

STUDY AND EVALUATION SCHEME FOR LATERAL ENTRY AND ITI PASSES STUDENTS
Diploma in Mechanical Engineering(Refrigeration & Air conditioning) (Six Semester)
Semester: III

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External	End Semester Exam Type
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
1.	Thermal Engineering -I	4	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
2.	Fluid Mechanics & Hydraulic Machinery	4	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
3.	Fluid Mechanics & Hydraulic Machinery Lab	0	0	4	2	-	60	60	-	-	40	3	40	100	Practical	
4.	Workshop Practice	0	0	4	2	-	60	60	-	-	40	3	40	100	Practical	
5.	Measurements & Metrology	2	0	3	3	-	40	40	60	3	-	-	60	100	Practicum	
6.	Computer Aided Machine Drawing Practice	1	0	6	4	-	60	60	-	-	40	3	40	100	Practicum	
7.	Advance Skill Development OR	-	-	-	2	-	-	-	-	-	-	-	-	-	*Qualifying	
	*Open Elective-I	2	-	-		50	-	50	-	-	-	-	-			
8.	MINOR PROJECT**	-	-	-	1	-	50	50	-	-	-	-	-	-		
#Student Centred Activities (SCA)		-	-	6	-	-	50	50	-	-	-	-	-	50	-	
Total		13	0	23	20	80	320	400	180	-	120	-	300	700		

#Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc.

* **Qualifying paper** must have to pass, but the marks will not be added in awarded division or total marks.

***Tata Tech. Based Open Elective-I** subject will be offered preferably at the centers established by Tata Tech.

** Lateral entry students shall undertake a minor project and deliver a presentation on the same. This project will serve as an equivalent to summer internship-I for the

purpose of earning the associated credits and marks.

The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Note -

- 1) Each period will be 60 minutes duration.
- 2) Each session will be of 16 weeks.
- 3) Effective teaching will be at least 14 weeks.

Open Elective-I

- Material Handling Systems (AICTE)
- Energy Conservation & Audit (AICTE)
- Advanced Welding & Painting using Simulator (Tata Tech)
- Industrial Robotics & Automation (AICTE)
- Internet of Things (Tata Tech)
- Product Verification & Analysis (Tata Tech)

Advance Skill Development:

To fulfill the requirements for Advanced Skill Development, a minimum of 20 hours of skill certification is necessary. This certification must be obtained from a recognized national or international agency or institute. The assessment and certification process will be conducted by the respective agency or institute. Students must present their certificate to earn 02 credits for this subject.

A. COMPULSORY SUBJECT OF I & II SEMESTER MECHANICAL ENGINEERING TO BE TAUGHT IN III Sem. TO ITI PASSED STUDENTS OF TRADES ARE AS FOLLOWS :

TOOL & DIE MAKER(PRESS TOOLS, JIGS & FIXTURES), TOOL & DIE MAKER (DESIGN & MOULDS), MECHANIC MACHINE TOOLS MAINTENANCE), DRAUGHTMAN (MECHANICAL), MACHINIST, MACHINIST (GRINDER), FITTER, TURNER, MECHANIC(DOMESTIC COMMERCIAL, REFRIGERATION & AC), PRODUCTION & MANUFACTURING SECTOR, AUTOMOBILE SECTOR, REFRIGERATION AND AIRCONDITIONER SECTOR, FABRICATION (FITTING & WELDING), MECHANIC (MOTOR VEHICLE), MECHANIC (AGRICULTURE M/c)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week				Credits	MARKS IN EVALUATION SCHEME										Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P	Total		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
1.1	*MATHEMATICS-I	2	1	-	3	3	40	-	40	60	3	-	-	60	100		
1.2	*APPLIED PHYSICS-I	3	-	2	5	4	40	60	100	60	3	40	3	100	200		
1.3	*APPLIED CHEMISTRY	3	-	2	5	4	40	60	100	60	3	40	3	100	200		
1.4	*COMMUNICATION SKILLS IN ENGLISH	3	-	2	5	4	40	60	100	60	3	40	3	100	200		
TOTAL		11	1	6	18	15	160	180	340	240		120		360	700		

* Common with other diploma programmes

Student Centred Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

(*) It is compulsory to appear & to pass in examination From III Semester To VI Semester, But credit/marks will not be included for division and percentage of obtained marks.

