

1. With respect to the feedback given by Mr.A.L. Ashok, Manager,MRF Ltd about ERP implementation, Enterprise Resource Planning subject is added in R2019.

IE5072

ENTERPRISE RESOURCE PLANNING

L T P C
3 0 0 3

COURSE OBJECTIVES:

- Describe an idea about ERP.
- Grasp the activities of ERP project management cycle.
- Understanding the emerging trends in ERP developments.
- Creating awareness of core and extended modules of ERP.
- Understand the ERP trending concepts.

UNIT I INTRODUCTION 9

Overview of enterprise systems – Evolution - Risks and benefits - Fundamental technology - Issues to be consider in planning design and implementation of cross functional integrated ERP systems.

UNIT II ERP SOLUTIONS AND FUNCTIONAL MODULES 9

Overview of ERP software solutions- Small, medium and large enterprise vendor solutions, BPR, and best business practices - Business process Management, Functional modules.

UNIT III ERP IMPLEMENTATION 9

Planning Evaluation and selection of ERP systems - Implementation life cycle - ERP implementation, Methodology and Frame work- Training – Data Migration. People Organization in implementation-Consultants, Vendors and Employees.

UNIT IV POST IMPLEMENTATION 9

Maintenance of ERP- Organizational and Industrial impact; Success and Failure factors of ERP Implementation.

UNIT V EMERGING TRENDS ON ERP 9

Extended ERP systems and ERP add-ons -CRM, SCM, Business analytics - Future trends in ERP systems-web enabled, Wireless technologies, cloud computing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- CO1: Knowledge of ERP implementation cycle.
 CO2: Awareness of core and extended modules of ERP.
 CO3: Able to understand ERP implementation steps.
 CO4: Able to understand post implementation procedure.
 CO5: Able to understand ERP trending concepts.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓				✓					✓	
CO2		✓				✓					✓	
CO3	✓	✓				✓					✓	
CO4		✓				✓					✓	
CO5	✓	✓				✓					✓	

TEXT BOOK:

1. Alexis Leon, ERP demystified, second Edition Tata McGraw-Hill, 2008.

REFERENCES:

1. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
2. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008.
3. MahadeoJaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009.
4. Sinha P. Magal and Jeffery Word, Essentials of Business Process and Information System, Wiley India, 2012.
5. Summer, ERP, Pearson Education, 2008.
6. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2006.

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2. With respect to the feedback given by Mr.A.L. Ashok, Manager,MRF Ltd about Engineering Economics, content of Engineering Economics subject is changed in R2019.It was offered as Engineering economics and costing in R2015.R2015 syllabus is enclosed for reference.

R2019 Course Content

IE5301

ENGINEERING ECONOMICS

L T P C
3 0 0 3

COURSE OBJECTIVES:

- Understanding the concept of Engineering Economics.
- Implement various micro economics concept in real life.
- Gaining knowledge in the field of macro economics to enable the students to have better understanding of various components of macro economics.
- Understanding the different procedures of pricing.
- Learn the various cost related concepts in micro economics.

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS 9

Definition of Managerial Economics - Nature and scope of Managerial Economics - Managerial Economics and other disciplines. Objectives of the firm - Factors influencing Managerial decisions, Demand Analysis – Defining demand, Types of demand and Determinants of demand, Elasticity of Demand and Supply.

UNIT II PRODUCTION AND COST ANALYSIS 9

Production Analysis – Production function, Returns to a factor, Returns to scale, ISO quants and least cost combination of inputs. Cost Analysis – Cost concepts, Determinants of cost, Short-run cost-output Relationship, Long-run cost output relationship, Economies and Diseconomies of scale and Estimating cost-Output Relationship.

UNIT III PRICING 9

Determinants of Price – Pricing under different objectives – Pricing under different market structures – Price discrimination – Pricing of Joint products – Pricing methods in practice.

UNIT IV MACRO ECONOMICS – I 9

National Income – Definition and Measurement – GDP, GNP, NDP, Personal Income – Business Cycles – Two and Four phases – Inflation – Causes and Effects of Inflation.

