

**COURSE CURRICULUM FOR M. TECH
IN
INNOVATION AND ENTREPRENEURSHIP
(FROM 2022 ONWARDS)**



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COURSE STRUCTURE

1ST SEMESTER				
Sl.no	Course code	Course name	L-T-P	Credits
1.	MH-510	Innovation, Technology & Entrepreneurship	3-0-0	3
2.	MH-511	Managerial economics for entrepreneurs	3-0-0	3
3.	MH-512	Integration of ERP and Ecommerce	3-0-0	3
4.	MH-513	Elective I-Engineering	3-0-0	3
5.	MH-514	Elective II-Management	3-0-0	3
6.	MH-515	Skill development session	0-0-3	1.5
7.	MH-516	Industrial Exposure	0-0-3	1.5
				18 Credits
2ND SEMESTER				
1.	MH-520	IPR and Business Law	3-0-0	3
2.	MH-524	Logistic and Supply Chain Management	3-0-0	3
3.	MH-525	Business communication	3-0-0	3
4.	MH-526	Elective-I Engineering	3-0-0	3
5.	MH-527	Elective-II Management	3-0-0	3
6.	MH-528	Business plan presentation (project proposal and appraisal)	0-0-3	1.5
7.	MH-529	Industrial Exposure	0-0-3	1.5
				18 credits
3RD SEMESTER				
1.	MH-611	Teaching in UG	X-X-X	
2.	MH-612	Summer internship project	0-0-8	4
3.	MH-613	Project phase-I (seminar/report/viva-voce)	0-0-28	10
				14 credits
4TH SEMESTER				
1.	MH-621	Teaching in UG	X-X-X	
2.	MH-622	Project phase-II (seminar/report/viva-voce)	0-0-30	15
				65 credits

ELECTIVES (I & II)			
Semesters	Electives	subject code	course name
1 st Semester	Engineering-I	MH-513	Application of Appropriate Technology
	Management-II	MH-514	Financial Management
2 nd Semester	Engineering -I	MH-526	Plant Layout and Design
	Management-II	MH-527	Integration of Marketing, Sales and Distribution

1 st Semester	2 nd Semester	3 rd Semester	4 th Semester	Total credit
18	18	15	16	65

Subject Code: MH-510

Subject Name: Innovation, Technology and Entrepreneurship

Credit Point: 3 (L=3, T=0, P=0)

A. Course Objectives:

The course is design to meet the following objectives:

1. To enable the students to learn the various aspects of innovation and methods of fostering Innovation
2. To understand the concept and theories of entrepreneurship
3. To recognize the qualities of entrepreneurs that contributed to their success.
4. To generate several ideas for potential businesses based on important trends and each student's interests

B. Course content

Introduction to Innovation: Creativity, Invention and innovation, Types of Innovation, Stages of Innovation, Idea generation, essentials of Innovation, Innovation framework, Innovation Management, Innovation Risks, Relevance of Technology for Innovation, The Indian innovations and opportunities, Innovation Process, Introduction to the bottlenecks of new product innovation process. Technology - Management of Innovation, Technology Strategy, Advanced Topics in Technology Management, Entrepreneurship and Technology Entrepreneurship, Preference of Indian Technology- major constraints and problems, major problems in Technology transfer, The Essence of Technology Transfer- Transfer within and between Nations- Price and Return for Transfer of Technology. Idea generation: Startup and Venture Development, Innovation and Startup ecosystem, Pre-incubation and Incubation stages, Govt. Schemes and funding support to idea, innovation and starup, current trends, development and general awareness on innovation and startup. Designing Your Funding Strategy & Startup Valuation, Funding Strategy Design & Pitch Deck Preparation. Design Thinking: Introduction to engineering design process and the concept of frugal engineering for developing innovative affordable products, effective user-interface Digital Technology Entrepreneurship: Industry 4.0 landscape and innovations using digital technologies like AI, IOT, AR/VR, Cloud, SAAS, User Applications. The basic technology framework and development platforms Entrepreneurship: Concepts of Entrepreneurship, Theories of Entrepreneurship, Leadership qualities, role and importance, Entrepreneurship in modern economy, entrepreneurs as innovator, Role of Government: Role of Central Government and State Government in promoting Entrepreneurship-Schemes and incentives Export Oriented – Fiscal and Tax concessions, Women Entrepreneurs, role in Economic development , problems and prospect, Entrepreneurship in global context – social and economic development. Role of Entrepreneurial Institutions in Entrepreneurship Development, Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC, Preparing of project proposal, criteria for appraisal and case study.

