

### ME 4015: Industrial Management

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/week Credits: 3	Class Test 1 – 15 marks Class Test 2 – 15 marks Teacher's Assessment – 10 marks End Sem Exam-60

**Course description:** After completion of the course, students will have understanding of the various functions of Production Management. They will have knowledge of all the Production related activities. The student will have a holistic view of management as a whole which will help him at looking at the problems from an interdepartmental perspective. Students will acquire skills necessary for a works manager.

#### Course Objectives:

- 1) To understand the dynamics nature of private and public administration related to production activity.
- 2) To understand the concept of human resource and its development in production related activities.
- 3) To study the financial implications of production.
- 4) To evaluate the different types of industrial ownerships.
- 5) To understand the different administrative controls operating on the employees.

#### Course Outcome

After completing the course, students will be able to:

- 1) Understand the principles and remember the applications of principles of management related to public and private administration in relation to production activities.
- 2) Apply human relation skills for motivating the employees.
- 3) Develop Logical and Analytical ability to apply analyze problems related to production activity.
- 4) Understand the working of public sector undertakings and their production problems.
- 5) Understand the authority and responsibility of a production manager.

#### Detailed Syllabus:

<b>Unit 1</b> Meaning, scope and significance of Public and Private production Administration; Difference and similarity between public and Private production administration, Challenges of liberalization, Privatisation, Globalisation.
<b>Unit 2</b> Importance of human resource development in production activity, Production related functions: Recruitment, training, career advancement, position classification, discipline, performance appraisal, promotion, pay and service conditions; employer-employee relations, grievance redressal mechanism; Code of conduct; Administrative ethics.
<b>Unit 3</b> Organisation and methods, Work study and work management; Management aid tools like network analysis, MIS, PERT, CPM.
<b>Unit 4</b> Weber's bureaucratic model – its critique and post-Weberian Developments, Public sector in modern India; Forms of Public Sector Undertakings; Problems of autonomy, accountability and control; Impact of liberalization and privatization

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**Unit 5** Concepts of accountability and control, Workers, Citizen and Administration ,Theories of Leadership: Traditional and Modern, Process and techniques of decision-making, Simon's decision-making theory.

**Text and Reference Books**

- 1) Terry and Frankline, "Principles of management", Pub. A I T B S
- 2) Stephen P Robbins, "Organisation Behaviour", Prentice Hall International, Inc.
- 3) Keith Davis, "Human Behaviour at work", Pub. McGraw-Hill series
- 4) Paul Hersey & Ken Blanchard, "Management of organizational behavior", Pub. Prentice Hall.
- 5) Nicholas Henry, "Public Administration and Public Affairs", Pub. PHI Learning

**Mapping of Course out come with programme outcome**

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1										
CO2			1		2	1				
CO3			1		3	2				
CO4										
CO5					2	2				

**Assessment Pattern**

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	05	02	10
K2	Understand	10	03	10
K3	Apply	10	03	20
K4	Analyze	05	02	20
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		30	10	60

**Assessment table**

Assessment Tool	K1	K2	K3	K4	K5
COs	CO1	CO1	CO3	CO4	CO5
Class Test (15+15 Marks)	06	06	06	06	06
Teachers Assessment (10 Marks)	02	03	01	02	02
ESE Assessment (60 Marks)	12	12	12	12	12


  
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### ME 4016 COSTING & COST ESTIMATION

<b>Teaching Scheme</b> Lectures: 3 hrs/week Credits: 3	<b>Examination Scheme</b> Class Test 1 – 15 marks Class Test 2 – 15 marks Teacher's Assessment – 10 marks End Sem Exam-60
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#### Objectives:

1. To, understand the principles costing, estimation and control of industrial product
2. Be able to apply costing tools.
3. To understand and analyse the effect of product cost on customer and manufacturer
4. To understand the contemporary trends in costing and cost control in industries

#### Outcomes:

1. Understand the procedure of Estimation & Budget cost estimation
2. Apply basic calculation in manufacturing processes.
3. Analyze the cost components.
4. Estimate the Total cost from Raw materials to finished product including Power cost.
5. Cost Control and Cost Reduction techniques

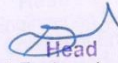
**Unit 1:Introduction of cost & Cost Estimation:** Concept of cost, cost unit, cost centre, classification & element of cost, different costs for different purposes. Costing methodology for raw materials, Products and Services, cost-price-profit equation Cost Estimation: Definition, purpose and functions of estimation, role of estimator, constituents of estimates, estimating procedures. Source of finance