UNIT V MACRO ECONOMICS - II 9

MRTTP – FERA – International Trade – Balance of Trade – Balance of payments – Terms of Trade – Fiscal Policy – Foreign Exchange.

TOTAL: 45 PERIODS


COURSE OUTCOMES:

- CO1:** Students will become familiar with principles of micro economics and demand forecasting.
- CO2:** Good understanding and knowledge in production and detailed cost analysis.
- CO3:** The principles of pricing methodologies are familiarized.
- CO4:** Macro Economics of various parameters of Gross National Product.
- CO5:** Awareness in business dynamics in macro economics.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓								✓		
CO2		✓										
CO3		✓										
CO4	✓	✓	✓		✓							
CO5	✓	✓	✓		✓							

TEXT BOOKS:

1. Nag A, "Macro Economics for Management Students" MacMillan India Ltd., New Delhi, 2005.
2. Yogesh Maheshwari, "Managerial Economics", Third edition, PHI 2012.


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R2015 Course Content

IL7076

ENGINEERING ECONOMICS AND COSTING

L T P C
3 0 0 3

OBJECTIVES :

- To study and understand the concept of Engineering Economics and apply in the real word.
- To gain knowledge in the field of cost estimation to enable the students to estimate the cost of various manufacturing processes.

UNIT I DEMAND ANALYSIS AND FORECASTING 10
Managerial Economics – Meaning, Nature and Scope – Managerial Economics and Business decision making – Role of Managerial Economist – Demand Analysis – Fundamental Concepts of Managerial Economics – Meaning, Determinants and Types of Demand – Elasticity of demand – Demand forecasting and forecasting methods.

UNIT II PRODUCTION FUNCTION AND COST ANALYSIS 9
Supply: Meaning and determinants – production function- Isoquants – Expansion path Cobb Douglas function – Cost concepts – Cost output relationship – Economies and diseconomies of scale – Cost functions- Determination of cost- Estimation of cost.

UNIT III MARKET COMPETITION AND PRICING 9
Market Structure – Various forms – Equilibrium of a firm – Perfect competition – Monopolistic competition – Oligopolistic competition – Pricing of products under different market structures – Methods of pricing – Factors affecting pricing decision – Differential pricing – Government Intervention and pricing.

UNIT IV PROFIT ANALYSIS 7
The concept of profit: Profit planning, control and measurement of profits. Profit maximisation – Cost volume profit analysis – Investment Analysis.

UNIT V COSTING 10
Job costing-Process costing-Operating costing-Standard Costing (variance analysis) and budgeting-
TOTAL: 45 PERIODS


OUTCOMES:

- Students will become familiar with principles of micro economics and cost estimation.
- They will be able to apply these principles to appreciate the functioning of product and input market as well as the economy.

REFERENCES:

1. A. Ramachandra Aryasry and V.V. Ramana Murthy. " Engineering Economics and Financial Accounting", Tata Mc graw Hill Publishing Company Ltd., New Delhgi, 2004

2. V.L. Mote, Samuel and G.S.Gupta, "Managerial Economics – Concepts and cases", Tata McGraw Hill Publishing Coimpany Ltd, New Delhi, 1981.
3. A.Nag, "Macro Economics for Management Students" MacMillan India Ltd., New Delhi, 1999.
4. Jawaharial, Cost Accounting, Tata McGraw Hill,



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3. With respect to the feedback given by Mr.A.L. Ashok, Manager,MRF Ltd about Ergonomics and healthcare, Course content is changed in R2019. R2015 syllabus is enclosed for reference.

R2019 Course Content

IE5701

APPLIED ERGONOMICS

L T P C
3 0 0 3

COURSE OBJECTIVES:

- Explain the knowledge of basic human science and Engineering science .
- Teach skills associated with ergonomic measurement methods and analytical techniques to workplace ergonomic problems.
- Plan and conduct an ergonomic analysis and ergonomic recommendations for modern work environment problems .
- Use the occupational health and safety rules to improve the work place.
- Teach and apply ergonomic principles to design workplaces for the improvement of human performance.