C. Text Books:

1. Weihrich , H. and Koontz, H (2016). Essentials of Management: An International, Innovation and Leadership, McGraw Hill Company, 10th Edition, 2016
2. Cetindamar, D., Phaal , R., Technology Management: Activities and Tools, 2nd Edition, Bloomsbury, 2016.
3. Sue Newell (Author), Josh Morton (Author), Marco Marabelli (Author), Robert Galliers (Author), Managing Digital Innovation: A Knowledge Perspective, Bloomsbury Publishing, 2019.
4. Rastogi, P.N. Management of Technology and Innovation: Competing Through Technological Excellence, 2ndEdition:2, SAGE Publications India Pvt Ltd, 2009 and 2012.

5. Lowe, R., and Marriott, S., Enterprise: Entrepreneurship and Innovation: Concepts, Contexts and Commercialization: Skills and Resources for Entrepreneurship and Innovation, A Butterworth-Heinemann, 2006.

D. Reference Books:

1. Drucker, P.F. Innovation and Entrepreneurship, Harper Business, 2006.
2. Kanungo, R.N “Entrepreneurship and innovation”, Sage Publications, New Delhi, 1998.
3. Lewrick, M., Link, P, and Leifer, L . The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems. Wiley (Design Thinking Series), 2018;
4. Cross, N. Design Thinking Understanding How Designers Think and Work, Bloomsbury publisher, 2019.

E. Course outcomes:

1. Understand the fundamental concepts of Technology, Innovation and Entrepreneurship
2. Understand the components in developing a business plan
3. Apply creative thinking techniques in addressing their customers’ and company’s needs
4. Assess and analyze entrepreneurship as a career choice
5. Demonstrate Students getting aware of how to make technology and process driven innovations for solving problems and how to convert their ideas into marketable solutions.

Subject Code: MH-511

Subject Name: Managerial Economics for Entrepreneurs

Credit Point: 3 (L=3, T=0, P=0)

A. Course Objectives:

The course is design to meet the following objectives:

1. To understand the fundamentals and importance of Managerial Economics in management and businesses.
2. To apply the principles of managerial economics in achieving business objectives.
3. Be equipped with the tools necessary in forecasting product demand
4. Understand and be able to apply latest pricing strategies
5. Understand and analyze the macro environment affecting the business decision making.

B. Course content

Basics of Economics: Basic Concepts, Scope, Importance and definitions, Relevant to Managerial Economics-Factors Influencing Managerial Decision — Managerial economics and other disciplines, Micro Economics and Macro Economics, Managerial Economics and its relevance in business decisions, Fundamental Principles of Managerial Economics. Demand and Supply Analysis: Theory of Demand, Types, Determinants, Demand Function, Demand curve, Law of Demand, Exceptions to the law of Demand, Shifts in demand curve, Elasticity of Demand and its measurement. Price Elasticity, Income Elasticity, Arc Elasticity. Cross Elasticity and Advertising Elasticity. Uses of Elasticity of Demand for managerial decision making, Demand forecasting meaning, significance and methods.(numerical Exercises) Case Studies Supply Analysis; Law of Supply, Elasticity; Analysis and its uses for managerial decision making. Price of a Product under demand and supply forces . Case Studies Cost concept, Break Even Analysis- Meaning, Assumption, Uses and Limitation, Break Even Point (BEP)- Meaning, Determinants of Break Even Point- Break Even Charts, linear approach (Simple numerical problems to be solved), Market Structure and Product Pricing :Perfect and Imperfect Market Structures. Conditions of Perfect Competition. Price of a Product under demand and supply forces. Equilibrium Price. Pricing under Monopoly and Monopolistic Competition. Pricing under Oligopoly. Kinked Demand Curve. Discriminating Prices. Inflation, Business cycle, National Income: Inflation- meaning, feature, Types, causes, Effects and Measures. Business Cycle – Features, Causes, Types, Theorie, Impacts/Effects of Business Cycle, Measures to Control Business cycle, National Income & Current Issues- Concepts of National Income, Factors Determining Level (Size)of National Income, Methods of Measurement of National Income, Choice of Methods of National Income, Importance of Measurement of National Income, Difficulties in Measuring National Income.