(*) Four Semester (Two Years) of Extra Time will be given after diploma curriculum period (If Required) to pass the above paper (1.1 To 1.4 and 2.1 to 2.2) examination (As Per G. O. No. 2221/16-Pra. Shi.-3-2009 Dated 28-08-2009) & Revised G.O. No. 2704/16-Pra.Shi.-3-2013-46(8)/2002 Dated 09-01-2013 and B.T.E Order No. Pra.Shi.Pa/C.D.C./2022/872021 Dated 21.02.22

STUDY AND EVALUATION SCHEME FOR LATERAL ENTRY AND ITI PASSES STUDENTS
Diploma in Mechanical Engineering(Refrigeration & Air conditioning)(Six Semester)
Semester: IV

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External	Exam Type
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
1.	Strength of Materials	4	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
2.	Industrial Engineering & Management	4	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
3.	Strength of Materials Lab	0	0	6	3	-	60	60	-	-	40	3	40	100	Practical	
4.	Manufacturing Engineering	2	0	3	3	-	40	40	60	3	-	-	60	100	Practicum	
5.	Material Science & Engineering	1	0	4	3	-	60	60	-	-	40	3	40	100	Practicum	
6.	Thermal Engineering-II	1	0	4	3	-	60	60	-	-	40	3	40	100	Practicum	
7.	Advance Skill Development OR	-	-	-	2	-	-	-	-	-	-	-	-	-	*Qualifying	
	*Open Elective-II	2	-	-		50	-	50	-	-	-	-	-	-		
8.	*Essence of Indian Knowledge and Tradition (Q)	2	0	0	-	50	-	50	-	-	-	-	-	-	*Qualifying	
#Student Centred Activities (SCA)		-	-	3	-	-	50	50	-	-	-	-	-	50	-	
Total		16	0	20	20	80	270	350	180	-	120	-	300	650	-	

Industrial training of 4-6 weeks duration to be organized after 4th semester exam and will be evaluated in 5th sem.

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc.

* **Qualifying paper** must have to pass, but the marks will not be added in awarded division or total marks.

***Tata Tech. Based open elective-II** subject will be offered preferably at the centers established by Tata Tech.

The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Note -

- 1) Each period will be 60 minutes duration.
- 2) Each session will be of 16 weeks.
- 3) Effective teaching will be at least 14 weeks.

Open Elective-II

- Refrigeration & Air-conditioning
- Power Plant Engineering
- Disaster Management
- Inspection & Quality Control (Tata Tech)
- Advanced Automobile (Tata Tech)

Advance Skill Development:

To fulfill the requirements for Advanced Skill Development, a minimum of 20 hours of skill certification is necessary. This certification must be obtained from a recognized national or international agency or institute. The assessment and certification process will be conducted by the respective agency or institute. Students must present their certificate to earn 02 credits for this subject.

B. COMPULSORY SUBJECT OF I & II SEMESTER MECHANICAL ENGINEERING TO BE TAUGHT IN IV Sem. TO ITI PASSED STUDENTS OF TRADES ARE AS FOLLOWS :