UNIT I INTRODUCTION 9

Brief history of human factors Engineering/Ergonomics – Interdisciplinary nature- Human-machine systems -Ergonomics and its areas of application in the work system - Future directions for ergonomics- Biostatic and Biodynamic Mechanics

UNIT II WORK PLACE DESIGN 9

Problems of body size- Anthropometry measures- Work posture– Design for standing and seated workers - Design of repetitive tasks - Design of manual handling tasks- VDT work stations – Hand tool design

UNIT III PHYSIOLOGICAL ASPECTS OF HUMAN AT WORK 9

Stress and fatigue -Physical work capacity - Physiological factors affecting work capacity –Fitness for work –Working hours and shift work- Quantitative work load analysis – Psychological work Demands.

UNIT IV DESIGN OF ENVIRONMENT 9

Design and Assessment in Hot, cold workplaces and the design of the physical environment– Noise and vibration- Vision –Human errors and Accidents – OSHA: Ergonomics Safety and Health Management rules – Personal Protective Equipments.

UNIT V HUMAN PERFORMANCE 9

Human Information receiving and processing – Information theory and its application – Cognitive systems - Mental Work Load -Signal detection theory – Design of Displays and controls

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- CO1: Ability to apply Knowledge of basic human science and Engineering science .
- CO2: Ability to Apply skills associated with ergonomic measurement methods and analytical techniques to workplace ergonomic problems.
- CO3: Ability to conduct an ergonomic analysis and ergonomic recommendations for modern work environment problems.
- CO4: Ability to implement the occupational health and safety rules to improve the work place.
- CO5: Ability to apply ergonomic principles to design workplaces for the improvement of human performance.


	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓											
CO2		✓	✓									
CO3			✓	✓								
CO4				✓	✓							
CO5				✓								

TEXT BOOKS:

1. Bridger, R. S."Introduction to Ergonomics", 3rd ed. CRC Press, New York and London,2008
2. Martin Helander, "A guide to Ergonomics of Manufacturing", TMH, 2006.

REFERENCES:

1. Philips, Chandler A. "Human Factors Engineering", John Wiley and Sons, Inc. 2000
2. Sanders, M.M. & McCormick, E.J. "Human Factors in Engineering & Design "7th ed., McGraw-Hill, NY,1993


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R2015 Course Content

IE7601

APPLIED ERGONOMICS

L T P C
3 0 0 3

OBJECTIVE:

- To explain the general principles that govern the interaction of humans and their working environment for improving worker performance and safety.

UNIT I INTRODUCTION 9

Brief history of human factors Engineering/Ergonomics – Interdisciplinary nature- Principles of Human factors Engineering- Biostatic and Biodynamic Mechanics.

UNIT II HUMAN PERFORMANCE 9

Factors influencing performance – Information receiving and processing – Information theory and its application – Human response and errors – Signal detection theory.

UNIT III PHYSIOLOGICAL ASPECTS OF HUMAN AT WORK 9

Metabolism – Physiological factors involved in muscular activity – Measurement of energy expenditure – Quantitative work load analysis – Physical work capacity and its evaluation – Physiological fatigue – Work and rest schedules – Physical fitness tests.

UNIT IV WORK PLACE DESIGN 9

Problems of body size, Anthropometry measures, Work posture – Work space layout and work station design – Design of displays, controls and VDT work stations – Hand tool design, illumination.

