



### COURSE DETAILS:

<b>Degree</b>	B.E.		
<b>Programme Name</b>	Mechanical engineering		
<b>Course Code &amp; Title</b>	<b>ME 5081: Process Planning &amp; Cost Estimation</b>		
<b>Credits</b>	3	<b>Session</b>	Jan – May 2024
<b>Course Type</b>	Elective	<b>Section</b>	A
<b>Name of the Faculty</b>	<b>Mr. P.Mani</b> Teaching Fellow, Department of Production Technology, MIT, Anna University, Chennai.		

**Syllabus:** (Approved Syllabus as per Regulation 2019)

Defining process planning –Drawing interpretation –Material selection process and methods – Selection of Production Processes from Tables – Selection of Process Parameters from Tables– Factors to be considered in selecting: Processes; Process Sequencing; Operation Sequencing; Equipment & Tool Selection; Tool Holding Devices; Measuring Instruments –Computer Aided Process Planning – Retrieval / Variance CAPP and Generative CAPP - Case Study in Process Planning.

Concept and Purpose of Estimating, Functions of Estimating Department, Concept of Costing, Costing versus Estimating, Types of Estimates, Importance of Estimates, Estimating Procedure, Cost Estimators and their Qualifications, Principal Constituents in a Cost Estimate – Elements of Cost – Introduction, Material Cost, Labour Cost, Expenses and Cost of Product (Ladder Cost).

Overheads , Allocation or Distribution of Overhead Cost , Depreciation and Methods to Calculate it, Interest on Capital, Idleness Costs, Repair and Maintenance Cost

### Estimation of cost for Casting processes, Welding processes and Forging processes.

Estimation of Machining Time and Cost – Lathe operations, Drilling, Milling, Shaping Planing, and Grinding operations.



**Text Books:**

1. Adithan, M, Process Planning and Cost Estimation, New Age International Publishers, 2007.
2. Peter Scallan, Process planning, The Design/Manufacture Interface, Butterworth-Heinemann, 2003.

**References:**

1. Chitale A. K., and Gupta R. C., "Product Design and manufacturing", Prentice Hall of India, New Delhi, 1997.
2. Gideon Halevi, "Process and operation planning", Kluwer academic publishers (Printed ebook), 2003.
3. Narang G.B.S. & Kumar .V, "Production and Costing", Khanna Publishers, 2000.
4. Phillip F. Ostwald & Jairo Munoz, "Manufacturing Processes And Systems", 9th Edition, Wiley student edition, 2002.
5. Robert Creese, Adithan M. & Pabla B. S., "Estimating and Costing for the Metal Manufacturing Industries", Marcel Dekker, 1992.

**COURSE LEARNING OBJECTIVES**

The main learning objective of this course is to prepare the students for:

1. Creating a process plan for a given Product.
2. Preparing cost elements for a given product.
3. Allocating overhead to different departments.
4. Estimating cost for the casting and forging products.
5. Analyzing the costs for machining a product.

**COURSE OUTCOME (CO)**

Upon completion of this course, the students will be able to:

1. Create a Process Plan for a given Product.
2. Prepare Cost elements for a given Product.
3. Allocate Overhead to different departments.
4. Estimate cost forth Casting and Forging products.
5. Analyze the costs for machining a product.

**COURSE ARTICULATION MATRIX**

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	2	2	-	-	-	-	-	-	1	1	2	-	-
2	3	3	2	1	-	-	-	-	-	-	1	1	2	-	-
3	3	3	2	2	-	-	-	-	-	-	1	1	2	-	-
4	3	3	2	2	-	-	-	-	-	-	1	1	2	-	-
5	3	3	2	2	-	-	-	-	-	-	1	1	2	-	-

The correlation levels: 1: Low; 2: Medium; 3: High.



