

Syllabus for Multi-Disciplinary Minor Degree

In

Management Science

Under the National Education Policy (NEP 2020)

(2023-2024)



Offered by

**DEPARTMENT OF HUMANITIES AND
MANAGEMENT SCIENCES (*PROPOSED*)**

INSTITUTE OF CHEMICAL TECHNOLOGY

(University Under Section-3 of UGC Act, 1956)

Elite Status and Center for Excellence

Government of Maharashtra

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A. PREAMBLE

The business world is characterized by changes in technologies, products, services, and the diversity of the workforce. Every business is driven by innovation and growth that is adding to the existing complexity of the business environment.

An integration of engineering sciences with management studies will enable a student to view any problem in the organization from a holistic perspective and help in rational decision making within given complex constraints. A minor management degree would help an engineer understand the softer side of the corporate world in terms of dealing with one's own attitudes, emotions and perceptions and diverse teams with sensitivity and empathy.

The course also aims to sensitize engineers towards ethical issues in business which otherwise would not be covered in the technical engineering syllabus. The various modules will help the student in understanding oneself and others and blend oneself into any organization as a fresh employee. The course would also be beneficial for students from business houses in understanding various aspects of business-like operations, supply chain management, Marketing and Human resource management. These modules will also help in a smooth transition of engineering graduates who choose management sciences as their future academic career option in premier management institutions in India and abroad.

Management science enables us to carve a well-rounded, holistic, and responsible engineer who understands technicalities and organizational aspects in this global world and can contribute to society ethically.

B. PROGRAMME SPECIFIC OBJECTIVES

PSO1	Self-awareness Understand oneself and introspect deeply to assess one's attitudes, perceptions and disposition towards various situations and apply the concepts to make the individual-situation interaction as smooth as possible
PSO2	Communication Ability to communicate effectively in a diverse organizational setting especially in a technology driven business situation, with both the organizational authorities and general society
PSO3	Leadership and Team culture Understand various group forming theories and apply the same in real life situations (in face of a diversity in workforce) and work collaboratively across organizational boundaries
PSO4	Professional Ethics Recognize and understand ethical dilemmas in business and apply and stay committed to professional ethics and act with integrity while meeting out one's duties and responsibilities.
PSO5	Generic and Domain Knowledge Ability to understand, exhibit, analyze, coherently collate, and apply theories and principles of various domains of management sciences to real life situations.

C. STRUCTURE OF THE MDM COURSE

Subject Code	Sem	Subject	Credits	Hrs/Week	Marks for various Exams
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				L	T	P	CA	MS	ES	Total
MGT1101	III	Organizational Behaviour	2	2	0		20	30	50	100
MGT1102	IV	Principles of management and Organization structures	2	2	0		20	30	50	100
MGT1103	V	Interpersonal processes and Human Resource Management	4	3	1		20	30	50	100
MGT1104	VI	Fundamentals of marketing management and Market research	2	2	0		20	30	50	100
MGT1105	VII	Professional ethics	2	2	0		20	30	50	100
MGT1106	VIII	Operations and Supply Chain management	2	2	0		20	30	50	100
		Total	14							

D. RECOMMENDED BATCH SIZE

Minimum 15 and Maximum 35

E. DURATION

6 Semesters

F. ELIGIBILITY CRITERIA

Students enrolled for the B. Chem. Engg. / B. Tech. programmes of the Institute of Chemical Technology and have passed the Sem-I and Sem-II examinations are eligible for the admission to minor degree in Management.

F. PREREQUISITES

1. The candidate must have passed the HSC/EQUIVALENT examination with Mathematics and Statistics
2. The candidate must have passed the Communication Skills Course in Year-1 of BChemEngg and BTech Programmes of **the Institute of Chemical Technology, Mumbai.**

In case the candidate wishes to opt for the minor degree in Management but does not meet the prerequisites, he/she will have to acquire the same by successfully completing equivalent courses and providing evidence for the same to the academic office.