C. Text Books:

1. Dwevedi, D.N. Managerial Economics, 9thEdition, S Chand And Company Ltd, 2021
2. Allen, W.B., Weight, K., Doherty, N & Mansfield, E. Managerial Economics, 7/e, Viva Books Private Limited ,2020
3. Paul . K., Philip, Y.K., Steve, E , Dickinson, C and Banerjee, S. Managerial Economics | Seventh Edition , Pearson Education, 2017

D. Reference Books:

1. Gupta, D. Managerial Economics, Dream tech Press, 2019
2. PNG, I., Managerial Economics, 5th Edition, Routledge, 2018
3. *Gupta, G.S. Managerial Economics, Joel Dean, Englewood Cliffs, N.J.: Prentice- Hall, 2011*
4. Varshney, S.C., Managerial Economics, New Delhi Sultan Chand & Sons, 20010

E. Course outcomes:

1. Understand the fundamentals of Managerial Economics
2. Understand and the use of Economic concepts in making business decision
3. Analyze economic tools with respect to acceptance or rejection of investment proposals
4. Demonstrate the recent trends relating to economic environment
5. Apply various techniques to forecast demand for better utilization of resources

Subject Code: MH-512

Subject Name: Integration of ERP & E-Commerce

Credit Point:3 (L=3, T=0, P=0)

A. Course Objectives:

1. Define E-Market places and their components.
2. List the Major types of Electronic Markets and describe the features.
3. Describe the types of Intermediaries in EC and the its roles.
4. Describe electronic Catalogs, Shopping carts, and search Engines.
5. Describe the various types of Auctions and list their characteristics.

B. Course Content:

Introduction: Basic ERP Concepts, Risk of ERP, ERP Solution and its Utility, Benefits of ERP, Implementation of ERP, ERP Operation & Maintenance, ERP and Related Technologies, Business Intelligence, Business Analytics, Data warehousing, Data Mining, Supply Chain Management (SCM), Customer Relationship Management (CRM), Geographical Information System (GIS), Introduction to E-Business and E-Commerce, E-Marketplaces: Structures, Mechanisms, Economics & Impacts, The Impact of E-Business on Different Fields and Industries, The Business Module, Startup businesses Model, Security Technologies, IoT Applications. Digitizing the business-E-business patterns: the structural foundation (click and brick pattern, portal pattern, e-market maker pattern), Interlocking layers of e-business Self diagnosis Operational, Service and continuous innovation excellence models, The new era of cross functional integrated applications, Problems caused by lack of integration, Roadmap to move a company into e-business, 8s.

C. Text Books:

1. Bajaj, K,E, Commerce – The cutting edge of business TMH 2011
2. Bharat, B, Electronic Commerce Framework, Technologies and Applications TMH, 3rd edition. 2011
3. Turban, E. et al., Electronic Commerce: A Managerial Perspective, Prentice Hall- 2008.
4. Dave Chaffey , Electronic Business and Electronic Commerce Management, 2nd edition, , Prentice Hall, 2006

D. Reference Books:

1. David Whitley , E-Commerce-Strategy, Technologies & Applications by, TMH
2. Kamlesh K. Bajaj, E-Commerce- The cutting edge of business by TMH
3. W Clarke, E-Commerce through ASP by - BPB
4. Mathew Reynolds, Beginning E-Commerce with VB, ASP, SQL Server 7.0 & MTS by, Wrox Publishers
5. Christopher Westl and Theodore H. K Clark Global Electronic Commerce- Theory and Case Studies by J, University Press

E. Course Outcomes:

1. Understand the basic concepts and technologies used in the field of management information systems.
2. Demonstrate the processes of developing and implementing information Systems.
3. Be aware of the ethical, social, and security issues of information systems.
4. Understand the role of information systems in organizations, the strategic management processes, and the implications for the management.
5. Develop an understanding of how various information systems work together to accomplish the information objectives of an organization

Subject Code: MH-513

Subject Name: Application of Appropriate Technology

Credit Point: 3 (L=3, T=0, P=0)

B. Course Objectives:

1. To have complete knowledge on design of photovoltaic cells and wind turbines.
2. To study the energy production from the bio-gas resources.
3. To enrich in how the renewable energy gets integrated with the grid
4. To understand the concepts and applications of Flexible Manufacturing Systems.
5. To identify the sources and quantity of surface and ground water bodies.

