

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

Minor - INDUSTRIAL ENGINEERING - Offered by MECH Department

S.No	Course Code	Course Title	Scheme of Instructions Hours per Week				Scheme of Examination Maximum Marks		
			L	T	P	C	I	E	Total
1	23MRIEM1	Production Planning & Control	3	-	-	3	30	70	100
2	23MRIEM2	Marketing Management	3	-	-	3	30	70	100
3	23MRIEM3	Supply Chain Management	3	-	-	3	30	70	100
4	23MRIEM4	Strategic Management for Competitive	3	-	-	3	30	70	100
5	23MRIEM5	Six Sigma & Lean Manufacturing	3	-	-	3	30	70	100
6	23MRIEM6	Applied Project Work	-	-	6	1.5	30	70	100

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

Mechanical Department
Minor- INDUSTRIAL ENGINEERING
XXXXX

23MRIEM1	PRODUCTION PLANNING & CONTROL	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE EDUCATIONAL OBJECTIVES:

1. Understand the various components and functions of production planning and control
2. Explain the importance of Work study.
3. Familiarize with the terminology of product planning, process planning
4. Impart knowledge On Production Scheduling Policies and its Types.
5. Teach the recent trends like manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP). .

UNIT –1: Introduction

(9)

Objectives and benefits of planning and Control-Functions of production Control-Types of production- job- batch and continuous-Product development and design-Marketing aspect - Functional aspects- Operational Aspect-Durability and dependability aspect aesthetic aspect. Profit consideration- Standardization, Simplification & specialization- Break even analysis-Economics of a new design.

UNIT –2: Work Study

(9)

Method study, basic procedure-Selection-Recording of process - Critical analysis, Development - Implementation - Micro motion and memo motion study - work measurement - Techniques of work measurement - Time study - Production study - Work sampling - Synthesis from standard data - Predetermined motion time standards.

UNIT –3: Product Planning And Process Planning

(9)

Product planning-Extending the original product information-Value Analysis-Problems in lack of product planning-Process planning and routing-Pre requisite information needed for process planning- Steps in process planning-Quantity determination in batch production- Machine capacity, balancing- Analysis of process capabilities in a multi-product system

UNIT –4: Production Scheduling

(9)

Production Control Systems-Loading and scheduling-Master Scheduling-Scheduling rules-Gantt charts-Perpetual loading-Basic scheduling problems - Line of balance - Flow production scheduling- Batch production scheduling-Product sequencing - Production Control systems- Periodic batch control-Material requirement planning kanban - Dispatching-Progress reporting and expediting- Manufacturing lead time-Techniques for aligning completion times and due dates.

UNIT –5: Inventory Control And Recent Trends In PPC

(9)

Inventory control-Purpose of holding stock-Effect of demand on inventories-Ordering procedures. Two bin system - Ordering cycle system-Determination of Economic order quantity and economic lot size- ABC analysis - Recorder Procedure-Introduction to computer integrated production planning systems- elements of Just in Time Systems-Fundamentals of MRP II and ERP.

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		Pos
CO1	Students can able to prepare production planning and control activities.	L2
CO2	Understand the concepts of Work study.	L1, L2
CO3	Analyse the Pre requisite information needed for process planning	L2, L3
CO4	Understand the Scheduling techniques.	L1, L2
CO5	Students can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP).	L3, L4

TEXT BOOKS:

1. James. B. Dilworth, "Operations management – Design, Planning and Control for manufacturing and services" McGraw Hill International edition 1992.
2. Mart and Telsang, "Industrial Engineering and Production Management", First edition, S. Chand and Company, 2000.

REFERENCE BOOKS:

1. Chary. S.N., "Theory and Problems in Production & Operations Management", Tata McGraw Hill, 1995.
2. . Elwood S. Buffa, and Rakesh K. Sarin, "Modern Production / Operations Management", 8th Edition John Wiley and Sons, 2000.
3. Jain. K.C. & Aggarwal. L.N., "Production Planning Control and Industrial Management", Khanna Publishers, 1990.
4. Kanishka Bedi, "Production and Operations management", 2nd Edition, Oxford university press, 2007.
5. Melynk, Denzler, "Operations management – A value driven approach" Irwin McGraw hill.