G. PEDAGOGY/TEACHING METHOD

Method Of Delivery
<ul style="list-style-type: none"> • Lecture mode • Reading articles • Group Discussions • Case studies Analyses and problem solving using live situations

- Group projects
- Corporate/Industry case studies critical reviews (failure and success)
- Expert talks to demonstrate industry-academia interface
- Role plays
- Article/movies/documentaries/eminent speeches' analyses
- Drafting research proposals
- Term papers/Publishable Research Papers

H. EVALUATION

Level	OUTCOMES	VERB USED	EXAMPLES OF ASSESSMENT	VARIABLE BEING EVALUATED
Remembering	Can the student recall /remember the imparted information	Recall, Recognize, Identify,	Fill in the blanks, Match the columns, Labelling	Ability of student to: recall or recognize terms, facts, and concepts
Understanding	Can the student explain ideas or concepts?	Interpret, Exemplify, Classify, Summarize , Infer, Compare, Explain	Class Activities (team/ individual) Newspapers/ magazine articles' Documentaries, short movies, eminent speeches Quantitative problems Class discussions Concept maps Poster making to link concepts	Ability of student to: -Summarize readings, documentaries, or speeches -Comprehend the similarities and differences between two or more theories, events, or processes -Classify or categorize cases, elements, or events using established criteria -Paraphrase documents or speeches -Introspect and identify personal or established examples or illustrations of a concept or principle
Applying	Can the student use the information in a new way?	Apply Execute Implement	Activities such as problem sets, performances, labs, prototyping, or simulation, solving case studies	Ability of students to use: -Procedures to solve or complete familiar or unfamiliar tasks -Determine which procedure(s) are most appropriate for a given task
Analyzing	Can the student distinguish between the distinct parts?	Analyze Differentiate Organize Attribute	Activities such as case studies, critiques, labs, papers, projects, debates, or concept maps	Ability of students to: -Discriminate or select relevant and irrelevant parts -Determine how elements function together -Determine bias, values, or underlying intent in presented material

Evaluating	Can the student justify / reason out a stand or decision?	Evaluate Check Critique Assess	Activities such as journals, diaries, critiques, problem sets, product reviews,	Ability of students to test, monitor, judge, or critique readings, performances, or products against established criteria or standards
Creating	Can the student create a new product or point of view?	Create Generate Plan Produce Design	Activities such as research projects, musical compositions, essays, business plans, website designs,	Ability of students to: -Make, build, design, or generate something new -Make new integrated marketing communication campaigns -Designing role structures/appraisals for various levels of the system

I. INSTRUCTORS(Tentative)

Dr Rama Iyer: COORDINATOR

Course	Faculty
Organization Behaviour and Human Resource Management Courses	Dr Ramajanaki Iyer
Fundamentals of Marketing and Marketing Research	Mr. Rajesh Ramaswamy
Operations and Supply Chain Management	Mr. Nitin Gokarn

DETAILED SYLLABUS

	Course Code: MGT1101	Course Title: Organizational Behaviour	Credits = 2		
			L	T	P
	Semester: III	Total contact hours: 30	2		
List of Prerequisite Courses					
	None				
List of Courses where this course will be prerequisite					
	1) Interpersonal Processes and Human Resource and Management (MGT 1103) 2) Fundamentals Of Marketing Management and Market Research (MGT 1104)				
Description of relevance of this course in the Bachelor's Program					
This course equips Chemical engineers and Technologists with essential skills for effective communication, collaboration, and stress management. Understanding self-awareness, interpersonal dynamics, attitudes, and motivations enhances job satisfaction and productivity. Moreover, learning time management techniques helps maintain resilience amidst demanding workloads in academic and corporate careers					
	Course Contents (Topics and subtopics)				Reqd. hours
1	Self-Awareness The Johari Window exercise for self-awareness and interpersonal understanding				3
2	Personality, Perception and Attribution Personality and organizations, Social perception and impression management, Attributions in organizations				6
3	Attitudes and Emotions at Work ABC model, Cognitive dissonance, Job satisfaction, Organization citizenship and work deviance, Persuasion and attitude change				6
4	Motivation at Work Classification of drives, Theory X and Theory Y, Maslow's theory Herzberg's two factor theory, Adam's equity theory, The four-drive model				6
5	Stress and Well-being at Work What is stress? Approaches to stress, The stress response, Sources of work stress				6
6	Time Management (HBR article analysis)				3
List of Textbooks					
	1. Organizational Behavior(9e) --by Steven L. McShane (Author), Mary Ann Von Glinow 2. Organizational Behaviour(18e) -Stephen P. Robbins , Timothy A. Judge, Neharika Vohra				
List of Additional Reading Material / Reference Books					
	1. Organizational Behavior (13e)-Mary Uhl-Bien, John R. Schermerhorn Jr., Richard N. Osborn, Wiley India 2. Organizational Behavior and Evidence-Based Approach(12e)- Fred. Luthans. 3. Select Harvard Business Review articles				