C. Course Content:

Renewable Energy: Solar Energy- Production and transfer of solar energy - Solar radiation at the earth's surface – Measuring techniques and estimation of solar radiation – Solar thermal collectors - principle of photovoltaic conversion of solar energy, types of solar cells - Photovoltaic applications: battery charger, domestic lighting, street lighting, water pumping - solar PV power plant – Net metering concept. Wind Energy: Power in the wind – Factors influencing wind – wind data and energy estimation - wind speed monitoring - Types of wind power conversion systems –wind energy conversion devices – wind energy potential and installation in India - Repowering concept- Wind power plant design. Bio-based Energy Sources: Energy from biomass – Sources of biomass – Different species – Conversion of biomass into fuels – Energy through fermentation – Pyrolysis, gasification and combustion – Aerobic and anaerobic bio-conversion – Properties of biomass – Biogas plants – Types of plants – Design and operation Flexible Manufacturing System FMS: Introduction to FMS – concepts, advantages, development of manufacturing systems, major components of FMS, types of flexibility, FMS application – single product, single batch, n-batch scheduling problem. Sanitation and water supply: Public Water Supply Scheme and Quantity of Water: Necessary and objectives of public water supply schemes – planning and financing ,Quantity of water ,water requirements, continuous and intermittent supply, rate of demand, variations in rate of demand ,its effect on design, design periods and capacities of different components, population growth and forecast, estimating the quantity of water required Purification of water Treatment of water- working principles, Purpose and design of all the unit process of water treatment, screening, plain sedimentation, coagulation sedimentation, filtration, disinfection, water softening. Technology on water harvesting, Biomass energy Solid waste Management (SWM): source, collection, disposal methods, waste to energy conversion method.

D. Text Books:

1. Pami Aalto, Electrification: Accelerating the Energy Transition, Academic Press, 2021.
2. Kanoğlu, M., Çengel, Y.A. and Cimbala, J.M., 2020. Fundamentals and applications of renewable energy. McGraw-Hill Education.
3. Kishore, V.V.N. ed., 2010. Renewable energy engineering and technology: principles and practice. The Energy and Resources Institute (TERI).
4. Rathore, N.S. and Panwar, N.L., 2021. Fundamentals of Renewable Energy. CRC Press.
5. Kalpakjian S, Manufacturing Engineering and Technology, Addison-Wesley Publishing Co., 1995.
6. Garg. S.K., “Water Supply Engineering”, Khanna Publishers, Delhi, September, 2001.
7. Duggal.K.N., “Elements of Public Health Engineering”, S.Chand and Co, 1985
8. Birdie. G.S., “Water Supply and Sanitary Engineering”, Dhanpat Rai and sons, 1991.

E. Reference Books:

1. Ahmed: Wind energy Theory and Practice, PHI, Eastern Economy Edition, 2012
2. G.N. Tiwari ,Solar Energy-Fundamentals, Design, Modelling and Applications, Narosa Publishers, 2002.
3. Kreith, F and Kreider, J. F., Principles of Solar Engineering, McGraw Hill, 1978.
4. Kothari , Renewable Energy Sources and Emerging Technologies, PHI, Eastern Economy Edition, 2012
5. Groover M. P., Automation, Production Systems and Computer Integrated Manufacturing, Prentice Hall of India Pvt., New Delhi, 1996.
6. Steel. E.W.et al., “Water Supply Engineering”, Mc Graw Hill International book Co, 1984
7. Mark J. Hammer “Water and Waste Water Technology”, Prentice Hall of India Pvt. Ltd, New Delhi, 2008
8. Fair. G.M., Geyer.J.C., “Water Supply and Wastewater Disposal”, John Wiley and Sons, 1954

F. Course Outcomes:

Upon completion of the subject:

1. Possess the ability to design a photovoltaic and wind based energy generation model
2. Explore the knowledge on producing energy for bio-wastes/waste management
3. Understand how the generated renewable form of energy gets integrated with the grid
4. Demonstrate ability to perform scheduling and control of Flexible Manufacturing Systems.
5. Analyse the knowledge about the various public water demands and purification process.

Subject Code: MH-514

Subject Name: Financial Management

Credit Point: 3[L=3, T =0, P=0]

A. Objectives:

The course is designed to meet the following objectives:

1. To learn concept, definition and application of financial management, financial accounting and cost accounting.
2. To explore the application financial statements, budgeting process, investment etc
3. To enable entrepreneurs to understand importance of financial management.
4. To introduces students to the fundamental principles and procedures of accounting with emphasis on how financial statements communicate information about the business corporation 's performance and position for users external to management.

