



GOVERNMENT POLYTECHNIC KANDHAMAL, PHULBANI

LESSON PLAN: INDUSTRIAL ENGINEERING AND MANAGEMENT

Subject Name: (Programme Elective) Industrial Engineering and Management

Subject Code: MEPE301 (TH:3)

Semester: 5th, **Branch:** Mechanical Engineering

Academic Calendar: Winter 2026

Name of the Faculty: Dr Dillip Kumar Panigrahi, Lecturer in Mechanical, Govt. Polytechnic Kandhamal, Phulbani

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| L | T | P | Total Marks: 100 | Course Code: MEPE301 (A) |
| 3 | 0 | 3 | | Theory Assessment |
| Total Contact Hours | | | | End Term Exam: 70 |
| Theory: 45 Hrs | | | | Progressive Assessment: 30 |
| Pre-Requisite: Nil | | | | |
| Credit: 3 | | | | Category of Course: PE |

RATIONALE:

This course focuses on optimizing resource utilization and improving productivity through effective management of people, materials, and processes. It empowers students to analyze and eliminate waste, implement efficient methods, and make data-driven decisions to enhance overall organizational performance.



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LEARNING OUTCOMES:

After the completion of the course, the student shall be able to

- Explain the different types of lay out and plant maintenance with safety.
- List and explain the need for method study and work measurements.
- Describe production planning and quality control, and its functions.
- Define the principles of personnel management and organizational behavior.
- List and explain the different financial and material management.

| SI No. | Date | Topics to be Covered as per Lesson Plan | Points / Contents to be Discussed (in detail) |
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| 1 st Week | 01-07-2026 to 04-07-2026 | ➤ Plant Engineering (Unit-I) | <ul style="list-style-type: none">➤ Plant➤ Selection of site of industry➤ Plant layout➤ Principles of a good layout➤ Types; Process; Product and Fixed position➤ Techniques to improve Layout➤ Principles of Material handling equipment |
| 2 nd Week | 06-07-2026 to 10-07-2026 | <ul style="list-style-type: none">➤ Plant Engineering (Unit-I)➤ Plant Safety (Unit-I) | <ul style="list-style-type: none">➤ Plant maintenance➤ Importance➤ Break down maintenance; Preventive maintenance and Scheduled maintenance |
| 3 rd Week | 13-07-2026 to 18-07-2026 | ➤ Plant Safety (Unit-I) | <ul style="list-style-type: none">➤ Importance➤ Accident➤ Causes and Cost of an Accident➤ Accident Proneness➤ Prevention of Accidents➤ Industrial disputes➤ Settlement of Industrial disputes➤ Collective bargaining➤ Conciliation |



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| | | | <ul style="list-style-type: none"> ➤ Mediation ➤ Arbitration ➤ Indian Factories Act 1948 and its provisions related to health, welfare and safety |
| | 16-07-2026 | ➤ Rath Yatra | |
| 4 th Week | 20-07-2026 to 24-07-2026 | ➤ Work Study (Unit-II) | <ul style="list-style-type: none"> ➤ Productivity ➤ Standard of living ➤ Method of improving Productivity ➤ Objectives; Importance of good working conditions |
| 5 th Week | 27-07-2026 to 01-08-2026 | ➤ Method Study (Unit-II) | <ul style="list-style-type: none"> ➤ Definition ➤ Objectives ➤ Selection of a job for method study ➤ Basic procedure for conduct of Method study ➤ Tools used ➤ Operation process chart; Flow process chart; Two handed process chart; Man Machine chart ➤ String diagram and flow diagram |
| 6 th Week | 03-08-2026 to 07-08-2026 | ➤ Work Measurement (Unit-II) | <ul style="list-style-type: none"> ➤ Definition ➤ Basic procedure in making a time study ➤ Employees rating factor ➤ Application of time allowances: Rest, Personal, Process, Special and Policy allowances ➤ Calculation of standard time ➤ Numerical Problems |
| 7 th Week | 10-08-2026 to 15-08-2026 | ➤ Work Measurement (Unit-II) | <ul style="list-style-type: none"> ➤ Basic concept of production study ➤ Techniques of Work Measurement ➤ Ratio delay study ➤ Synthesis from standard data ➤ Analytical estimating and Predetermined Motion Time System (PMTS) |
| | 15-08-2026 | ➤ Independence Day | |