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UNIT V OCCUPATIONAL HEALTH AND SAFETY 9

Industrial accidents, Personnel Protective devices, Safety Management practices – Effect of Environment – heat, cold & noise – NIOSH regulations and Factories Act

TOTAL: 45 PERIODS

OUTCOMES:

The Student should be able

- CO1: To apply Knowledge of basic human science and Engineering science
- CO2: To apply ergonomic principles to design workplaces for the improvement of human performance
- CO3: To conduct an ergonomic analysis and ergonomic recommendations for a modern work environment problems
- CO4: Apply skills associated with ergonomic measurement methods and analytical techniques to workplace ergonomic problems.
- CO5: To implement latest occupational health and safety to improve the work place.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓											
CO2		✓										
CO3			✓									
CO4				✓								
CO5					✓							

TEXT BOOKS:

1. Bridger, R.S., "Introduction to Ergonomics", McGraw Hill, 1995.
2. Martin Helander, "A guide to Ergonomics of Manufacturing", TMH, 2006

REFERENCES:

1. McCormik, T.J., "Human Factors Engineering", TMH, 1990.
2. John Grimaldi "Safety Management" A I R S 5th Edition Hazard Control

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4. With respect to the feedback given by Mr.A.L. Ashok, Manager,MRF Ltd about Lean, Lean six sigma subject is added in R2019.

IE5073

LEAN SIX SIGMA

L T P C
3 0 0 3

COURSE OBJECTIVES:

- Explain the basics of Lean and Six Sigma.
- Teach the need and the process of integrating Lean and Six sigma.
- Summarize to identify and select the resources required for LSS Projects and selection of projects including Team building.
- Teach the DMAIC process and study the various tools for undertaking LSS projects.
- Illustrate to institutionalize the LSS efforts.

UNIT I INTRODUCTION TO LEAN AND SIX SIGMA

9

Introduction to Lean- Definition, Purpose, Features of Lean ; Top seven wastes, Need for Lean management, The philosophy of lean management, Creating a lean enterprise, Elements of Lean, Lean principles, the lean metric, Hidden time traps. Introduction to quality, Definition of six sigma, origin of six sigma, Six sigma concept and Critical success factors for six sigma.

UNIT II INTEGRATION OF LEAN AND SIX SIGMA

9

Evolution of lean six sigma, the synergy of Lean and six sigma, Definition of lean six sigma, the principles of lean six sigma, Scope for lean six sigma, Features of lean six sigma. The laws of lean six sigma, Key elements of LSS, the LSS model and the benefits of lean six sigma. Initiation - Top management commitment - Infrastructure and deployment planning, Process focus, organizational structures, Measures - Rewards and recognition, Infrastructure tools, structure of transforming event and Launch preparation.

UNIT III PROJECT SELECTION AND TEAM BUILDING

9

Resource and project selection, Selection of Black belts, Training of Black belts and Champions, Identification of potential projects, top down (Balanced score card) and Bottom up approach - Methods of selecting projects - Benefit/Effort graph, Process mapping, value stream mapping, Predicting and improving team performance, Nine team roles and Team leadership.

UNIT IV THE DMAIC PROCESS AND TOOLS

9

The DMAIC process - Toll gate reviews; The DMAIC tools; Define tools - Project definition form, SIPOC diagram; Measure tools - Process mapping, Lead time/cycle time, Cause and Effect matrix, Idea - generating and organizing tools - Brainstorming, Nominal group technique and Multi-voting; Data collection and accuracy tools- Check sheet, Gauge R&R; Understanding and eliminating variation- run charts; Analyze tools - Scatter plots, ANOVA, Regression analysis, Time trap analysis; Improve tools - Mistake proofing, Set up time reduction (SMED) and the pull system; Control tools - statistical process control.

UNIT V INSTITUTIONALIZING AND DESIGN FOR LSS

9

Institutionalizing lean six sigma - improving design velocity, creating cycle time base line, valuing projects, gating the projects, reducing product line complexity, Design for lean six sigma, QFD, Theory of Inventive Problem solving (TRIZ), Robust design; Case study presentations.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- CO1: The students will be able to understand what is Lean and Six sigma and their importance in the globalized competitive world.
- CO2: The students will be able to understand the importance of integrating Lean and Six sigma and also the process of their integration.
- CO3: The students will be able to plan the Resources required to undertake the LSS projects and also acquire how to select the suitable projects and the teams.
- CO4: The students will be able apply DMAIC methodology to execute LSS projects and in this regard they will be acquainted with various LSS tools.
- Co5: The students will be able to understand the process of institutionalizing the LSS effort and also understand the Design for LSS.

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