B. Course Content:

Financial management Meaning, Scope of Finance, Objective of Financial management, Financial Decisions in Firm, Functions of Financial Management, ratio analysis, managerial accounting, Changing role of Financial Management Financial Accounting Definition and scope, objectives of financial accounting, accounting concepts and conventions, end user of accounting information and limitation of financial accounting, preparation of statement- Trading account, Profit & Loss account and Balance sheets. Cost Accounting Definition and concept of cost, costing, cost accounting & cost accountancy, objective of cost accounting, advantages and limitation of cost accounting, classification of cost & type of costs, Preparation of cost sheet. Capital budgeting Meaning of Capital Budgeting, Significance, Capital Budgeting process, Project, Classification and Investment Criteria, Techniques of capital budgeting, TVM-Time value of Money. Capital Structure and Leverages: Meaning of Capital Structure, Optimum Capital Structure, Factors determining capital Structure, Theories of capital structure. Leverages, Operating Leverage, Financial Leverage and Combined Leverage

C. Text Books:

1. Rajiv & Misra Financial Management, Oxford publication 2018
2. MY Khan and PK Jain Financial Management & Practice. Tata McGraw Hill, 2017
3. Narayanaswamy R., -Financial Accounting-A Managerial Perspective, 4th Edition, PHI. 2012
4. Tulsian P.C. -Financial Accounting, Tata McGraw Hill, 2012.

D. Reference Books:

1. I.M.Pandey Financial Management, Tata McGraw Hill 2017
2. Prasanna Chandra Financial Management Theory & Practice., Tata McGraw Hill 2015
3. Vijayakumar,T , Accounting for Management, McGraw Hill, 2011.

E. Programme Outcomes:

1. Awareness of financial management
2. Enable to prepare capital budget and self-learning by self-practice.
3. Enable to prepare budget, cost sheet, final account, budgeting techniques.
4. Students will have a basic understanding of how financial information is captured, recorded, reported and analyses.
5. Students will be able to judge and compare the financial health of different companies over a period of time.

Subject Code: MH -520
Subject Name: IPR and Business law
Credit Point:3 (L=3, T=0, P=0)

A. Course Objectives:

The course is designed to meet the following objectives:

1. To provide teaching with inclusive learning.
2. To make students aware about the importance of this subject in their future
3. The Legal Aspects of Business is primarily study of that branch of law which governs and regulates the trade and commerce, with the help of leading cases.
4. The Business Law in India is mainly based upon the English Mercantile Law, precedents, local customs and usages and the Indian Statute Law.

B. Course Content:

IPR-Intellectual property, definition, types, rights and functions, patents, trademark, software design, industrial designs, semi-conductor and integrated circuits layout design, grant of patent in India, authority and procedure, patent forms, surrender and revocation of patents and compulsory licensing, acquisition of inventions by the Government. IPR II: Contents of draft application for patents, Drafting patent specification and claims, WTO and drafting patent specification and claims, IPR infringement and piracy under Indian Laws, Business law: Contract Act, 1872 Definition of a Contract and its essentials, Formation of a valid Contract - Offer and Acceptance, Consideration, Capacity to Contract, Free consent, Legality of object, Discharge of a Contract by performance, Impossibility and Frustration, Breach, Damages for breach of a contract, Quasi contracts, Contract of Indemnity and Guarantee, Bailment and Pledge, Agency. Partnership Act, 1932 Definition of Partnership and its essentials, Rights and Duties of Partners : Types of Partners, Minor as a partner, Doctrine of Implied Authority, Registration of Firms, Dissolution of firms. Sale of Good Act, 1930 -Definition of a Contract of Sale, Conditions and Warranties, Passing of Property, Right of Unpaid Seller against the Goods, Remedies for Breach. Consumer protection act-, LLP-Limited Liability Partnership-main features, company amendment act 2013-main features.

C. Text Books:

1. Rockman, Howard B. Intellectual Property Law for Engineers, Scientists, and Entrepreneurs, Wiley, 2020
2. Sinnreich, Aram. The Essential Guide to Intellectual Property, Yale University Press, 2019.
3. Thomas, Mathew, Understanding Intellectual Property, Eastern Book Company, 2016.

D. Reference Books:

1. Nithyananda, K V. Intellectual Property Rights: Protection and Management. India, IN: Cengage Learning India Private Limited, 2019.
2. Ahuja, V K. Law relating to Intellectual Property Rights in India: Lexis Nexis, 2017.
3. Neeraj, P., & Khusdeep, D. Intellectual Property Rights in India, PHI learning Private Limited, 2014.