**Unit 2:Estimation of Weight, Material and fabrication Cost:**Process of breaking down product drawing in to simpler elements or shapes, estimating the volume, weight and cost Review of purchasing procedure, recording of stock and consumption of material by LIFO, FIFO, direct cost and indirect cost, Procedure of estimation of fabrication cost, forging cost, machining cost and of machine hour rate

**Unit 3:Cost Accounting Methods:**Job costing, Batch costing, Unit costing, Process costing, Contract costing, Activity based costing, for industrial products

**Unit 4 :Cost Control:**Use of cost data for policymaking and routine operation, control techniques such as budgetary control, standard cost, variance analysis, marginal cost and break even analysis

**Unit 5:Cost Reduction Areas:** Procedures and systems in product, methods and layouts, administrative and marketing, rejection analysis, cost of poor quality, value analysis and value engineering, Zero Base Budgeting



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### Reference Books

1. Process Planning & Cost Estimation Edited by Dennis Lock, B & H Ltd. 2 Handbook of Engineering Management Edited by Dennis Lock, B & H Ltd
2. Principles & Practice of Cost Accounting – N. K. Prasad (Book Syndicate Pvt. Ltd.)
3. Costing Simplified: Wheldom Series – Brown & Owier (ELBS)
4. Cost Accounting: B. Jawaharlal (TMH)
5. Cost Accounting: R.R. Gupta.
6. Cost Accounting, 13/e - B. K. Bhar, (Academic Publishers, Kolkata)
7. Cost Accounting: Jain, Narang (Kalyani Publishers)
8. A Text Book of Estimating and Costing Mechanical – J.S. Charaya & G. S. Narang (SatyaPrakashan)
9. Mechanical Estimation and Costing – TTTI, Chennai (TMH)
10. Theory & Problems of Management & Cost Accounting – M.Y. Khan, P. K. Jain (TMH)

**Teacher's Assessment:** Teachers Assessment of 20 marks is based on one of the / or combination of few of following

Student's Presentation on related topics

Mapping of Course out come with programme outcome

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1				3						
CO2	3				2		2		2	
CO3		2				3				
CO4					3					
CO5		3								

### Assessment Pattern

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	05	05	10
K2	Understand	05	05	10
K3	Apply	05	05	20
K4	Analyze	05	05	20
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		20	20	60

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**Assessment table**

Assessment Tool	K1	K2	K3	K4	K5
COs	CO1	CO1/CO5	CO3	CO4/CO2	CO5
Class Test (20 Marks)	03	05	03	03	06
Teachers Assessment (20 Marks)	04	03	03	05	05
ESE Assessment (60 Marks)	12	05	10	15	18

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**ME 4030: Engineering Economics**

<b>Teaching Scheme</b>	<b>Examination Scheme</b>
Lectures: 3 Hrs/Week	Class Test I : 15 Marks
Credits: 3	Class Test II : 15 Marks
	Teachers Assessment : 10 Marks
	End Semester Exam : 60 Marks

**Prerequisites:**ME4015-Industrial Management

**Course description:** This course consists of basic understanding of various types renewable energies like solar energy, wind energy, biomass energy, hydro energy etc and their sources and applications. It will give the knowledge of conversion of renewable energies into useful form of electrical energy. This also consist of various types of power plants based on renewable energy and their economical analysis.

**Course Objectives**

1. Introduction to solar energy, their resources and collections.
2. Introduction to wind energy and wind turbines.
3. Understand biomass and biogas and their conversions.
4. Introduction to fuel cells, types and applications.
5. Introduction to various power plants.
6. Analyze economic analysis of power plants.

**Course Outcome.**

After completing the course, students will be able to:

CO1	Be able to apply concepts of economic analysis to a manufacturing industries.
CO2	Be able to understand Break Even Analysis, Standard Costing, Marginal Costing.
CO3	Be able to apply probabilistic risk analysis methods..
CO4	Be able to understand budgeting

