



Mandsaur University, Mandsaur(M.P.)
Department of Mechanical Engineering

Syllabus of
Elective-I ,Product Life Cycle Management (MEC 431)
M. Tech. Industrial Engineering & Managment (Semester-III)
 W.e.f.(session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Elective I Product Life Cycle Management (MEC431)	30	60	-----	10	3	1	-	4	100

COURSE OUTCOMES:

1. Recognize the importance of Product Life Cycle Management
2. Realize potential for Collaborative Product Development and digital manufacturing in contemporary manufacturing applications
3. Exhibit competence to develop PLM strategy and conduct PLM assessment

Unit1:Introduction to Product Life Cycle Management (PLM)- Definition, PLM Lifecycle model, Need for PLM, Opportunities and benefits of PLM, Components and Phases of PLM, PLM feasibility study PLM Concepts, Processes and Workflow - Characteristics of PLM, Environment driving PLM,PLM Elements, Drivers of PLM, Conceptualization, Design, Development, Validation, Production, Support of PLM.

Unit2:Collaborative Product Development- Engineering vaulting, product reuse, smart parts, engineering change management, Bill of materials and process consistency, Digital mock-up and prototype development, design for environment, virtual testing and validation, marketing collateralDigital Manufacturing – PLM Digital manufacturing, benefits manufacturing, manufacturing the first-one, Ramp up, virtual learning curve, manufacturing the rest, production planning

Unit3:Developing a PLM strategy and conducting a PLM assessment- Strategy, Impact of strategy, implementing a PLM strategy, PLM initiatives to support corporate objectives. Infrastructure assessment, assessment of current systems and applications

References

1. Antti Saaksvuori, Anselmi Immonen, “ Product Lifecycle Management.
2. John Stark, “Product lifecycle management: 21st century paradigm for product realization.



Mandsaur University, Mandsaur(M.P.)

Department of Mechanical Engineering

Syllabus of

Elective-I ,Industrial Ergonomics (MEC 432)

M. Tech. Industrial Engineering & Managment (Semester-III)

W.e.f.(session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	ontinuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
<u>Elective-I</u> Industrial Ergonomics (MEC432)	30	60	----	10	3	1	--	4	100

Course objective: this course enables the conceptual understanding of workstation design principles related to human body coordination with machine systems.

UNIT 1: Introduction: Definition ,Importance and scope of ergonomics, principles of occupational ergonomics, Human Physical Characteristics, Ergonomics and Human Factors Engineering , Physiology of Work, Cognitive Psychology and Sensory Processes, Biomechanics and Engineering., human body : system of Bones, joint and Muscles, Muscular work, Combination of static and dynamic efforts, Nervous systems and control of movements, Working efficiency, optimal use of Muscular Power.

UNIT 2 : Engineering Anthropometry, Human Machine System, Machine and Tool Design, Design workplace to suit body size, workplace design and anthropometric data, angle of rotation of joints, standing workplaces, sedentary workplaces, comfortable head position and inclination of vision, seating at work, seat angles, ergonomic chair, VDT (Visual Display terminal) workstations, Design of VDT keyboards, ergonomic efforts to control limb disorders.

UNIT 3 : Physiological principles and heavy work, Metabolism, energy consumption at work, Basal Metabolism, Limits and norms of energy consumption, organization of heavy work, energy consumption vs body posture, Normal performance and rest pauses, energy consumption and heart rate, static work and heart rate, efficiency of dynamic work.

UNIT 4 : Man –Machine system : Definition , components, Visual perception, Visual Effects Of Line And Form, The mechanics of seeing-psychology of seeing general influences of line and form., Lighting and accommodation, illumination levels, Color Models RGB, CMY, HSV, Color and light, color and objects, Lighting for fine works and VDT offices, Sound Perception, Main functions of hearing, Display of information – Ergonomics applied to instrument design controls, control display relationship, Design principles for control panels.Effect of Noise and

vibration at work place, Physiological and psychological effects of noise, guidelines for design of indoor climate .

Reference Books

- 1.Human Factors in Engineering and Design By Sanders & McCormick (McGrowHill)
 - 2.Occupational Ergonomics Principles and Applications By Tayyari & Smith (Chapman & Hall)
 - 3.The Power of Ergonomics as a Competitive Strategy By Gross & Right (Productivity Press)
 - 4 Industrial Ergonomics by M.I. Khan (PHI Learning)
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Mandsaur University, Mandsaur(M.P.)

Department of Mechanical Engineering

Syllabus of

Elective-I, Industrial Organization and Management (MEC 433)

M. Tech. Industrial Engineering & Management (Semester-III)

W.e.f.(session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Industrial Organization and Management (MEC 433)	30	60	----	10	3	1	--	4	100

Course objective: The overall perspective of the syllabus of this subject is to develop an understanding of the industrial organizations and various aspects of organizational behavior and control.

