National Institute of Technology Patna
Department of Mechanical Engineering

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Course Structure for B. Tech (Mechanical Engineering) Program

Third Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME3801	Material Science & Engineering	3	0	0	3	ME
2	ME3802	Thermodynamics	3	0	0	3	ME
3	ME3803	Manufacturing Process	3	0	0	3	ME
4	ME3804	Kinematics of Machinery	3	0	0	3	ME
5	CE3801	Environmental Engineering	3	0	0	3	CE
6	MA3801	Numerical Methods for Engineers	3	0	0	3	Math
7	ME0000	MOOC/Swayam course	3	0	0	3	NPTEL/ Swayam
8	MEL3801	Manufacturing Process Lab	0	0	3	1	ME
9	EAA3801	Extra Academic Activity (Sports / Innovative Project)	0	0	3	1	SAC/IC
	Total	-	18	0	6	20	-

MOOC/ Swayam Course: Two courses are compulsory for award of B.Tech Degree. However students can opt two more courses (optional) according to their preferences. Students can opt MOOC/Swayam courses (at any semester starting) from 3rd semester onwards

Fourth Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME4801	Applied Thermodynamics	3	0	0	3	ME
2	ME4802	Fluid Mechanics & Machinery	3	0	0	3	ME
3	ME4803	Industrial Engineering and Management	3	0	0	3	ME
4	ME480x	Professional Elective-I	3	0	0	3	ME
5	ME480x	Professional Elective-II	3	0	0	3	ME
6	OE0xy1	Open Elective-I	3	0	0	3	-
7	ME0000	MOOC/Swayam course	3	0	0	3	NPTEL/ Swayam
8	MEL4801	Applied Thermodynamics Lab	0	0	3	1	ME
9	MEL4802	Fluid Mechanics & Machinery Lab	0	0	3	1	ME
	Total	-	18	0	6	20	-

Professional Elective – I (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME4804	Advanced Strength of Materials	3	0	0	3	ME
2	ME4805	Statistical Quality Control	3	0	0	3	ME

Professional Elective – II (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME4806	Mechatronics and Robotics	3	0	0	3	ME
2	ME4807	Renewable Energy Systems	3	0	0	3	ME

MOOC/ Swayam Course: Two courses are compulsory for award of B.Tech Degree. However students can opt two more courses (optional) according to their preferences. Students can opt MOOC/Swayam courses (at any semester starting) from 3rd semester onwards

Fifth Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME5801	Heat Transfer	3	0	0	3	ME
2	ME5802	Machine Design-I	3	0	0	3	ME
3	ME5803	Dynamics of Machinery	3	0	0	3	ME
4	ME580x	Professional Elective-III	3	0	0	3	ME
5	ME580x	Professional Elective-IV	3	0	0	3	ME
6	OE0xy2	Open Elective-II	3	0	0	3	-
7	ME0000	MOOC/Swayam course	3	0	0	3	NPTEL/ Swayam
8	MEL5801	Heat Transfer Lab	0	0	3	1	ME
9	MEL5803	Dynamics of Machinery Lab	0	0	3	1	ME
	Total	-	18	0	6	20	-

Professional Elective – III (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME5804	Measurements & Instrumentation	3	0	0	3	ME
2	ME5805	Power Plant Engineering	3	0	0	3	ME

Professional Elective – IV (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME5806	Operations Research	3	0	0	3	ME
2	ME5807	Metal Forming Processes	3	0	0	3	ME

MOOC/ Swayam Course: Two courses are compulsory for award of B.Tech Degree. However, students can opt two more courses (optional) according to their preferences. Students can opt MOOC/Swayam courses (at any semester starting) from 3rd semester onwards

Sixth Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME6801	Internal Combustion Engine	3	0	0	3	ME
2	ME6802	Machine Design-II	3	0	0	3	ME
3	ME6803	Machine Tools & Machining	3	0	0	3	ME
4	ME680x	Professional Elective-V	3	0	0	3	ME
5	ME680x	Professional Elective-VI	3	0	0	3	ME
6	OE0xy3	Open Elective-III	3	0	0	3	-
7	ME0000	MOOC/Swayam course	3	0	0	3	NPTEL/ Swayam
8	MEL6801	Internal Combustion Engine Lab	0	0	3	1	ME
9	MEL6803	Machine Tools & Machining Lab	0	0	3	1	ME
	Total	-	18	0	6	20	-

Professional Elective – V (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME6804	Computational Fluid Dynamics	3	0	0	3	ME
2	ME6805	Advanced Materials & Tools	3	0	0	3	ME
3	ME6806	Introduction to Engineering Optimization	3	0	0	3	ME

Professional Elective – VI (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME6807	Finite Element Methods	3	0	0	3	ME
2	ME6808	CAD/CAM	3	0	0	3	ME
3	ME6809	Mechanical Vibration	3	0	0	3	ME

MOOC/ Swayam Course: Two courses are compulsory for award of B.Tech Degree. However students can opt two more courses (optional) according to their preferences. Students can opt MOOC/Swayam courses (at any semester starting) from 3rd semester onwards