Course Outcomes (students will be able to...)		
CO1	Student would be able to describe individual differences and their importance in organizational behaviour	K2
CO2	Student would be able to explain how personality influences behaviors in organizations	K2

CO3	Student would be able to define social perception and explain factors that affect it	K1
CO4	Student would be able to explain how attitudes are formed and importance of emotions at work	K2
CO5	Student would be able to understand the basics of motivation	K1
CO6	Student would be able to explain stress, causes and consequences of stress in organizations	K2

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	0	3
CO2	3	2	1	0	3
CO3	3	2	1	0	3
CO4	3	2	1	0	3
CO5	3	2	1	0	3
CO6	3	1	1	0	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

K,

	Course Code: MGT1102	Course Title: Principles of Management and Organization Structures	Credits = 2		
			L	T	P
	Semester: IV	Total contact hours: 30	2		
List of Prerequisite Courses					
None					
List of Courses where this course will be prerequisite					
	1. Fundamentals Of Marketing Management and Market Research(MGT 1104)				
	2. Interpersonal Processes and Human Resource Management (MGT1103)				
Description of Relevance of this course in the Bachelor's Program					
This course offers Chemical engineers and Technologists insights into navigating business environments, understanding management theories for effective leadership and fostering inclusive work cultures. These skills are essential for addressing complex challenges and driving innovation in the field.					
	Course Contents (Topics and subtopics)				Reqd. hours
1	Business Environment Microenvironment, Macro environment, PESTLE analysis				4
2	Introduction to Key Management Theories Taylor theory, Fayol's fourteen principles, Weber's bureaucracy, Hawthorne experiments				5
3	Skills, Levels of Management and Managerial Roles Technical, Human, Conceptual skills, Levels of management in an organization, Mintzberg's managerial roles				6

4	Organization Structures Functional structure, Product structure, geographical structure, Overview of matrix structure, Organic and Mechanical structures	6
5	Organizational Culture Levels of culture, Artifacts, Stories, Rituals, Symbols, Assumptions and values	5
6	Diversity And Inclusion (Class Assignment)	4
List of Textbooks		
	1. Management(15e)-Robbins 2. Essentials Of Management (11e)-Koontz	
List of Additional Reading Material / Reference Books		
	Management(6e)-Stoner and Freeman	
	Select Harvard Business Review articles	
Course Outcomes (students will be able to...)		
CO1	Student would be able to understand how organizations operate in any milieu	K2
CO2	Student would be able to explain and assess the various micro and macro factors that affect business	K3
CO3	Student would be able to explain the various organizational structures	K2
CO4	Student would be able to gain an understanding of the hierarchy in any organization and skills required	K2
CO5	Student would be able to understand the culture of an organization and the ways in which culture gets communicated	K3

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	0	2	1	3
CO2	0	0	2	1	3
CO3	0	0	3	1	3
CO4	0	0	3	1	3
CO5	0	2	2	1	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

Course Code: MGT1103	Course Title: Interpersonal Processes and Human Resource Management	Credits = 4		
		L	T	P
Semester: V	Total contact hours:60	2	2	
List of Prerequisite Courses				
1) Organizational Behaviour (MGT 1101) 2) Principles of Management and Organizational Structures (MGT1102)				
List of Courses where this course will be prerequisite				
Fundamentals Of Marketing Management and Market Research (MGT 1104)				
Description of relevance of this course in the Bachelor's Program				

This course is invaluable to chemical engineers and technologists, providing essential skills in communication, teamwork, decision-making, leadership, conflict resolution, Human resources management, performance management, change adaptation and knowledge utilization. These interdisciplinary insights empower engineers to adjust and navigate easily the complexities of corporate career and excel in their dynamic field