Unit 1 Introduction: Definitions of management, Roles and Functions of a Manager, Schools of Management Thought, Comparison of American, Japanese and Indian Philosophies of Management, Importance and relation between planning and control, why planning is difficult, types of plans, Objectives of business, Decision-Making, Policy Formulation and administration and organization, management functions- planning, organizing, leading and controlling, organization performance, management skills, Mintzberg's three role-category of informational, interpersonal/ HRM and decisional, historical evolution of management thinking: classical, humanistic, modern perspectives, scientific, bureaucratic, administrative, human resources, behavior, system and contingency theories, learning organization, corporate cultures .

Unit 2 Organization: Nature and Purpose of Organizing, size ,complexity, centralization and formalization, Departmentation , Organization Structures, line, staff and matrix organizations, formal and informal organizations, Span of Control, Delegation of Authority , dimensions of organizations- size/specialization, behavior formalization and authority centralization, span and line of control, responsibility, authority(to use resources) and accountability, horizontal coordination by task force and project teams, Business Process Reengineering, strategy (stable/cost-leadership/efficiency, flexible/differentiation/innovative) and Technology **Planning:** Definition, why planning is necessary and difficult, mission, vision, goals, objectives, strategies, plans and schedules, three levels hierarchy of planning and goals, contingency plans, management by objectives (MBO), BCG matrix, SWOT analysis, Porters five factor competency.

Unit 3 Leading and decision making: Personnel Management , Manpower Planning, Selection and Recruitment, Methods & Types of Training, Motivation, Maslow's need hierarchy,

role of money, reduction in hierarchy levels, Herzberg hygienic and motivating factors, Leadership Theories, characteristic and styles of leaderships, Performance Appraisal decision making , six rational steps, personal differences/**styles**- directive, analytical, conceptual and types of decision- structured (programmed) and unstructured, decision under risk, uncertainty and ambiguity, models like Staffing: Functions of behavioral, Vroom-Jago's five leader/ group participation styles of decide, consult-individual/ group, facilitate, delegate and the model to decide the styles, management in crisis/ turbulence and change management.

Unit 4 Controlling: Meaning, Process and Evaluations, effectiveness and efficiency controls, feed forward (push) and feedback (pull) controls, Developing and compensating employees, Control Methods, Effective Communication. mutual relation in plan and control, control loop, administrative and financial controls, budgets, types of Ownership, Individual, Partnership: - Joint stock company, Public Ltd and Pvt. Ltd companies, cooperative organization, cooperative Societies, public sector organization, comparative evaluation of different forms of Business ownership.

Unit 5: System Concepts: Types, definition & characteristics; supra & sub systems, key component; boundary & interface complexity; feedback (pull) & feed forward (push) controls, open flexible-adaptive system, computer as closed system, law of requisite variety; system coupling ,stresses and entropy; functional & cross functional system; Steven Alter's nine element work system model and its comparison with IPO (input-processing-output) model, structure and performance of work systems leading to customer delight.

References:

- 1- Daft R, The new era of management;.
- 2- Bhat Anil, Arya kumar; Management: Principles, Processes Practices;
- 3- Robbins S P, Organization theory; PHI
- 4- Industrial organization & Management : O.P.Khanna
- 5- Agrawal RD, Principles of Organization.
- 6- Industrial organization & Management : S.C. Mahajan.

Course outcomes: An Understanding of the industrial organizational control and Management will be developed.



Mandsaur University, Mandsaur(M.P.)
Department of Mechanical Engineering
 Syllabus of
Production and operation Management (MEC441)
M. Tech. Industrial Engineering & Management (Semester-III)
 W.e.f.(session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Production and operation Management (MEC441)	30	60	-----	10	3	1	-	4	100

COURSE OUTCOMES

1. Understand the challenges and advancements of production and operation management techniques.
2. Execution of various phases of production systems.
3. Development of environmentally friendly production processes

Unit1: Introduction to Production Management: Introduction; History of Production and Operations Management; Definitions of Production Management; Production Process; Production: The Heart of an Organization; Objectives of Production Management; Scope of Production Management; Importance of Technology in Production

Unit2: Introduction to Operations Management: Definition of Operations Management: An Outline of Operations Strategy; Factors Affecting Operations Management; Objectives of Operations Management; Functions and Scope of Operations Management: Planning, Organizing, Controlling, Manufacturing and Non-Manufacturing Operations and their Classifications, Productivity Figure , Operations Planning and Control

Unit3: Operations Strategy: Meaning of Operations Strategy- Hierarchy and Flow; Current Global Business Conditions; Operations Strategy as a Competitive Weapon; Elements of Operations Strategy; Operations Strategy in Services, **Forecasting:** Concept of Forecasting: Purpose of Sales Forecasting, Basic Elements of Forecasting, Importance of Forecasting, Objectives of Forecasting, Classification of Forecasting ; Qualitative and Quantitative Techniques of Forecasting: Qualitative Techniques, Quantitative Techniques.