REFERENCE WEBSITE:

<https://www.youtube.com/watch?v=yYIVumq6sVM>
<https://nptel.ac.in/courses/110107141>
<https://nptel.ac.in/courses/112107143>
<https://www.youtube.com/watch?v=Q7KpUY8spmM>

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

23MRIEM2	MARKETING MANAGEMENT	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE EDUCATIONAL OBJECTIVES:

- Developing and understanding of ideas and nuances of modern marketing.
- Describe the process to formulate and manage the B2B marketing strategy including all key components.
- Explain the techniques to conduct market analysis practices including market segmentation and targeting.
- Compare and contrast different perspectives that characterize the study of consumer behavior.
- Explain the role of IMC in the overall marketing program

UNIT -1: INTRODUCTION

(9)

Marketing – Definitions - Conceptual frame work – Marketing environment: Internal and External - Marketing interface with other functional areas – Production, Finance, Human Relations Management, Information System. Marketing in global environment – Prospects and Challenges.

UNIT -2: Marketing Strategy

(9)

Marketing strategy formulations – Key Drivers of Marketing Strategies - Strategies for Industrial Marketing – Consumer Marketing -- Services marketing – Competitor analysis - Analysis of consumer and industrial markets – Strategic Marketing Mix components.

UNIT -3: Marketing Mix Decisions

(9)

Product planning and development – Product life cycle – New product Development and Management – Market Segmentation – Targeting and Positioning – Channel Management – Advertising and sales promotions – Pricing Objectives, Policies and methods.

UNIT -4: Buyer Behaviour

(9)

Understanding industrial and individual buyer behaviour - Influencing factors – Buyer Behaviour Models – Online buyer behaviour - Building and measuring customer satisfaction – Customer relationships management – Customer acquisition, Retaining, Defection.

UNIT -5: Marketing Research & Trends In Marketing

(9)

Marketing Information System – Research Process – Concepts and applications: Product – Advertising – Promotion – Consumer Behaviour – Retail research – Customer driven organizations - Cause related marketing - Ethics in marketing –Online marketing trends

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		Pos
CO1	Knowledge of analytical skills in solving marketing related problem.	L2, L4
CO2	Awareness of marketing management process	L2, L3
CO3	Identify the scope and significance of Marketing in Domain Industry	L1, L2
CO4	Examine marketing concepts and phenomenon to current business events In the Industry.	L6, L4
CO5	illustrate market research skills for designing innovative marketing strategies for business firms	L3, L4

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

TEXT BOOKS:

1. Philip Kotler and Kevin Lane Keller, Marketing Management, PHI 14/e, 2012
2. Paul Baines, Chris Fill and Kelly Page, Marketing, Oxford University Press, 2/e, 2011.
3. Kotler, Philip (2002) Marketing Management, Millennium Edition. Intl ed. US: Prentice Hall, 2002

REFERENCE BOOKS:

1. Philip Kotler and Kevin Lane Keller, Marketing Management, PHI 14th Edition, 2012
2. KS Chandrasekar, "Marketing management-Text and Cases", Tata McGraw Hill, First edition, 2010
3. Lamb, Hair, Sharma, McDaniel – Marketing – An Innovative approach to learning and teaching – A South Asian perspective, Cengage Learning – 2012
4. Paul Baines, Chris Fill and Kelly Page, Marketing, Oxford University Press, 2/e, 2011.
5. Michael R. Czinkota & Masaaki Kotabe, Marketing Management, Cengage, 2000.

