Gautam Buddha University, Greater Noida

School of Engineering (Mechanical Engineering)- MEI 601

Degree	Course Name	Course Code	Marks:100
M. Tech. Ind. Engg. & Management	Project Management	MEI 601	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
III	3	3-0-0	3 Hours

Unit - I

Introduction: Concept of a project; Types of project; Taxonomy of projects; Project identification and formulation project life cycle phase; Project development; Project identification and selection; Feasibility study. **(07 Hours)**

Unit - II

Project Planning: Work Breakdown structure; Project execution planning; Contract planning; Selection of project organization structure; Project contracts; Types of contracts; Types of payments to contractors. **(08 Hours)**

Unit - III

Project Appraisal & Cost Estimation: Introduction; Technical appraisal; Commercial appraisal; Economic appraisal; Financial appraisal; Management appraisal; Social cost/benefit analysis; Project risk analysis; Cost analysis of the project; Components of capital cost of a project; Modern approach to project performance analysis. **(08 Hours)**

Unit - IV

Project Scheduling: Gantt Charts; Introduction to PERT & CPM; Planning and scheduling networks; Time estimation; Determination of critical path; CPM model; Event slacks & floats; PERT model; Expected time for activities; Expected length of critical path; Calculating the project length and variance; PERT & CPM cost accounting systems; Lowest cost schedule; Crashing of networks; Linear programming formulation of event oriented networks; Updating of networks.

(08 Hours)

Unit – V

Project Monitoring and Control: Line of balanced and pace (performance and cost evaluation) techniques; Project control process; Performance analysis; Internal and external project control; Approaches to project control; Control problems. **(07 Hours)**

Unit – VI

Human Aspects of Project Management: Leadership in project management; The role of project manager; Project team; Motivation and group cohesiveness.

(07 Hours)

Recommended Books:

1. Project Management; S. Choudhary; Tata McGraw Hill.
2. Managing Business and Engineering Projects; Nicholas; Prentice Hall.
3. Project Preparation; Appraisal; Budgeting and Implementation; Prasanna Chandra; Tata McGraw Hill.

School of Engineering (Mechanical Engineering)- MEI 603

Degree	Course Name	Course Code	Marks:100
M. Tech. Ind. Engg. & Management	Reliability Engineering	MEI 603	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
III	3	3-0-0	3 Hours

Unit - I

Introduction to Reliability Engineering: Definition of reliability; Types of failures; Definition and factors influencing system effectiveness; Various parameters of system effectiveness. **(05 Hours)**

Unit - II

Reliability Data Analysis: Definition of probability; Laws of probability; Conditional probability; Bayes theorem; Probability distributions- Exponential; Weibull; Normal and Gamma; Data collection; Recovery of data; Data analysis Procedures; Empirical reliability calculations; Goodness of fit tests; Survival graphs. **(09 Hours)**

Unit - III

Reliability Modeling: Types of system- Series; Parallel; Series - parallel; Stand by and complex; Development of logic diagram; Methods of reliability evaluation; cut set and tieset methods; Matrix methods event trees and fault trees methods; Reliability evaluation using probability distributions; Markov method; Frequency and duration method. **(09 Hours)**

Unit – IV

Reliability Testing: Failure terminated test; Time terminated test; Upper and lower MTBFs; Sequential testing; Reliability growth monitoring; Life testing-requirements; Methods; test planning; Data reporting system; Data reduction and analysis; Reliability test standards. **(08 Hours)**

Unit – V

Reliability Improvement: Methods of reliability improvement; Component redundancy; System redundancy; Types of redundancies-Series; Parallel; Series - parallel; Stand by and hybrid. **(07 Hours)**

Unit – VI

Reliability Replacement Decisions: Effect of maintenance; Analysis of downtime – Repair time distribution; System repair time; Maintainability prediction; Measures of maintainability; System availability; Replacement decisions. **(07 Hours)**

Recommended Books:

1. Reliability in Engineering and Design; K. C. Kapoor & L. R. Lamberson; John Wiley and Sons.
2. An introduction to Reliability and Maintainability Engineering; Charles E. Ebeling; Tata McGraw Hill.
3. Reliability Evaluation of Engineering Systems; Roy Billington and Ronald N. Allan; Springer.