E. Course Outcomes:

By the end of this course you will be able to:

1. Distinguish and explain various forms of IPRs.
2. Identify criteria's to fit one's own intellectual work in particular form of IPRs.
3. Analyse rights and responsibilities of holder of Patent, Copyright, Trademark, Industrial Design, etc
4. Identify procedure to protect different forms of IPRs national and international level.
5. Apply statutory provisions to protect particular form of IPRs.
6. After Completion of course the students shall get thorough knowledge of managing business in accordance with various provisions of the corporate laws and avoid serious consequences that could possibly arise out of ignorance of law.

Subject Code: MH-524

Subject Name: Logistic and Supply Chain Management

Credit: 3 (L=3, T=0, P=0)

A. Course Objectives

The course is design to meet the following objectives:

1. To describe the various streams of the supply chain
2. To describe the concepts employed in the supply chain
3. To explain about the strategies employed in the supply chain
4. To get clear view about the concepts employed in the different logistical background.
5. To explain the different drivers of logistics.
6. To describe how the various green supply chain practices can actually save money, increases efficiency and reduce delivery time.

B. Course content:

Concepts of Supply Chain: , Introduction to supply chain management, The management components of supply chain management, Service and manufacturing supply chain dynamics - Evolution of supply chain management - Multiple views and flows - Service supply chains - Manufacturing supply chains - Measures of supply chain performance - Bullwhip effect, Eight supply chain processes, Electronically linking the supply chain, Supply chain performance measurement, Developing and implementing partnerships in the supply chain Supply chain Processes and Strategies Integrated supply chains design- Customer relationship process - Order fulfilment process - Supplier relationship process - Supply chain strategies - Strategic focus - Mass customization - Lean supply chains - Outsourcing and offshoring - Virtual supply chains. Supply Chain performance drivers: Drivers of supply chain performance - Logistics drivers (Location, inventory and transportation) - Cross functional drivers (Pricing, information and sourcing) – Forecasting introduction - Framework for a forecast system - Choosing right forecasting technique - Judgment methods Role of Distribution in Supply chain, Distribution channels – Functions, resources, Operations in Distribution, Designing Distribution network models - its features - advantages and disadvantages Role of Transportation in Logistics and Business, Principle and Participants-Scope and rrelationship with other business functions, Modes of Transportation - Mode and Carrier selection, Routing and scheduling. Green Supply : Traditional Supply Chain and Green Supply Chain – Environmental Concern and Supply Chain – Closed-loop Supply Chain – Corporate Environmental Management – Green Supply Chain (GSCM): Definition, Basic Concepts – GSCM Practices Role of Distribution in Supply chain, Distribution channels – Functions, resources, Operations in Distribution, Designing Distribution network models - its features - advantages and disadvantages Green Logistics and Transportation – Definitions of Green Logistics – Critical drivers of Green Logistics – Green transportation and logistics practices – Environmental impacts of transportation and logistics – Closing the Loop: party and Reverse Logistics.

C. Text books:

1. David Lowe, Lowe's Transport Manager's and Operator's Handbook 2019
2. Janat Shah, Supply Chain Management, Pearson Education India,2nd edition 2016
3. Joseph Sarkis, Yijie Dou. Green Supply Chain Management: A Concise Introduction, Routledge, 2017.
4. CharisiosAchillas, Dionysis D. Bochtis, Dimitrios Aidonis, Dimitris Folinias. Green Supply Chain Management, Routledge, 2018.
5. Raghuram and N. Rangaraj, Logistics and Supply chain Management - Leveraging Mathematical and Analytical Models: Cases and Concepts, New Delhi: Macmillan, 2000.

D. Reference Book:

1. Sunil Chopra, Peter Meindl, Supply Chain Management: Strategy, Planning, and Operation, Pearson, 6th edition 2014.
2. Michael B Stroh, Practical Guide to Transportation and Logistics, Logistics Network, 2006.
3. Alan Rushton, John Oxley, Handbook of Logistics & Distribution Management, Kogan Page Publishers, 2006.
4. Hsiao-Fan Wang, Surendra M. Gupta. Green Supply Chain Management: Product Life Cycle Approach, McGraw Hill publishing, 2011
5. Stuart Emmett, Vivek Sood. Green Supply Chains: An Action Manifest by Stuart Emmett, Wiley publications, 2010

E. Course Outcomes:

1. Apply fundamental knowledge of management with logistics and supply chain for a business enterprise.
2. Demonstrate knowledge, skills and techniques of quantitative method to improve the logistics and supply chain operations.
3. Apply the fundamental concepts of logistics and supply chain related to national and international business system.
4. Improve the logistics and supply chain processes using the advanced operations such as quality, lean, strategy and green to ensure sustainable business practices.
5. Acquire knowledge of the fundamental concepts of Green Supply Chain and its application.
6. Develop analytical skills using advancements in information technology to implement the concepts of logistics and supply chain system to aid decision making.