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**Detailed Syllabus:**

Unit1	Introduction :Engineering and Economics, Definition and scope of Engineering Economics, Time value of money : Simple and compound interest, Time value equivalence, Compound interest factors, Cash flow diagrams, Calculation, Calculation of time –value equivalences. Present worth comparisons, Comparisons of assets with equal, unequal and infinite lives, comparison of deferred investments, Future worth comparison, payback period comparison
Unit2	Fund flow analysis, concepts, objectives, techniques of Fund flow statement. Ratio analysis: Classification of ratios, structural group, standards for comparison limitations of Ratio analysis, returns on investment and integral ratio. Cost volume profit analysis: mechanics of break even chart, profit planning and break-even analysis, margin of safety..
Unit3	Standard Costing:- Concept, Development and use of Standard Costing, Budget and Budgetary Control, Variance Analysis. Marginal Costing:- Use of Marginal Costing in Decision Making. Allocation of Resources: Capital Budgeting: Control of Capital Expenditure, Evaluation Process – Payback approach, Accounting of Rate of Return, Present Value Method Vs Internal Rate of Return.
Unit4	Introduction to Cost Control, Significance for Engineers, Limitations of Financial Accounting, Corporate Objectives, Profitability and other objectives, Product, Services and Market Mix. Elements of Cost:- Material, Labour, Expenses, Overheads, Direct and Indirect Cost, Fixed and Variable Cost, other classifications
Unit5	Cost of Capital: Relevant Cost, Measurement of Cost of Capital, Cost of Debt, Preference Shares, Equity Shares, Internal Financing, Dividends, Cost of Retained Earnings Concept Cost Allocation:- Cost Accumulation and Allocation, Allocation of cost of Service Departments – Reciprocal Method, Allotting cost from one department to other Depreciation, Various methods for calculation.

**Text Books**



1. Prasad N. K., Cost Accounting Book Syndicate Pvt.Ltd.. Kolkata
2. C. B.Gupta, Fundamentals of Business, Sultan Chand & Co

**Reference Books .**

1. Henry M. Stenier, engineering economics Principles, Mc Grow hill Publication.
2. P. A. Samuelson, Economics, Mc Grow hill International.
3. Colin Drury, management and Cost Accounting, English Language Book Society, Chapman & Hall Landon.
4. Basu S.K., Sahu K.C and Rajiv B, Industrial Organization and Management –. PHI New Delhi, 2012.

**Mapping of Course outcome with Program Outcomes**

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	1		1	2	1			

  
  
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CO2	3	1	1	1	2	1				
CO3	3	2	2	1	1	2				
CO4	3	2	3		1	1				
CO5	3	2	1				1			
CO6	3	2	1							

**1 – High 2 – Medium 3 - Low**

**Teacher's Assessment:** Teachers Assessment of 10 marks is based on one of the / or combination of few of following

- 1) Question & answer / Numerical solution
- 2) Power point presentation of case studies of thermodynamic system
- 3) Test consisting of multiple choice questions

**Assessment Pattern**

Assessment Pattern Level No.	Knowledge Level	Test I	Test II	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	03	03	02	10
K2	Understand	04	04	02	10
K3	Apply	03	03	02	20
K4	Analyze	05	05	02	20
K5	Evaluate	00	00	02	00
K6	Create	00	00	00	00
Total Marks 100		15	15	10	60

**Assessment table**

Assessment Tool	K1	K2	K3	K4	K5
Cos	CO1	CO1/CO5	CO3	CO4/CO2	CO5
Class Test (15 Marks)	03	04	03	03	02
Class Test (15 Marks)	03	04	03	03	02
Teachers Assessment (10 Marks)	02	02	02	02	02
ESE Assessment (60 Marks)	12	05	10	15	18

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**ME 4031: Renewable Energy Engineering.**

<b>Teaching Scheme</b>	<b>Examination Scheme</b>
Lectures: 3 Hrs/Week	Class Test I : 15 Marks
Credits: 3	Class Test II : 15 Marks
	Teachers Assessment : 10 Marks
	End Semester Exam : 60 Marks

**Prerequisites:** ME1001 Basics of Mechanical Engineering

**Course description:** This course consists of basic understanding of various types renewable energies like solar energy, wind energy, biomass energy, hydro energy etc and their sources and applications. It will give the knowledge of conversion of renewable energies into useful form of electrical energy. This also consist of various types of power plants based on renewable energy and their economical analysis.

**Course Objectives**



7. Introduction to solar energy, their resources and collections.
8. Introduction to wind energy and wind turbines.
9. Understand biomass and biogas and their conversions.
10. Introduction to fuel cells, types and applications.
11. Introduction to various power plants.
12. Analyze economic analysis of power plants.

**Course Outcome.**

After completing the course, students will be able to:

CO1	Accustom with type of renewable energies and systems.
CO2	Understand various types of renewable energy sources and applications.
CO3	Analyze the economic considerations of power plants.
CO4	Define various renewable energy terms.
CO5	Understand various energy storage systems.