School of Engineering (Mechanical Engineering)- MEI 605

Degree	Course Name	Course Code	Marks:100
M. Tech. Ind. Engg. & Management	Procurement & Material Mgmt.	MEI 605	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
III	3	3-0-0	3 Hours

Unit - I

Introduction: Functions of materials management; Concept of integrated material management; Relationship of material management with other organizational functions. **(06 Hours)**

Unit – II

Material Planning: Need for material planning; Factors affecting material planning; Techniques of material planning; Material classification; Codification and standardization; Kanban; Theory of constraints. **(08 Hours)**

Unit – III

Material Budgeting: Fundamentals of forecasting techniques; Material budgeting - meaning and need; Techniques of material budgeting. **(07 Hours)**

Unit – IV

Purchasing: Need and meaning of inventory; Types of inventory; Functions of inventory control; Inventory costs; Inventory control tool - ABC; VED; Economic order quantity / Economic production quantity and replenishment of stocks.

(08 Hours)

Unit – V

Inventory Control: Fixed order; Two bin - Material requirement planning (MRP-I); Spare parts control for maintenance purposes; Evaluation of inventory control performance. Concept of just-in-time (JIT); Use of computers for inventory control; Order preparation. **(08 Hours)**

Unit - VI

Storage: Functions and importance of store keeping; Types of stores; Store accounting and store verification; Legal aspects of store keeping; Management of surplus; Scrap and obsolete items; Importance of material handling in store keeping; Handling equipments; Automated storage and retrieval systems.

(08 Hours)

Recommended Books:

1. Material Management; M. M. Verma; S. Chand & Sons.
2. Purchasing and Materials Management; Dobbler and Burt; Tata McGraw Hill.
3. Material Management – An Integrated Approach; Gopal Krishnan and Sudarshan; Prentice Hall of India.

School of Engineering (Mechanical Engineering)- MEI 607

Degree	Course Name	Course Code	Marks:100
M. Tech. Ind. Engg. & Management	Logistic Management	MEI 607	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
III	3	3-0-0	3 Hours

Unit - I

Introduction to Logistics Management: Mission of logistics; Logistical activities; Integrated logistics; Operating objectives of logistics; Logistical performance cycles; Structure of marketing channels; Marketing channel relationships; Economics of distribution. **(08 Hours)**

Unit - II

Logistical Resources: Transportation infrastructure: Transportation functionality and principles; Modal characteristics; Modal classification; transportation formats; Suppliers of transportation services.

Transportation management; Basic transport economics and pricing; Transport documentation. **(08 Hours)**

Unit - III

Information: Information functionality and principles; Information architecture; Applications of new information technologies

Warehouse management; Storage functionality and principles; Developing the warehouse resource. **(07 Hours)**

Unit - IV

Logistics System Design: Logistics location structure; Warehouse location patterns; Transportation economies; Inventory economies; Formulating logistical strategy.

Planning and design methodology; Problem definition and planning; Data collection and analysis; Recommendations and implementation. **(07 Hours)**

Unit - V

Logistics Administration: Organization; Stages of functional aggregation; Issues and challenges; Management of alliances.

Planning; Costing and pricing; Operations and planning; Logistical design metrics; Pricing. **(08 Hours)**

Unit - VI

Performance Measurement and Reporting: Logistical measurement; Characteristics of an ideal measurement system; Levels of measurement and information flow; Report structures. **(07 Hours)**

Recommended Books:

1. Logistical Management; Donald J. Bowersox and David J. Closs; Tata McGraw Hill.
2. Logistics and Supply Chain Management; Martin Christopher; Financial Times Series.
3. Logistics and Supply Chain Management; Raghuram and Rangaraj; Macmillan.

School of Engineering (Mechanical Engineering) – MEI 609

Degree	Course Name	Course Code	Marks:100
M. Tech.	Product Design & Development	MEM 609	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
III	3	3-0-0	3 Hours

Unit - I

Introduction to Product Design: Introduction to PDD; Applications; Relevance; Scope; Terminology; Design definitions; the role and nature of design; Old and new design methods; Design by evolution; Product development process; Product development organizations; Identifying the customer needs; Establishing the product specifications; Concept generation; Concept selection.