## COURSE ALIGNED PROGRAMME OUTCOMES (PO) & PROGRAMME SPECIFIC OUTCOMES (PSO)

PO	Graduate Attribute	Programme Outcome
1	Engineering knowledge	Apply knowledge of mathematics, basic science and engineering science.
2	Problem analysis	Identify, formulate and solve engineering problems.
3	Design/development of solutions	Design a system or process to improve its performance, satisfying its constraints.
4	Conduct investigations of complex problems	Conduct experiments & collect, analyze and interpret the data.
5	Modern tool usage	Apply various tools and techniques to improve the efficiency of the system.
6	The Engineer and society	Conduct selves to uphold the professional and social obligations.
7	Environment and sustainability	Design the system with environment consciousness and sustainable development.
8	Ethics	Interacting industry, business and society in a professional and ethical manner.
9	Individual and team work	Function in a multidisciplinary team.
10	Communication	Proficiency in oral and written Communication.
11	Project management and finance	Implement cost effective and improved system.
12	Life-long learning	Continue professional development and learning as a life-long activity.

PSO	Graduates demonstrate
1	Apply the knowledge gained in Mechanical Engineering for design and development and manufacture of engineering systems.
2	Apply the knowledge acquired to investigate research oriented problems in mechanical engineering with due consideration for environmental and social impacts.
3	Use the engineering analysis and data management tools for effective management of multidisciplinary projects.

## COURSE TENTATIVE SCHEDULE / PLAN

Week	Day	Date	Hrs	Unit	Topics	Text / Ref.
1	1	01/02/2024	2	1	Defining process planning –Drawing interpretation	T2
	2	02/02/2024	1	1	Material selection process and methods – Selection of Production Processes from Tables	T2
2	3	07/02/2024	2	1	Selection of Process Parameters from Tables	T2
	4	08/02/2024	1	1	Factors to be considered in selecting: Processes; Process Sequencing; Operation Sequencing;	T2
3	5	15/02/2024	2	1	Equipment & Tool Selection; Tool Holding Devices; Measuring Instruments	T2
	6	16/02/2024	1	1	Computer Aided Process Planning – Retrieval / Variance CAPP and Generative CAPP - Case Study in Process Planning.	T2
4	7	22/02/2024	2	2	Concept and Purpose of Estimating, Functions of Estimating Department	T2
	8	23/02/2024	1	2	Concept of Costing	T2



5	9	29/02/2024	2	2	Costing versus Estimating, Types of Estimates, Importance of Estimates	T2
	10	01/03/2024	1	2	Estimating Procedure, Cost Estimators and their Qualifications, Principal Constituents in a Cost Estimate	T2
6	11	07/03/2024	2	2	Elements of Cost – Introduction, Material Cost, Labour Cost	T2
	12	08/03/2024	1	2	Expenses and Cost of Product (Ladder Cost)	T2
7	13	14/03/2024	2	3	Overheads , , , Interest on Capital, Idleness Costs,	T2
	14	15/03/2024	1	3	Allocation or Distribution of Overhead Cost	T2
8	15	21/03/2024	2	3	Depreciation and Methods to Calculate it	T2
	16	22/03/2024	1	3	Interest on Capital	T2
9	17	28/03/2024	2	3	Idleness Costs	T2
	18	29/03/2024	1	3	Repair and Maintenance Cost	T2
10	19	04/04/2024	2	4	Estimation of production cost for Casting processes.	T2
	20	05/04/2024	1	4	„	T2
11	21	11/04/2024	2	4	Estimation of production cost for Welding processes.	T2
	22	12/04/2024	1	4	„	T2
12	23	18/04/2024	2	4	Estimation of production cost for Forging processes.	T2
	24	19/04/2024	1	4	„	T2
13	25	25/04/2024	2	5	Estimation of Machining time & Cost estimation for Lathe operations.	T2
	26	26/04/2024	1	5	Estimation of Machining time & Cost estimation for Drilling.	T2
14	27	02/05/2024	2	5	Estimation of Machining time & Cost estimation for Milling.	T2
	28	03/05/2024	1	5	Estimation of Machining time & Cost estimation for Shaping.	T2
15	29	09/05/2024	2	5	Estimation of Machining time & Cost estimation for Planing.	T2
	30	10/05/2024	1	5	Estimation of Machining time & Cost estimation for Grinding.	T2