	Course Contents (Topics and subtopics)	Reqd. hours
1	INTERPERSONAL COMMUNICATION Interpersonal communication model, Barriers and Gateways to communication, Defensive and non-defensive communication, Nonverbal communication	5
2	WORK TEAMS AND GROUPS Group behavior, Group formation and growth, Factors influencing group effectiveness, Upper echelons	4
3	DECISION MAKING Models of decision making-rational model, Bounded rationality model, Escalation of commitment, Individual influences on decision making Group decision making process	5
4	POWER AND POLITICS Concept of power, Sources of power, Symbols of power, Political behavior in organizations, Managing political behavior in organizations	3
5	LEADERSHIP Leadership versus management, Leadership grid, Situational leadership model, Some recent leadership theories	3
6	CONFLICT MANAGEMENT Importance of conflicts, Functional versus dysfunctional conflicts Sources of conflict in organizations, Thomas Kilmann Conflict resolution model	5
7	INTRODUCTION TO HRM Porter's value chain, HRM and importance in the organization	5
8	RECRUITMENT AND SELECTION Recruitment philosophies, Recruitment process, Selection method	8
9	PERFORMANCE MANAGEMENT Goal setting by MBO, Performance appraisal methods, Performance review process, Errors in appraisals	8
10	CHANGE MANAGEMENT Types of change, Olmosk pure strategies, Lewin three stage change process, Force field analysis	8
11	KNOWLEDGE MANAGEMENT (HBR ARTICLE ANALYSIS)	6
List of Textbooks		
	1. Management(6e)-Stoner and Freeman 2. Essentials Of Management (11e)-Koontz 3. Human Resource Management (15e) - Gary Dessler, Biju Varrkey	
List of Additional Reading Material / Reference Books		
	1. Select Harvard Business Review articles	
	2. Human Resource Management(13e)-Susan L. Verhulst, David A. DeCenzo, Rama Shankar Yadav	
Course Outcomes (students will be able to...)		
CO1	Describe the interpersonal communication process, barriers to communication and the impact of non-verbal communication	K1

CO2	Describe how groups are formed and the factors that determine the effectiveness of a group	K3
CO3	Identify steps in the decision-making process	K4
CO4	Describe concept of power and identify ways to manage political behavior in organizations	K4
CO5	Understand the various human resources management processes in an organization	K2

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	3
CO2	3	3	3	1	3
CO3	3	3	2	1	3
CO4	3	3	3	1	3
CO5	3	3	3	1	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

	Course Code: MGT1104	Course Title: Fundamentals of Marketing Management and Market Research	Credits = 2		
			L	T	P
	Semester: VI	Total contact hours: 30	2		
List of Prerequisite Courses					
<ul style="list-style-type: none"> • Organization Behaviour (MGT1101) • Principles of Management and Organization structures(MGT1102) • Communication skills from the foundation first year of BChem or BTech() 					
List of Courses where this course will be prerequisite					
Operations and Supply Chain Management (MGT 1106)					
Description of Relevance of this Course in the Bachelor's Program					
Chemical engineers and technologists would benefit from this course by understanding marketing knowledge to promote and position their products effectively. Understanding consumer behaviour, market research and industry specific techniques helps them tailor products, set prices and target markets in the competitive chemical industry.					
	Course Contents (Topics and subtopics)				Reqd. hours
1	INTRODUCTION TO MARKETING MANAGEMENT Nature and scope, Marketing concepts, Marketing environment				5
2	CONSUMER BUYING DECISIONS Consumer buying decision process, Basics of segmenting, targeting, and positioning				5
3	THE MARKETING MIX OVERVIEW Product, Price, Promotion, Place				6
4	INTRODUCTION TO MARKET RESEARCH Types of Market Research, Exploratory, Descriptive and Causal Research , Types of Experiments, Validity & Reliability				3
5	DATA COLLECTION AND ANALYSIS				4

	Sampling techniques, Primary Data in Market Research Secondary Data & Scales of Measurement	
6	INDUSTRY ACADEMIA INTERFACE TO UNDERSTAND SOME INDUSTRY SPECIFIC MARKETING TECHNIQUES	7
List of Textbooks		
	1. Principles of marketing(17e)-Philip T. Kotler, Gary Armstrong, et al 2. Market Research Made Easy (2e)-Don Doman Dell Dennison Margaret Doman	
List of Additional Reading Material / Reference Books		
	Market Research Handbook: Measurement, Approach and Practice- Jie Xu Select Harvard Business Review articles	
Course Outcomes (students will be able to...)		
CO1	Demonstrate a conceptual understanding of the fundamental area of marketing management	K2
CO2	Understand the marketing mix and its applications	K2
CO3	Apply and evaluate data collection techniques and analyze data and author a report	K5

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	0	3
CO2	1	3	1	0	3
CO3	3	3	3	3	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