(08 Hours)

Unit - II

Product Architecture: Product architecture; Implication of the architecture; Establishing the architecture; Related system level design issues.

(06 Hours)

Unit - III

Industrial and Manufacturing Design: Need for industrial design; Impact of industrial design; Industrial design process; Assessing the quality of industrial design; Human Engineering consideration. **(08 Hours)**

Unit - IV

Prototyping and Economic Analysis: Principles of prototyping; Planning for prototypes; Elements of economic analysis; Base case financial model; Sensitivity analysis; Influence of the quantitative factors. **(08 Hours)**

Unit - V

Product Appraisal: Information and literature search; Patents; standards and codes; Environment and safety considerations; Existing techniques such as work-study; SQC etc. which could be used to improve method & quality of product; Innovation versus invention; Technological forecasting. **(08 Hours)**

Unit - VI

Product Development Projects: Sequential; parallel and coupled tasks; Baseline project planning; Project budget; Project execution; Project evaluation.

(07 Hours)

Recommended Books:

1. Product Design and Development; Karal .T. Ulrich; Steven D. Eppinger; McGraw Hill.
2. Product Design & Manufacturing; A. K. Chitab & R. C. Gupta; PHI (EEE).
3. The Technology of Creation Thinking; R. P. Crewford – Prentice Hall.

School of Engineering (Mechanical Engg)- MEI 611/MEI 602

Degree	Course Name	Course Code	Marks:100
M. Tech. Ind. Engg. & Management	Dissertation (Preliminary) / Dissertation	MEI 611 / MEI 602	SM+EM 50+50
Semester	**Credits**	**L-T-P**	**Exam.**
III/ IV	4 / 21	0-0-4/0-0-21	

Course Background

The students are required to undertake Analytical/Experimental investigations in fields of their specialization. They would be working under the supervision of one/two faculty member(s). The investigation they undertake should be innovative to the level of PG study and outcome of their research should be a meaningful addition to the existing knowledge and technology. Entire research work has been divided in two semesters namely dissertation (preliminary) and dissertation.

Objectives of Dissertation (Preliminary):

- To identify the area of research;

- To perform detail literature survey on the topic;
- To identify gaps in the research;
- To identify particular problems of investigation;
- To identify hardware/software required to carry out research;

Objectives of Dissertation:

- To carry out research in a planned manner;
- Finally to submit complete report of the research work in prescribed format.

Evaluation Scheme (Dissertation Preliminary):

SM

Final report	:	10 Marks
Presentation	:	20 Marks
Peer review/ Viva voce	:	20 Marks

The evaluation will be done by a committee consisting of the following:

1) Chairperson/ HoD/ Programme coordinator or his/ her nominee;
2) Supervisor of the candidate;
3) Project faculty coordinator;
4) Any other faculty member appointed by Dean, SoE, if any.

EM:

Final report	:	10 Marks
Presentation	:	20 Marks
Peer review/ Viva voce	:	20 Marks

The evaluation will be done by a committee consisting of the following:

1) Chairperson/ HoD/ Programme coordinator or his/ her nominee;
2) Supervisor of the candidate;
3) Project faculty coordinator;
4) Any other faculty member appointed by Dean, SoE, if any.

Evaluation Scheme (Dissertation):

SM

Final report	:	10 Marks
Presentation	:	20 Marks
Peer review/ Viva voce	:	20 Marks

The evaluation will be done by a committee consisting of the following:

1) Chairperson/ HoD/ Programme coordinator or his/ her nominee;
2) Supervisor of the candidate;
3) Project faculty coordinator;
4) Any other faculty member appointed by Dean, SoE, if any.

EM:

Final report	:	10 Marks
Presentation	:	20 Marks
Peer review/ Viva voce	:	20 Marks

The evaluation will be done by a committee consisting of the following:

1) Chairperson/ HoD/ Programme coordinator or his/ her nominee;
2) External examiner;