#### COURSE DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓ Chalk & Talk	✓ Stud. Assignments	✓ Web Resources
✓ LCD/Smart boards	✓ Stud. Seminars	□ Add-On Courses



**COURSE ASSESSMENT METHODOLOGIES-DIRECT**

<input checked="" type="checkbox"/> University (End Semester) Examination		<input checked="" type="checkbox"/> Internal Assessment Tests	
<input checked="" type="checkbox"/> Assignments	<input type="checkbox"/> Laboratory Practices	<input type="checkbox"/> Mini/Major Projects	<input checked="" type="checkbox"/> Stud. Seminars
<input type="checkbox"/> Viva Voce	<input type="checkbox"/> Certifications	<input type="checkbox"/> Add-On Courses	<input type="checkbox"/> Others

**COURSE ASSESSMENT METHODS**

S.N.	Mode of Assessment	Date	Duration	% Weight
1	Internal Assessment Tests 1		1½ hr	25 %
2	Internal Assessment Tests 2		1½ hr	25 %
3.	University Examination		3 hr	50 %
Additional marks may be given for Assignments / Group / Team Seminar Presentation)				

**COURSE ASSESSMENT METHODOLOGIES-INDIRECT**

<input checked="" type="checkbox"/> Assessment of CO (By Feedback, Once)	<input checked="" type="checkbox"/> Student Feedback On Faculty (Once)
<input type="checkbox"/> Assessment of Mini/Major projects by Ext. Experts	<input type="checkbox"/> Others

**COURSE (EXTRA) ESSENTIAL READINGS:**

1. NPTEL – Engineering Drawing, available at <https://nptel.ac.in/courses/112103019/>
2. NPTEL – Advanced Manufacturing Process, available at <https://nptel.ac.in/courses/112107078/>
3. NPTEL – Manufacturing Processes I, available at <https://nptel.ac.in/courses/112107144/>
4. NPTEL – Manufacturing Process II, available at <https://nptel.ac.in/courses/112105127/>
5. NPTEL – Metal Casting, available at <https://nptel.ac.in/courses/112107083/>
6. NPTEL – Fundamentals of welding Science and Technology, available at <https://nptel.ac.in/courses/112103263/>

**COURSE EXIT SURVEY** (will be collected at end of the course)

The purpose of this survey is to find out from students about their learning experiences and their thoughts about the course.

Rating:	1: Slight (Low)	2: Moderate (Medium)	3: Substantial (High)
CO1:			
CO2:			
CO3:			
CO4:			
CO5:			



### **COURSE POLICY (Compensation Assessment)**

1. Attending all the assessment is mandatory for every student
2. Course policy will be followed as per the academic course regulation

### **COURSE ACADEMIC DISHONESTY AND PLAGIARISM**

1. All rules and regulation prescribed by the ACOE, University Departments, are applicable in the Internal Assessment Tests and University (End Semester) Examinations. ([https://acoe.annauniv.edu/download\\_forms/student\\_forms/Guidelines.pdf](https://acoe.annauniv.edu/download_forms/student_forms/Guidelines.pdf))
2. In general, possessing a mobile phone, carrying bits of paper with materials, talking to other students, copying from other students during Internal Assessment Tests and University (End Semester) Examinations will be treated as Malpractice and punishable as per the rules and regulations. The misuse of Assignment / Project / Seminar works from others is considered as academic dishonesty and will be treated with the rules and regulations of the University.

### **COURSE ADDITIONAL INFORMATION**

Queries / clarifications / discussion (if required) may be e-mailed to / contact the course instructors during their Office Hours.

For Approval

  
Course Faculty

  
Course Coordinator

HOD (Mech)