Subject Code: MH -525

Subject Name: Business Communication

Credit Point:3 (L=3, T=0, P=0)

A. Course Objectives:

The course is designed to meet the following objectives:

1. To understand the significance of communication in professional settings
2. To make learners identify the kind of language required for successful business
3. To enable the learners to practice the style and structure of different business communication models in speaking, listening, reading and writing.
4. To impart the correct practices of the strategies of effective communication.

B. Course Content:

Introduction to Communication, Process of Communication, Forms of Communication, Barriers of Communication, Importance of Communication, Features of Successful Professional Communication, Communication Network in Organization, Role of Critical and Creative Thinking in Communication, role of Emotion in Communication, Communication in Action, Persuasive Skills, Purpose of Professional Communication, Kinesics (Body Language), Paralanguage (Voice), Art of Effective Reading, Listening Skills, Basics of Written Communication, Written Analysis of Cases, Letter Writing, Memos and Minutes of Meeting, Resumes and Cover Letter, Business Reports and Proposals, Presentation Skills- Oral and Poster, E-mail and Blogs, Telephone Etiquette, Organizational Communication, Cross-Cultural Communication, Public Speaking, Interview Prowess, Corporate Etiquette, Grooming, Clothing and Accessorizing, Personality Development and Soft Skills. Transactional Analysis, Art of Negotiations, Communication Workshops.

C. Text Books:

1. Nawal, Nawal. Business Communication, engage India, 2020.
2. Kolb, Deborah M., Jessica L. Porter, Negotiating at Work: Turn Small Wins into Big Gains, John Wiley & Sons, 2015.
3. Gelb, Michael J. Mastering the Art of Public Speaking, New World Library, 2020.

D. Reference Books:

1. Mitra, Barun K. Personality Development and Soft Skills, OUP, 2016.
2. Mukerjee, Hory Sankar. Business Communication, OUP, 2016.
3. Budhale, Prajeet. The Golden Book of Business Presentation Skills, Bloomsbury, 2021.

E. Course Outcomes:

By the end of this course you will be able to:

1. Discuss how communication works and why it is important
2. Identify the various barriers and challenges faced in communication
3. Present and share your ideas with confidence in a professional setting
4. Write effective professional documents
5. Practice the effective way of communication with good personality traits and etiquette.

Subject Code: MH-526

Subject Name: Plant layout and design

Credit Point:3 (L=3, T=0, P=0)

A. Course Objectives:

1. Research is a design and plant layout
2. Clear views about modern technologies use in the plants and their layout
3. Advantages of flexible layout process
4. Students will be take appropriate actions that, in turn, maximizes the performance.

B. Course Content:

Introduction: Introduction to facilities planning and design, plant layout, material handling and their interrelationship. Site-Warehouse-Retail location. Case Study: New plant location. Basic Components of Plant Layout: Factors affecting plant layout: man, material, machine, movement, waiting, service, building and change, features and considerations of each factor. Plant Layout types and Design: Classical types of layouts, Modern Plant Layout, Product layout, Process layout, Fixed-position layouts, Cellular layouts and Hybrid layouts, Product-Oriented Layout: Production flow-line production, Assembly line balancing. Design of an assembly line, layout heuristics, line balancing. Material Handling: Concept of material handling, principles of material handling, factors affecting material handling, Advanced Design and Plant Layout: System Modelling, Drive controllers for plant automation, Sensors for plant automations, Machine Vision for inspection, Uses of modern technologies, Semi and fully automatic plant layout. Application of advanced technology for Industrial automation like industrial robot, manipulator, programming methodology, application, installation layout and planning. Technology layout, location of the plants, Geo-tag.