REFERENCE WEBSITE:

<https://nptel.ac.in/courses/110104068>
<https://www.youtube.com/watch?v=uTIIfDBH80HU&list=PLPjSqITyvDeUgSjU9XcEdZmd5Epz1L-Yn>
<https://www.youtube.com/watch?v=XD7Ie16qMT4&list=PLNsppmbLKJ8JSbzCxO8TYG8HDxxO5sSmV>

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

23MRIEM3	SUPPLY CHAIN MANAGEMENT	L	T	P	C
	(Common to Branches)	3	0	0	3

PRE-REQUISITES:

COURSE EDUCATIONAL OBJECTIVES:

- Provide Knowledge on logistics and supply chain management
- Enable students in designing the distribution network
- Train the students in knowing the supply chain Analysis
- Impart knowledge on Dimensions of logistic
- know the recent trends in supply chain management

UNIT –1: STRUCTURE ANALYSIS BY POWDER X-RAY DIFFRACTION: (9)

Introduction- Bragg's law of diffraction- Intensity of Diffracted beams —factors affecting Diffraction Intensities - structure of polycrystalline Aggregates- Determination of crystal structure- Crystallite size by Scherrer and WH Methods- Small angle X-ray scattering (SAXS) (in brief).

UNIT –2: MICROSCOPY TECHNIQUE -1—SCANNING ELECTRON MICROSCOPY (SEM) (9)

Introduction- Principle- Construction and working principle of Scanning Electron Microscope- Specimen preparation- Different types of modes used (Secondary Electron and Backscatter Electron)- Advantages- limitations and applications of SEM.

UNIT –3: MICROSCOPY TECHNIQUE -2 - TRANSMISSION ELECTRON MICROSCOPY (TEM) (9)

Construction and Working principle- Resolving power and Magnification- Bright and dark fields- Diffraction and image formation- Specimen preparation- Selected Area Diffraction- Applications of Transmission Electron Microscopy- Difference between SEM and TEM- Advantages and Limitations of Transmission Electron Microscopy.

UNIT –4: SPECTROSCOPY TECHNIQUES (9)

Principle- Experimental arrangement- Analysis and Advantages of the spectroscopic techniques — (i) UV-Visible spectroscopy (ii) Raman Spectroscopy- (iii) Fourier Transform infrared (FTIR) spectroscopy- (iv) X-ray photoelectron spectroscopy (XPS).

UNIT –5: ELECTRICAL & MAGNETIC CHARACTERIZATION TECHNIQUES (9)

Electrical Properties analysis techniques (DC conductivity- AC conductivity) Activation Energy- Effect of Magnetic field on the electrical properties (Hall Effect). Magnetization measurement by induction method- Vibrating sample Magnetometer (VSM) and SQUID (Superconducting Quantum Interference Device).

Total Hours: 45

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

COURSE OUTCOMES:

On successful completion of the course, students will be able to		Pos
CO1	Understand the strategic role of logistic and supply chain management in the cost reduction and offering best service to the customer	L2
CO2	Understand Advantages of SCM in business	L2
CO3	Apply the knowledge of supply chain Analysis	L4, L2
CO4	Analyze reengineered business processes for successful SCM implementation	L6, L4
CO5	Evaluate Recent trend in supply chain management	L3, L4

TEXT BOOKS:

1. Sunil Chopra and Peter Meindl, Supply Chain Management – “Strategy, Planning and Operation”, 3rd Edition, Pearson/PHI, 2007
2. Supply Chain Management by Janat Shah Pearson Publication 2008

REFERENCE BOOKS:

1. A Logistic approach to Supply Chain Management – Coyle, Bardi, Longley, Cengage
a. Learning, 1/e
2. Donald J Bowersox, Dand J Closs, M Bixby Coluper, "Supply Chain Logistics Management", 2nd edition, TMH, 2008.
3. Wisner, Keong Leong and Keah-Choon Tan, "Principles of Supply Chain Management A Balanced Approach", Cengage Learning, 1/e
4. David Simchi-Levi et al, "Designing and Managing the Supply Chain" – Concepts

REFERENCE WEBSITE:

<https://nptel.ac.in/courses/109105494>

<https://nptel.ac.in/courses/110108056>

<https://nptel.ac.in/courses/110106045>

<https://nptel.ac.in/courses/110105141>

[illegible]

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

23MRIEM4	STRATEGIC MANAGEMENT FOR COMPETITIVE ADVANTAGE	L	T	P	C
	(Common to Branches)	3	0	0	3

PRE-REQUISITES:

COURSE EDUCATIONAL OBJECTIVES:

- Explain Strategic Management concepts and their use in business
- Provide information pertaining to Business, Corporate and Global Reforms
- Learn various steps in strategic implementation.
- Acquaint the learners with recent developments and trends in the business corporate world
- Provide importance of corporate Governance and Ethical Issues.