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| 8 th Week | 17-08-2026 to 21-08-2026 | ➤ Production Planning and Control (Unit-III) | <ul style="list-style-type: none"> ➤ Introduction ➤ Major functions of Production Planning and Control ➤ Preplanning ➤ Methods of forecasting ➤ Routing and Scheduling ➤ Dispatching and Controlling |
| 9 th Week | 24-08-2026 to 29-08-2026 | ➤ Production Planning and Control (Unit-III) | <ul style="list-style-type: none"> ➤ Concept of Critical Path Method (CPM) ➤ Types of Production: Mass Production, Batch Production and Job Order Production ➤ Characteristics ➤ Economic Batch Quantity (EBQ) ➤ Principles of Product and Process Planning ➤ Make or Buy decision ➤ Numerical problems |
| | 26-08-2026 | ➤ Birthday of Prophet Mohammad | |
| | 27-08-2026 | ➤ Jhulana Purnima | |
| 10 th Week | 31-08-2028 to 05-09-2026 | ➤ Quality Control (Unit-III) | <ul style="list-style-type: none"> ➤ Definition ➤ Objectives ➤ Types of Inspection: First piece, Floor and Centralized Inspection ➤ Advantages and Disadvantages ➤ Statistical Quality Control ➤ Types of Measurements ➤ Method of Variables ➤ Method of Attributes |
| | 04-09-2026 | ➤ Janmastami | |
| 11 th Week | 07-09-2029 to 11-09-2026 | ➤ Quality Control (Unit-III) | <ul style="list-style-type: none"> ➤ Uses of X, R, p and c charts ➤ Operating Characteristics curve (O.C curve) ➤ Sampling Inspection ➤ Single and Double Sampling plan ➤ Concept of ISO 9001:2008 Quality Management System ➤ Registration/Certification procedure |



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| | | | ➤ Benefits of ISO to the organization |
| 12 th Week | 14-09-2026 to 19-09-2026 | ➤ Principles of Management (Unit-IV) | <ul style="list-style-type: none"> ➤ Definition of Management ➤ Administration; Organization ➤ F.W. Taylor's and Henry Fayol's Principles of Management ➤ Functions of Manager ➤ Types of Organization: Line, Staff, Taylor's Pure functional types ➤ Line and staff and committee type ➤ Directing ➤ Leadership ➤ Styles of Leadership ➤ Qualities of a good leader |
| | 14-09-2026 | ➤ Ganesh Puja | |
| | 15-09-2026 | ➤ Nuakhai | |
| | 16-09-2026 | ➤ Day following Nuakhai | |
| | 21-09-2026 to 25-09-2026 | ➤ Principles of Management (Unit-IV) | <ul style="list-style-type: none"> ➤ Motivation ➤ Positive and Negative Motivation ➤ Modern Management Techniques ➤ Just In Time ➤ Total Quality Management (TQM) ➤ Quality circle ➤ Zero defect concept ➤ 5S Concept ➤ Management Information Systems |
| 13 th Week | 28-09-2026 to 03-10-2026 | ➤ Personnel Management (Unit-IV) | <ul style="list-style-type: none"> ➤ Responsibility of Human Resource Management ➤ Selection Procedure ➤ Training of Workers ➤ Apprentice Training ➤ On the Job training and Vestibule School Training |
| | 02-10-2026 | ➤ Gandhi Jayanti | |
| 14 th Week | 05-10-2026 to | ➤ Personnel Management (Unit-IV) | <ul style="list-style-type: none"> ➤ Job Evaluation and Merit Rating ➤ Objectives and Importance |



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| | 09-10-2026 | | <ul style="list-style-type: none"> ➤ Wages and Salary Administration ➤ Components of Wages ➤ Wage Fixation ➤ Type of Wage Payment: Halsey's 50% Plan, Rowan's Plan and Emerson's efficiency plan ➤ Numerical Problems |
| 15 th Week | 12-10-2026 to 17-10-2026 | ➤ Financial Management (Unit-V) | <ul style="list-style-type: none"> ➤ Fixed and Working Capital ➤ Resources of Capital ➤ Shares Preference and Equity Shares ➤ Debentures ➤ Type of debentures ➤ Public Deposits ➤ Factory Costing: Direct Cost; Indirect Cost ➤ Factory Overhead |
| | 17-10-2026 | ➤ Maha Saptami | |
| 16 th Week | 19-10-2026 to 23-10-2026 | ➤ Financial Management (Unit-V) | <ul style="list-style-type: none"> ➤ Selling Price of a product ➤ Profit ➤ Numerical Problems ➤ Depreciation ➤ Causes ➤ Methods: Straight line, sinking fund and percentage on Diminishing Value Method ➤ Numerical Problems |
| | 19-10-2026 | ➤ Maha Nabami | |
| | 20-10-2026 | ➤ Vijaya Dasami | |
| 17 th Week | 26-10-2026 to 31-10-2026 | ➤ Material Management (Unit-V) | <ul style="list-style-type: none"> ➤ Objectives of good stock control system ➤ ABC analysis of Inventory ➤ Procurement and Consumption cycle ➤ Minimum Stock ➤ Lead Time ➤ Reorder Level |



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| | | | <ul style="list-style-type: none">➤ Economic Order Quantity➤ problems➤ Supply Chain |
| 18 th Week | 02-11-2026 to 05-11-2026 | ➤ Revision | |
| | 05-11-2026 | ➤ Closing of Attendance | |

REFERENCES:

1. Industrial Engineering & Management, S.C. Sharma, Khanan Book Publishing Co (P) Ltd., New Delhi
2. Industrial Engineering and Management, O.P. Khanna, Revised Edition, Dhanpat Rai Publications (P) Ltd., New Delhi – 110002.
3. Management, Aglobalperspective, Heinz Wehrich, Harold Koontz, 10th Edition, McGraw Hill International Edition 1994.
4. Essentials of Management, 4th Edition, Joseph L.Massie, Prentice-Hall of India, New Delhi 2004.
5. Principles and Practices of Management, Premvir Kapoor, Khanna Publishing House, N. Delhi

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