TOOL & DIE MAKER(PRESS TOOLS, JIGS & FIXTURES), TOOL & DIE MAKER (DESIGN & MOULDS), MECHANIC MACHINE TOOLS MAINTENANCE), DRAUGHTSMAN (MECHANICAL), MACHINIST, MACHINIST (GRINDER), FITTER, TURNER, MECHANIC(DOMESTIC COMMERCIAL, REFRIGERATION & AC), PRODUCTION& MANUFACTURING SECTOR, AUTOMOBILE SECTOR, REFRIGERATION AND AIRCONDITIONER SECTOR, FABRICATION (FITTING & WELDING), MECHANIC (MOTOR VEHICLE), MECHANIC (AGRICULTURE M/c)

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week				Credits	MARKS IN EVALUATION SCHEME										TOTAL MARKS OF INTERNAL & EXTERNAL
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P	Total		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
2.1	*MATHEMATICS-II	3	1	-	4	4	40	-	40	60	3	-	-	60	100		
2.2	*APPLIED PHYSICS-II	3	-	2	5	4	40	60	100	60	3	40	3	100	200		
Total		6	1	2	9	8	80	60	140	120		40		160	300		

* Common with other diploma programme

Student Centred Activities will comprise of co-curricular activities like extension lectures, self-study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

Summer Internship (Industrial training) of 4 weeks duration to be organised after 4th semester exams

(*) It is compulsory to appear & to pass in examination From III Semester To VI Semester, But credit/marks will not be included for division and percentage of obtained marks.

(*) Four Semester (Two Years) of Extra Time will be given after diploma curriculum period (If Required) to pass the above paper (1.1 To 1.4 and 2.1 to 2.2) examination (As Per G. O. No. 2221/16-Pra. Shi.-3-2009 Dated 28-08-2009) & Revised G.O. No. 2704/16-Pra.Shi.-3- 2013-46(8)/2002 Dated 09-01-2013 and B.T.E Order No. Pra.Shi.Pa/C.D.C./2022/872021 Dated 21.02.22

Semester: V

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credit	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External	Exam Type
		L	T	P		INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
						Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
1.	Summer Internship-II (4-6 Weeks)	-	-	-	2	-	60	60	-	-	40	3	40	100	Practical	
2.	Theory of Machines & Mechanisms	4	0	0	4	40	-	40	60	3	-	-	60	100	Theory	
3.	Design of Machine Elements	4	0	0	4	40	-	40	60	3	-	-	60	100	Theory	
4.	Minor Project	0	0	8	4	-	60	60	-	-	40	3	40	100	Practical	
5.	Program Specific Subject (Practicum) • Refrigeration Plant, Erection & Servicing	3	0	3	4	-	40	40	60	3	-	-	60	100	Practicum	
6.	Advance Skill Development OR Open Elective-III (Anyone from the list)	2	0	-	2	50	-	50	-	-	-	-	-	-	Qualifying	
7.	Indian Constitution	2	0	0	0	50	-	50	-	-	-	-	-	-	Qualifying	
#Student Centred Activities (SCA)		-	-	10	-	-	50	50	-	-	-	-	-	50	-	
Total		15	0	21	20	80	210	290	180	-	80	-	260	550	-	

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc.

Note -

- 1) Each period will be 60 minutes duration.
- 2) Each session will be of 16 weeks.
- 3) Effective teaching will be at least 14 weeks.

Open Elective-III (Any one) :

SR. NO.	SUBJECT NAME
	Computer Aided Design & manufacturing
1.	Reverse Engineering
2.	Artificial Intelligence
3.	Automobile Engineering
	Any Course Of Minimum 02 Credit From (Advance Skill Development) • NPTEL • MOOCS THROUGH SWAYAM • AICTE-ELIS AND CENTRALLY FUNDED TECHNICAL INSTITUTES • C-DAC • CERTIFICATES CONDUCTED BY THE INSTITUTE OF NATIONAL IMPORTANCE (IIT, NIT, IIT ETC.) • ISRO E-LEARNING • COURSES OFFERED BY TATA TECHNOLOGY (Annexure-1) OR OTHER REPUTED ORGNISATION. - o Electric Vehicle (Tata Tech) - o Fundamentals of Innovation & Design Thinking (Tata Tech)

* **Qualifying paper** must have to pass, but the marks will not be added in awarded division or total marks.