UNIT –1: Basic concepts

(9)

Basic Concepts of Strategic Management, Strategic Management Process, Vision, Mission and Goals, Benefits and Risks of Strategic Management, Levels of Strategies Concepts of corporate strategy, Corporate, Business and Operational Level Strategy, Functional Strategies: Human Resource Strategy, Marketing Strategy, Financial Strategy, Operational Strategy Business Environment: Components of Environment Micro and Macro and Environmental Scanning. Competitive Analysis - Competition and Competitor Analysis, Porter Five Forces Model Internal Corporate analysis, Sustainability, Value Chain Analysis.

UNIT –2: Strategic Formulation:

(9)

Strategic Choices and Importance, Formulation of Alternative Strategies: Generic Strategies, Grand Strategy, Diversification Mergers, Acquisitions, Takeovers, Joint Ventures, Diversification, Turnaround, Divestment and Liquidation. Strategic Analysis and Choice: Issues and Structures, Corporate Portfolio Analysis-SWOT Analysis, BCG Matrix, GE Nine Cell Matrix, Hofer's Matrix, ETOP-Environmental Threat and Opportunity Profile, Strategic Choice-Factors and Importance.

UNIT –3: Strategic Implementation:

(9)

Strategy Implementation - Strategy and Structure Steps, Importance and Problems, Resource Allocation-Importance & Challenges Strategic 7S Framework; Management of Change Strategy Implementation - Organizational culture and Leadership; Functional Strategies.

UNIT –4:

(9)

Strategic Evaluation, Monitoring and Control - Strategic Controls; Balanced Scorecard; Strategy map Evaluation and Control: Importance, Limitations and Techniques Budgetary Control: Advantages, Limitations. Corporate Restructuring Strategies: Concept, Need and Forms, Corporate Renewal Strategies: Concept, Internal and External factors and Causes.

UNIT –5:

(9)

Corporate Governance and Ethical Issues, Corporate Social Responsibility and sustainability, Strategic Enablers: Innovation and Entrepreneurship, Knowledge Management, Technology Management. Public Private Participation: Importance, Problems and Governing Strategies of PPP Model. Information technology Driven Strategies: Importance, Limitations and contribution of IT sector in Indian Business. Start-up Business Strategies and Make in India Model: Process of business startups and its Challenges, Growth Prospects and government initiatives in Make in India Model with reference to National manufacturing, Contribution of Make in India Policy in overcoming industrial sickness

Total Hours: 45

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

COURSE OUTCOMES:

On successful completion of the course, students will be able to		Pos
CO1	Understand new forms of Strategic Management concepts and their use in business	L1, L2
CO2	Summarize strategic formulation process.	L2, L3
CO3	Develop analytical skills to solve cases and to provide strategic solutions	L3, L4
CO4	Understand Strategic Evaluation, Monitoring and Control	L1, L2
CO5	Create awareness on corporate Governance and Ethical Issues.	L3, L4

TEXT BOOKS:

1. Strategic Management, A Dynamic Perspective-Concepts and Cases– Mason A. Carpenter, Wm. Gerard Sanders, Prashant Salwan, Published by Dorling Kindersley (India) Pvt Ltd, Licensees of Pearson Education in south Asia.
2. Strategic Management and Competitive Advantage-Concepts Jay B. Barney, William S. Hesterly, Published by PHI Learning Private Limited, New Delhi.
3. Strategic Management Formulation, Implementation and Control, Pearce & Robinson, McGraw-Hill Publications.