**Detailed Syllabus:**

   
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Unit1	<b>Solar Energy.</b> Introduction, Applications, terms and definitions, merits and demerits, solar constant, solar insolation, Tilt angle of the fixed flat plate collector, different types of collectors(solar thermal modified flat plate ,parabolic through, paraboloidal dish),solar photovoltaic cell principal, V-I characteristics, efficiency of solar cell.
Unit2	<b>Wind energy.</b> Introduction, application, merits and limitations, wind energy quantum, wind power density, power in wind stream, wind turbine efficiency, wind velocity duration curve, Wind turbines. Terms and definitions, types, horizontal axis propeller type wind turbine, three blade horizontal axis wind turbine, vertical axis wind turbine, power duration curve, economic considerations.
Unit3	<b>Biomass and Hydro Energy.</b> Biomass. Introduction, origin of biomass, biomass energy resources, biomass conversion processes, direct combustion of biomass, thermochemical conversion of biomass, biochemical conversion, fermentation, raw biomass material for conversion to biogas, agriculture waste and energy, aquatic biomass, raw material for biogas production, significance of biogas plants in India's energy strategy, average composition of biogas, anaerobic fermentation, types of biogas plants. Hydro energy. Introduction, merits and demerits, hydro-electric energy resources in India, types of hydro-electric plants, energy conservation scheme, terms and definitions, typical hydro-electric power plants, classification of hydro-electric turbines, impulse turbine and reaction turbine, merits of hydro turbine
Unit4	<b>Energy Storage Systems and Fuel Cells.</b> Energy Storage. Introduction, pump hydro energy storage plant, underground pumped hydro, compressed air energy storage(CAES), solar energy storage, battery energy storage systems, thermal energy storage systems Fuel Cells. Introduction, advantages of fuel cell, theory of electro-chemistry, principal and operation, classification and types, fuels for fuel cells, schematic of fuel cell power plant, acidic and alkaline electrolyte fuel cells, molten carbonate fuel cells, solid oxide fuel cells, methanol and hydrazine fuel cells
Unit5	<b>Power Plants.</b> Solar thermal power plants, solar pond, wind turbines, wind power plants, generators sets, horizontal axis, vertical axis, wind energy farms, fuel cells power plants, biogas power plants, hydraulic turbines, hydraulic power plant , fluctuating loads on power plants, economic analysis of power plants and tariffs.

#### Text Books

1. G. D. Rai, "Non Conventional Energy Sources", Standard Publishers Distributors.
2. R. K. Rajput, "Non Conventional Energy Sources and Utilisation", S. Chand Publications
3. Sukhatme, "Solar Energy: Principles of thermal collection and storage", TMH Publication

#### Reference Books

1. S. Rao, Dr B. B. Parulekar, "Energy Technology", Khanna Publishers.
2. G. N. Tiwari, R. K. Mishra, "Advanced Renewable Energy sources", RSC Publishing
3. Garg and Prakash, H. P. Garg, "Solar energy: Fundamentals and Applications", TMH Publication
4. Arora and Domkundwar, "Power Plant Engineering" DhanpatRai & Co. Publishing.

#### Mapping of Course outcome with Program Outcomes

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Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	1		1	2	1			
CO2	3	1	1	1	2	1				
CO3	3	2	2	1	1	2				
CO4	3	2	3		1	1				
CO5	3	2	1				1			
CO6	3	2	1							

**1 – High 2 – Medium 3 - Low**

**Teacher's Assessment:** Teachers Assessment of 10 marks is based on one of the / or combination of few of following

- 1) Question & answer / Numerical solution
- 2) Power point presentation of case studies of thermodynamic system
- 3) Test consisting of multiple choice questions

**Assessment Pattern**

Assessment Pattern Level No.	Knowledge Level	Test I	Test II	Teachers Assessment/ Assignment	End Semester Examination
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K2	Understand	04	04	02	10
K3	Apply	03	03	02	20
K4	Analyze	05	05	02	20
K5	Evaluate	00	00	02	00
K6	Create	00	00	00	00
Total Marks 100		15	15	10	60

**Assessment table**

Assessment Tool	K1	K2	K3	K4	K5
Cos	CO1	CO1/CO5	CO3	CO4/CO2	CO5
Class Test (15 Marks)	03	04	03	03	02
Class Test (15 Marks)	03	04	03	03	02
Teachers Assessment (10 Marks)	02	02	02	02	02
ESE Assessment (60 Marks)	12	05	10	15	18

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