* **Practicum subjects** are to be evaluated by theory or practical examinations as mentioned in above scheme.

***Tata Tech. Based** Open Elective-I subject will be offered preferably at the centers established by Tata Tech.

The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Advance Skill Development:

To fulfill the requirements for Advanced Skill Development, a minimum of 20 hours of skill certification is necessary. This certification must be obtained from a recognized national or international agency or institute. The assessment and certification process will be conducted by the respective agency or institute. Students must present their certificate to earn 02 credits for this subject.

Semester: VI
A: Normal Pathways

Sr. No .	SUBJECTS	STUDY SCHEME Periods/Week			Credit	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External	Exam type
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
1	Project	-	-	24	12	-	240	240	-	-	160	3	160	400	Practical	
1. 2	Entrepreneurship and Start-ups **	2	0	0	2	40	-	40	60	3	-	-	60	100	Practical	
2. 3	Elective Pathway: (Any One) • Advanced Engineering Mathematics • Additive Manufacturing • Project Management • Finance Fundamentals • Industry 4.0	3	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
3. 4	Elective Specialization (Any One): • Green Energy & Engineering • Maintenance of Machine Tools • Non-Destructive Testing • Product Design & Development	3	0	0	3	40	-	40	60	3	-	-	60	100	Theory	
#Student Centred Activities (SCA)		-	-	4	-	-	50	50	-	-	-	-	-	50	-	
Total		08	0	28	20	120	290	410	180	-	160	-	340	750	-	

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc.

Note -

- 1) Each period will be 60 minutes duration.
- 2) Each session will be of 16 weeks.
- 3) Effective teaching will be at least 14 weeks.

** Common with other Engineering diploma courses

Elective Pathway: (Any One)

- Advanced Engineering Mathematics
- Additive Manufacturing
- Project Management
- Finance Fundamentals
- Industry 4.0

Elective Specialization (Any One):

- Green Energy & Engineering
- Maintenance of Machine Tools
- Non-Destructive Testing
- Product Design & Development

* **Qualifying paper** must have to pass, but the marks will not be added in awarded division or total marks.

* **Practicum subjects** are to be evaluated by theory or practical examinations as mentioned in above scheme.

***Tata Tech. Based** Open Elective-I subject will be offered preferably at the centers established by Tata Tech.
The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Semester: VI
B: Internship Pathway

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External	Exam Type
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT							
		L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot			
6.1	**Entrepreneurship And Start-Ups (Online Mode)	-	-	-	2	-	-	-	100	3	-	-	100	100	Theory	
6.2	Industry Hands on Practice	-	-	-	4	-	-	-	-	-	-	-	-	350	-	
	Industrial Project	-	-	-	12	-	-	-	-	-	-	-	-	200	-	
	Seminar (In Institute)	-	-	-	2	-	100	100	-	-	-	-	-	100	Seminar	
Total		-	-	-	20	-	100	100	100	-	-	-	100	750	-	

** Common with another diploma programme

NOTE:

1. The Industrial training tenure should not be less than 4 months.
2. Industry must be registered with MSME / Directorate of industries/Limited Organization/ State/Central Government establishments.
3. Monthly progress reports of Intern/ Trainee should be attested and forwarded by industrial supervisor (allotted to Intern/Trainee) during industrial Internship/Training.
4. The Industrial unit/organisation must evaluate students using the format provided by polytechnic in the form of marks.
5. The Industrial Hands on Practice, Industrial Project and seminar must be evaluated on the basis of the BTE Internship / Training Policy -2025.
6. "Entrepreneurship and Start-up" course is also mandatory in Industrial internship/training mode. It will be conducted online mode by his/her polytechnic institute. After completing the online course, students must appear for exam conducted by the Board of Technical Education, Lucknow.