REFERENCE BOOKS:

1. Crafting and Executing Strategy – The Quest for Competitive Advantage, Thomson & Strickland, McGraw-Hill Publications, 21st edition.
2. Exploring Strategy – Text and Cases, Gerry Johnson, Richard Whittington, Kevan Scholes, Duncan Angwin, and Patrick Regner, Pearson, 10th edition.
3. Strategic Management - Planning for Domestic and Global Competition, John A. Pearce II, Richard B. Robinson, Amita Mital, McGraw Hill Education, 14th edition.
4. Contemporary Strategy Analysis – Text and Cases, Robert M. Grant, 8th ed, John Wiley & Sons Inc.
5. Strategic Management – An Integrated Approach, Charles Hill & Gareth Jones, Cengage Learning, 9th edition.

REFERENCE WEBSITE:

<https://nptel.ac.in/courses/110105161>
<https://nptel.ac.in/courses/110108161>

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

23MRIEM5	SIX SIGMA & LEAN MANUFACTURING	L	T	P	C
		3	0	0	3

PRE-REQUISITES:

COURSE EDUCATIONAL OBJECTIVES:

- Teach the students, the basic concepts of six sigma and lean manufacturing.
- Expose with various quality issues in Inspection.
- Gain Knowledge on quality control and its applications to real time.
- Know the extent of cellular manufacturing and 5S.
- Understand the importance of Quality standards in manufacturing.

UNIT -1: (9)

Introduction to Six-Sigma

Probabilistic models-Six Sigma measures-Yield-DPMO-Quality level-Reliability function using Six-Sigma- MTTF using Six Sigma-Maintenance free operating period- Availability using Six- Sigma - Point availability-Achieved availability-Operational Availability-Examples.

UNIT -2: (9)

The Elements of Six Sigma and their Determination

The Quality Measurement Techniques: SQC, Six Sigma, Cp and Cpk- The Statistical quality control (SQC) methods-The relationship of control charts and six sigma-The process capability index (Cp)Six sigma approach-Six sigma and the 1.5 a shift-The Cpk Approach Versus Six Sigma-Cpk and process average shift- Negative Cpk-Choosing six sigma or Cpk-Setting the process capability index-Examples.

UNIT -3: (9)

Introduction to Lean Manufacturing

Conventional Manufacturing versus Lean Manufacturing — Principles of Lean Manufacturing — Basic elements of lean manufacturing — Introduction to LM Tools.

UNIT -4: (9)

Cellular Manufacturing, JIT, TPM

Cellular Manufacturing — Types of Layout, Principles of Cell layout, Implementation. JIT — Principles of JIT and Implementation of Kanban. TPM — Pillars of TPM, Principles and implementation of TPM.

UNIT -5: (9)

Set Up Time Reduction, TQM, 5S, VSM 10

Set up time reduction — Definition, philosophies and reduction approaches. TQM Principles and implementation. 5S Principles and implementation - Value stream mapping procedure and principles..

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		Pos
CO1	Summarize various techniques that are related to the six-sigma and lean manufacturing	L2
CO2	Outline the concepts of cellular manufacturing, JIT and TPM	L2, L3
CO3	Illustrate the principles and implementation of 5S techniques	L1, L2
CO4	Discuss procedure and principles of value stream mapping	L6, L4
CO5	Determine the reliability function using six-sigma.	L3, L4

TEXT BOOKS:

1. U Dinesh Kumar, Crocker, Chitra and Harith Saranga, Reliability and Six Sigma, Springer Publishers.
2. Sung H. Park, Six Sigma for Quality and Productivity Promotion, Asian Productivity Organization

REFERENCE BOOKS:

1. Sammy G. Shina, Six Sigma for Electronics Design and Manufacturing, McGraw-Hill.
2. Design and Analysis of Lean Production Systems, Ronald G. Askin & Jeffrey B. Goldberg, John Wiley & Sons, 2003.
3. **Mikell P. Groover** (2002) Automation, Production Systems and **CIM**.
4. **Rother M.** and Shook J, 1999 Learning to See: Value Stream Mapping to Add Value and Eliminate Muda, Lean Enterprise Institute, Brookline, MA.

REFERENCE WEBSITE:

<https://nptel.ac.in/courses/110105123>

<https://nptel.ac.in/courses/110105039>

SREENIVASAINSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)

23MRIEM6	APPLIED PROJECT WORK	L	T	P	C
		-	-	6	3

PRE-REQUISITES: Nil.