Unit4: Production and Process Design: Product Selection; Definitions of Product Design and Development: Need for Product Design and Development, Origin of the Product Idea and Selection from Various Alternatives, Choosing among Alternative Products, Modifying the Existing Products, Sources of Product Innovation, Characteristics of a Good Design, Reverse Engineering, Concurrent Engineering; Process Design—Meaning, Need, Factors and Types:

Framework for Process Design, Process Planning Procedure, Relationship between Process Planning and other POM Activities, Type of Process Designs.

Unit 5: Operations Technology: Importance of Operations Technology: Types of Operations Technology; Manufacturing Systems or Production Systems: Continuous Production System (CPS), Characteristics of Continuous Production System, Intermittent Production System; Automation: Meaning, Importance and Elements: Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), Flexible Manufacturing System (FMS), Computer-Integrated Manufacturing System (CIMS), Automatic Identification Systems (AIS); Enterprise Resource Planning (ERP): Need for Enterprise Resource Planning: Why ERP?

References

1. Hop W, Spearman M; Factory Physics; TMH
 2. Charry S.N.; Production & Operations Management; TMH.
 3. Chase, Acquilino, Production & Operations Management, TMH.
 4. Eilon S. Production Planning and Control, McMillon Pub.
 5. Vollmann; Mfg planning and control for SCM; TMH
 6. Nahmias Steven; Production and Operations analysis; TMH
 7. Bedi Kaniska; Production and Operations Management; Oxford Pub
 8. Dobler & Lee, Purchasing & Materials Management, PHI.
 9. Chitle A.K., Gupta R.C. Materials Management, PHI
 10. Production Management by Martand & Telsang.
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Mandsaur University, Mandsaur(M.P.)

Department of Mechanical Engineering

Syllabus of

Elective-II ,Research Methodology (MEC 442)

M. Tech. Industrial Engineering & Management (Semester-III)

W.e.f.(session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per			Credits	Total Marks
	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Research Methodology MEC-442	30	60	-----	10	3	1	-	4	100

COURSE OUTCOMES: Students will learn effective steps of quality research work.

Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process.

Problem Identification & Formulation – Research Question – Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance

Research Design: Concept and Importance in Research – Features of a good research design – Exploratory Research Design – concept, types and uses, Descriptive Research Designs – concept, types and uses. Experimental Design: Concept of Independent & Dependent variables.

Qualitative and Quantitative Research: Qualitative research – Quantitative research – Concept of measurement, causality, generalization, replication. Merging the two approaches.

Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling.

Data Analysis: Data Preparation – Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association.

Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish ? Ethical issues related to publishing, Plagiarism and Self-Plagiarism.

Use of Encyclopedias, Research Guides, Handbook etc., Academic Databases for Computer Science Discipline.

References:

1. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition

2. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.
3. Research Methodology – C.R.Kothari



Mandsaur University, Mandsaur(M.P.)

Department of Mechanical Engineering

Syllabus of

Elective-II ,Materials Management (MEC 443)

M.Tech (III-Semester) (CBCS Scheme)(02YDC)

w.e.f. (session2017-18)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Elective-II, Materials Management (MEC-443)	30	60	10	-	3	1	-	4	100

COURSE OUTCOMES:

The basic objective of this course is to provide to the country a steady stream of competent young men & women with the necessary knowledge, skills and foundations for acquiring a wide range of rewarding careers into the rapidly expanding world of Materials Management.

Unit 1:

PRINCIPLES AND PRACTICES OF MANAGEMENT:

Definitions of Management History of management Thought, Different approaches to management, Functions of Management, Strategies, policies, and planning premises, decision-making

Unit 2:

MATERIALS MANAGEMENT:

An overview, Objective, Importance Integrated approach to Materials Management, Factors affecting material planning, Techniques of material planning ,Purchasing, Procedure & Pricing Issues

Unit 3:

INVENTORY CONTROL TECHNIQUES AND PRINCIPLES:

Definition-Classification of Inventories- Need for inventories – Merits & Demerits of Inventories Inventory control techniques and principles classification, codification, standardization – ABC analysis –VED, GOLF, FSN –HML.

Unit 4 :

LOGISTICS MANAGEMENT: Introduction to logistics Management – Significance of logistics – The Total distribution concepts – Integrated Logistics. The Economics of Logistics Cost associated With Logistics Materials handling packaging and transportation systems.

Unit 5 :

PHYSICAL DISTRIBUTION & SUPPLY CHAIN MANAGEMENT:

Meaning, Scope & Importance of Physical Distribution Understanding The Supply Chain, Decision Phases in Supply Chain, Process View of Supply Chain.

Reference Books:

Principles and Practices of Management –L.M. Prasad.

Principles and practices of Management –Tripathi and Reddy.

Principles and Practices of Management –Dr. P. C. Shejwalkar.

Materials and logistics Management-Prof. Shailesh Kasande.

Materials and logistics Management-Dr. L. C. Jhamb.

Materials Management-Mr. K. K. Ahuja.

An integrated approach to Materials Management-Gopalkrishnan & Sundersan.