	Course Code: MGT1105	Course Title: Professional Ethics	Credits = 2		
			L	T	P
	Semester: VII	Total contact hours: 30	2		
List of Prerequisite Courses					
	1. Organizational behaviour (MGT1101) 2. Principles of management and organization structures (MGT1102)				
List of Courses where this course will be prerequisite					
	All courses in the University				
Description of relevance of this course in the Bachelor's Program					
Business ethics is essential for chemical engineers and technologists as it provides guidance in decision making, especially regarding environmental impact and impact on various stakeholders. Understanding ethical theories and case studies in marketing, HR and Finance helps ensure responsible and sustainable practices in their field					
	Course Contents (Topics and subtopics)				Reqd. hours
1	BUSINESS ETHICS AN OVERVIEW Principles of personal ethics, Principles of professional ethics What is and what is not ethics				4
2	THEORIES OF ETHICS Psychological egoism, Normative, Utilitarianism				5

3	STAGES OF MORAL DEVELOPMENT Pre-conventional stage, Conventional stage, Post-conventional stage	5
4	THE CONTEMPORARY WORKER Need for workplace ethics, Professional versus personal ethics at workplace, Morality of informed consent, Conflict of interest, Whistleblowing	5
5	ENVIRONMENTAL ETHICS Case studies	5
6	ETHICS IN BUSINESS –MARKETING, HR, AND FINANCE Case studies	6
List of Textbooks		
	1. Business Ethics and Corporate Governance(2e)- Fernand 2. Business Ethics- Andrew Crane and Dirk Matten	
List of Additional Reading Material / Reference Books		
	1. Select Harvard Business Review articles 2. Business case studies from leading newspapers and business magazines	
Course Outcomes (students will be able to...)		
CO1	Student would be able to gain an understanding of ethical issues in an organization and daily life	K2
CO2	Student would be able to explain the situation of an ethical dilemma and an overview of resolving the same	K5
CO3	Student would be able to gain an insight into various cases in ethics in different fields and the outcomes of the same	K5
CO4	Student would be able to analyze dilemmas from various cases and apply the same to their working life	K5

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	3	3
CO2	3	1	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution

	Course Code: MGT1106	Course Title: Operations and Supply Chain Management	Credits = 2		
			L	T	P
	Semester: VIII	Total contact hours: 30	2		
List of Prerequisite Courses					
	1) HSC /Equivalent Maths				

	2) Fundamentals of Marketing Management and Marketing Research (MGT 1104)	
List of Courses where this course will be prerequisite		
	None	
Description of relevance of this course in the Bachelor's Program		
This course is highly relevant for chemical engineers and technologists as it covers essential topics like supply chain management, inventory control, production planning, materials requirements planning, distribution channels, purchasing, and operations management. Understanding these concepts is crucial for chemical engineers to optimize production processes, minimize costs, ensure timely delivery of products and maintain competitiveness in the market		
	Course Contents (Topics and subtopics)	Reqd. hours
1	BUSINESS PROCESS IN A TYPICAL MFG. INDUSTRY – OVERVIEW Explain the sequence of a Supply Chain end to end process Importance of Demand Forecasting and bullwhip effect Numerical Measurement of Forecast accuracy	5
2	INVENTORY MANAGEMENT – CONCEPTS, REASONS, SAFETY STOCKS, MEASUREMENT AND TECHNIQUES Importance of Inventories – Concepts, ABC analysis numerical example. Objectives of Inventory management and how to measure and cost inventories Numerical computation of holding the right amount of Inventory – Economic Order Quantity	5
3	PRODUCTION PLANNING AND CONTROL Distinct types of Production Processes How to create a Production Plan with numerical examples Breaking up of a Master Production Plan into weekly schedules and why	5
4	MATERIALS REQUIREMENTS PLANNING What is Material Explosion Initiate a Purchase Order to meet Production Plan – Numerical example of a Production schedule based on M R P	5
5	DISTRIBUTION CHANNELS AND THEIR COSTING Modes of distribution and Transportation management How to decide monetary terms for appointing a Distributor or a C and F agen, How to decide a Transporters contract between two destinations for a Cold Chain product	5
6	PURCHASING AND OPERATIONS MANAGEMENT Capacity Planning with numerical examples, Make or Buy Purchase Orders, Value Analysis and Cost control Computation of GST and its numerical applications – Case study	5
List of Textbooks		
	1. Operations and Supply Chain Management(8e)- