC301	Dynamics of Machines	CORE	MEC204	3	0	2	4
2	MEC302	Design of Machine Elements	CORE	-----	3	1	0	4
3	MEC303	Metrology & Measurements	CORE	-----	3	0	2	4
4	MEC304	Heat and Mass Transfer	CORE	MEC201	3	0	2	4
5	MEC305	Manufacturing Automation	CORE	-----	3	0	0	3
6	-----	Multidisciplinary Minor II*	MDM	-----	3	0	2	4
7	MEH31X	Honours Course II**	HONS	-----	3	0	2	4
8	MEP301	Summer Internship	PPS	-----	4 Weeks (Min.)			2
Total Credits							21 / 25* / 25**	

Semester 6

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MEC306	Computer Aided Design	CORE	-----	3	0	2	4
2	MEC307	Computer Aided Manufacturing	CORE	-----	3	0	2	4
3	MEC308	Manufacturing Technology II	CORE	MEC205	3	0	2	4
4	MES301	Professional Development	HSM	-----	2	0	2	3
5	MEE3XX	Professional Elective I	PELEC	-----	3	0	0	3
6	MEO3XX	Open Elective I	OELEC	-----	3	0	0	3
7	-----	Multidisciplinary Minor III*	MDM	-----	3	0	2	4
8	MEH32X	Honours Course III**	HONS	-----	3	0	2	4
Total Credits							21 / 25* / 25**	

Semester 7

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MES401	Innovation & Entrepreneurship	HSM	-----	3	0	0	3
2	MEC401	Operations Research	CORE	-----	3	0	0	3
3	MEC402	Internal Combustion Engines	CORE	MEC206	3	0	0	3
4	MEE4XX	Professional Elective II	PELEC	-----	3	0	0	3
5	MEE4XX	Professional Elective III	PELEC	-----	3	0	0	3
6	MEO4XX	Open Elective II	OELEC	-----	3	0	0	3
7	-----	Multidisciplinary Minor IV*	MDM	-----	3	0	2	4
8	MEH41X	Honours Course IV**	HONS	-----	3	0	2	4
9	MEP401	Summer Internship	PPS	-----	4 Weeks (Min.)			2
Total Credits							20 / 24* / 24**	

Semester 8

S#	Code	Name of subject	Category	Pre-requisites	L	T	P	C
1	MEE4XX	Professional Elective IV	PELEC	-----	3	0	0	3
2	MEO4XX	Open Elective III	OELEC	-----	3	0	0	3
3	-----	Multidisciplinary Minor V*	MDM	-----	3	0	2	4
4	MEH42X	Honours Course V**	HONS	-----	3	0	2	4
5	MEP402	Seminar	PPS	-----	0	0	4	2
6	MEP403	Mechanical Engineering Project	PPS	-----	0	0	18	9
Total Credits							17 / 21* / 21**	

* These subjects / credits are applicable to Level 5 only.

** These subjects / credits are applicable to Level 6 only.