Seventh Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME7801	Refrigeration and Air-Conditioning	3	0	0	3	ME
2	ME780x	Professional Elective-VII	3	0	0	3	ME
3	ME780x	Professional Elective-VIII	3	0	0	3	ME
4	OE0xy4	Open Elective-IV	3	0	0	3	ME
5	ME0000	MOOC/Swayam course	3	0	0	3	NPTEL/ Swayam
6	MEL7801	Minor Project	0	0	15	5	ME
7	MEL7802	Industrial Training	-	-	-	2	ME
8	MEL7803	Refrigeration and Air-Conditioning Lab	0	0	3	1	ME
9	MEL7804	Seminar & Technical Writing	0	0	6	2	ME
	Total	-	12	0	24	**22**	-

Professional Elective – VII (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME7802	Automobile Engineering	3	0	0	3	ME
2	ME7803	Nonlinear Vibrations	3	0	0	3	ME
3	ME7804	Gas Turbine & Jet Propulsion	3	0	0	3	ME
4	ME7805	Material Handling	3	0	0	3	ME

Professional Elective – VIII (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME7806	Non-Conventional Manufacturing	3	0	0	3	ME
2	ME7807	Total Productive Maintenance	3	0	0	3	ME
3	ME7808	Tribology	3	0	0	3	ME
4	ME7809	Advances in Fabrication Processes	3	0	0	3	ME

- **MOOC/ Swayam Course:** Two courses are compulsory for award of B.Tech Degree. However students can opt two more courses (optional) according to their preferences. Students can opt MOOC/Swayam courses (at any semester starting) from 3rd semester onwards.

Eighth Semester

Sl. No.	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME880x	Professional Elective-IX	3	0	0	3	ME
2	ME880x	Professional Elective-X	3	0	0	3	ME
3	MEL8801	Major Project	0	0	30	10	ME
4	MEL8802	Seminar & Technical Writing	0	0	6	2	ME
5	MEL8803	Comprehensive Viva-Voce	-	-	-	2	ME
	Total	-	6	0	36	**20**	-

Professional Elective – IX (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME8801	Product Design & Development	3	0	0	3	ME
2	ME8802	Heat Exchanger Design	3	0	0	3	ME
3	ME8803	Additive Manufacturing & 3D printing	3	0	0	3	ME
4	ME8804	Ergonomics	3	0	0	3	ME

Professional Elective – X (List)

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	ME8805	Machine Condition Monitoring	3	0	0	3	ME
2	ME8806	Production and Operations Management	3	0	0	3	ME
3	ME8807	Aerodynamics	3	0	0	3	ME
4	ME8808	Total Quality Management	3	0	0	3	ME

List of open electives (for other departments):

Sl. No	Course Code	Course Title	L	T	P	Credits	Dept.
1	OE0801	Elements of Mechanical Engineering	3	0	0	3	ME
2	OE0802	Renewable Energy	3	0	0	3	ME
3	OE0803	Introduction to Operations Research	3	0	0	3	ME
4	OE0804	Introduction to Power Plants	3	0	0	3	ME

Summary of Type of Courses and Credit Distribution as per institute guidelines

SL.No.	Type of Courses	No./Range of Courses	Credit Limits	Sem1	Sem2	Sem3	Sem4	Sem5	Sem6	Sem7	Sem8	Total No. of Courses	Credit Count
		Guideline											
1	FC	10	30	5	4	2	-	-	-	-	-	**11**	**33**
2	PCC	15-17	45-51	-	2	4	3	3	3	1	-	**16**	**47**
3	PEL	10	30	-	-	-	2	2	2	2	2	**10**	**30**
4	OEL	4	12	-	-	-	1	1	1	1	-	**4**	**12**
5	MOOC	2-4	6-12	×	×	√	√	√	√	√	√	**2(min) 4(max)**	**6(min) 12(max)**
6	FLAB	10	10	3	1	-	-	-	-	-	-	**4**	**4**
7	PLAB	10	10	1	2	1	2	2	2	1	-	**11**	**11**
8	EAA	1+1+2	3	1	1	1	-	-	-	-	-	**3**	**3**
9	SIRE	1	2	-	-	-	-	-	-	1	-	**1**	**2**
10	STW	2	4	-	-	-	-	-	-	1	1	**2**	**4**
11	Project	2	5+10	-	-	-	-	-	-	1	1	**2**	**15**
12	CVV	1	2	-	-	-	-	-	-	-	1	**1**	**2**
13	**Total No. of Courses**	**69-73**	---	**10**	**10**	**8**	**8**	**8**	**8**	**8**	**5**	**65-67**	---
14	**Total Credit**	**169-181**		**20**	**21**	**20**	**20**	**20**	**20**	**22**	**20**		**169-175**

Types of Course with abbreviations and Number Restriction on Types of Courses (as per institute guidelines)

- Foundation Course (FC): 10
- Professional Core Courses (PCC): 15 – 17.
- Professional Electives (PEL): 10
- Open Electives (OEL): 4
- Foundation Lab (FLAB): 10
- Professional Laboratories Courses (PLAB): 10
- Extra Academic Activity (EAA): 1+1(1st Sem & 2nd Sem) + 2
- Short Term Industrial / Research Experience (SIRE): 1
- Seminar & Technical Writing (STW): 2
- Project Work(PROJECT): 2
- Comprehensive Viva-Voce(CVV): 1