C. Text Books:

1. Jebelli Houtan, Habibnezhad Mahmoud, Shayesteh Shayan, Asadi Somayeh, Lee Sang Hyun, Automation and Robotics in the Architecture, Engineering, and Construction Industry, Springer, 2022
2. Odrey Nicholas, Weiss Mitchell, Groover Mikell, Nage Roger, Dutta Ashish, Industrial Robotics -Technology, Programming and Applications, SIE Publication, 2017
3. Geldermann Jutta, Integrated Process Design for the Inter-Company Plant Layout Planning of Dynamic Mass Flow Networks, KIT Scientific Publishing 2010

D. Reference Books:

1. Karimi Houshang, Naghaviha Davood, Nikkhajoei Hassan. Step-by-Step Design of Large-Scale Photovoltaic Power Plants. Wiley, 2022
2. Badhai B., Entrepreneurship Development, B. K. Publications Private Limited, 2019
3. Mujawar Wasiyoddin R., Psychology of Social Work Practice, Oxford publication, 2019.
4. JFahed-Sreih, Human Resource Planning for the 21st Century, London, IntechOpen, 2018

E. Course Outcomes:

1. Visualize Modern Plant Layout
2. Illustrate Plant Design
3. Relate Product Oriented Design
4. Schematize Modern Technologies in Plant

Subject Code: MH-527

Subject Name: Integration of Marketing, Sales and Distribution

Credit Point: 3 (L=3, T=0, P=0)

A. Course Objectives:

1. To demonstrate the basic concepts of Marketing
2. Develop skills in managing a sales team, dealer management and innovative sales strategies as the situation warrants.
3. Design and analyze the sales and distribution as a key function of the Marketing process.
4. Appraise and organize sales planning and budgeting, estimating market potential and sales forecasting, setting the sales territory and quotas
5. Managing marketing logistics and channels, Channel Management and Marketing channel policies.

B. Course Content:

The Concept of marketing - Evolution of marketing: From transaction based to relationship marketing- Marketing research and Decision support systems. Market segmentation, Targeting and Positioning: Meaning, Factors influencing segmentation, Market Aggregation, Basis for segmentation, Segmentation of Consumer. Targeting: Meaning, Basis for identifying target customers, Target Market Strategies. Positioning: Meaning, product differentiation strategies, tasks involved in positioning. Branding: Concept of Branding, Brand Types, Brand equity, Branding Positioning. Product Decisions: Concept, product hierarchy, new product development, diffusion process, Product Life cycle, Product mix strategies. Packaging / Labelling: Packaging as a marketing tool, requirement of good packaging, Role of labeling in packaging. Pricing Decisions: Pricing concepts for establishing value, Pricing Strategies-Value based, Cost based, Market based, Competitor based, New product pricing – Price Skimming & Penetration pricing, Base Methods of setting Price, pricing strategies and Policies. Advertising: Advertising Objectives, Advertising Budget, Advertising Copy, AIDA model, Distribution channels and physical distribution. Marketing communication and Promotion mix Strategies. Nature of international marketing: meaning, Framework for International Marketing-Barriers for International Marketing International Marketing Decisions: product Planning, Designing and Development for international markets-Pricing Decisions: Pricing Strategies And Price setting For International Markets. Introduction to sales Management, Role and duties of Sales Manager, The Selling Process and different theories of selling. Sales Promotion, Sales Forecasting and Budgeting Sales, Management of Sales territory and sales quota. People Management-Sales Outlook, Sales Organization and Importance of sales force, Training of sales force The motivation of sales force, Recruitment and selection, Compensation, Monitoring and control. Steps in service, activities in sales, steps in selling, social media advertising, market research and business analytics.

C. Text Books:

1. Warren J. Kegan: Global Marketing Management' 9th Edition Pearson Education, 2018.
2. Philip K., Marketing Management- The South Asian Perspective, 15th Edition, Pearson Education, 2017
3. Bhat, K.S. Sales and Distribution Management, Himalayan Publisher, 2017
4. Ghosh, P.K. Sales Management (Text and Cases), Himalayan Publisher, 2017

D. Reference Books:

1. Ramasamy,V.S and Namakumari, S. Marketing Management, 6th Edition, McMillan Publishers, 2018
2. Fundamentals of Marketing Management - Etzel M. J, B J Walker & William J. Stanton, 14/e, McGraw Hill Education Publishers, 2015.
3. Sahu., P.K., and Raut., K.C. (2010). “*Salesmanship and Sales Management*”. Vikas Publishing House Pvt. Ltd., Noida.
4. Chunawalla, S.A. Sales and Distribution Management,), Himalayan Publisher, 2018
Svend Hollensen : Global Marketing: A Decision-Oriented Approach- , Pearson Education 2009.

E. Learning Outcomes:

1. Understanding the role of marketing in making satisfied exchanges.
2. Able to use the variables of marketing management for successfully doing the business in the international arena.
3. Understand marketing Insights on application of basic marketing concepts.
4. Understand and Analyzing Business/ Consumer Markets and ability Identify & evaluate Market Segments and Targeting
5. Develop skills in managing a sales team, dealer management and innovative sales strategies as the situation warrants.