

M.Tech. in Production & Industrial Engineering

University-Style Syllabus (2 Years / 4 Semesters)

Programme Duration: 2 Years (4 Semesters)

Programme Level: Postgraduate (M.Tech.)

Credits: 68–80 (AICTE/NEP Model Curriculum)

Semester I

Subject Code	Subject	L	T	P	Credits
MPI101	Advanced Manufacturing Processes	3	1	0	4
MPI102	Production Planning and Control	3	1	0	4
MPI103	Industrial Engineering and Operations Research	3	0	2	4
MPI104	Research Methodology	2	0	2	3
MPI105	Manufacturing Laboratory – I	0	0	4	2
MPI106	Seminar – I	0	0	2	1

Total Credits: 18

Semester II

Subject Code	Subject	L	T	P	Credits
MPI201	Computer Integrated Manufacturing (CIM)	3	1	0	4
MPI202	Quality Engineering and Six Sigma	3	0	2	4
MPI203	Supply Chain and Logistics Management	3	0	2	4

Subject Code	Subject	L	T	P	Credits
MPI204	Automation and Robotics	3	0	2	4
MPI205	Manufacturing Laboratory – II	0	0	4	2
MPI206	Seminar – II	0	0	2	1

Total Credits: 19

Semester III

Subject Code	Subject	L	T	P	Credits
MPI301	Lean Manufacturing and Industry 4.0	3	1	0	4
MPI302	Advanced Production Systems	3	0	2	4
MPI303	Engineering Optimization	3	0	2	4
MPI304	Elective – I	3	0	0	3
MPI305	Dissertation Phase – I	0	0	12	8

Elective – I (Choose One)

- MPI311 – Additive Manufacturing
- MPI312 – Smart Manufacturing Systems
- MPI313 – Maintenance Engineering
- MPI314 – Advanced Welding Technology
- MPI315 – Product Design and Development

Total Credits: 23

Semester IV

Subject Code	Subject	L	T	P	Credits
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Subject Code	Subject	L	T	P	Credits
MPI401	Dissertation Phase – II	0	0	24	16
MPI402	Viva Voce	0	0	2	2
MPI403	Industrial Internship	0	0	8	4

Total Credits: 22

Laboratory Courses

Code	Laboratory
MPI105	Manufacturing Laboratory – I
MPI205	Manufacturing Laboratory – II
MPI305	Research and Dissertation Work
MPI401	Dissertation and Project Implementation

Detailed Unit-Wise Syllabus

MPI101 – Advanced Manufacturing Processes

Unit I

- Conventional Manufacturing Processes
- Advanced Machining Techniques

Unit II

- Non-Traditional Manufacturing Processes
- EDM, ECM, Laser Machining

Unit III

- Precision Manufacturing
- Micro and Nano Manufacturing

Unit IV

- Additive Manufacturing Technologies

Unit V

- Sustainable Manufacturing
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MPI102 – Production Planning and Control

Unit I

- Production Systems
- Forecasting Techniques

Unit II

- Aggregate Planning
- Capacity Planning

Unit III

- Inventory Management
- Material Requirement Planning (MRP)

Unit IV

- Scheduling Techniques

Unit V

- Production Performance Measurement
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MPI202 – Quality Engineering and Six Sigma

- Statistical Quality Control
- Process Capability Analysis
- Six Sigma Methodology (DMAIC)
- Lean Quality Systems

- Quality Improvement Tools
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MPI204 – Automation and Robotics

- Industrial Automation
 - Robotics Fundamentals
 - PLC and CNC Systems
 - Flexible Manufacturing Systems (FMS)
 - Automated Material Handling
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Practical List

Students should perform practical exercises such as:

- CNC Programming and Machining
 - CAD/CAM Applications
 - Production Planning using ERP Software
 - Statistical Process Control (SPC)
 - Six Sigma Analysis
 - PLC Programming
 - Industrial Robot Programming
 - Manufacturing Simulation
 - Supply Chain Optimization
 - Additive Manufacturing (3D Printing)
 - Lean Manufacturing Case Studies
 - Industry-Oriented Capstone Project
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Examination Scheme

Component	Marks
End Semester Examination	70
Internal Assessment	30
Practical Examination	100

Component	Marks
Seminar	100
Dissertation	300
Viva Voce	100

Recommended Reference Books

- Manufacturing Engineering and Technology
- Production and Operations Management
- Operations Research: An Introduction
- Automation, Production Systems, and Computer-Integrated Manufacturing
- Lean Thinking

Programme Outcomes

Upon successful completion of the programme, graduates will be able to:

1. Design, manage, and optimize advanced production and manufacturing systems.
2. Apply industrial engineering techniques to improve productivity and operational efficiency.
3. Implement quality management, Lean, and Six Sigma methodologies in manufacturing environments.
4. Integrate automation, robotics, and Industry 4.0 technologies into production systems.
5. Analyze and optimize supply chain and logistics operations.
6. Conduct research and develop innovative solutions in production and industrial engineering.
7. Lead manufacturing, operations, and industrial engineering projects in diverse industries.
8. Pursue doctoral research or advanced professional careers in Production, Manufacturing, and Industrial Engineering.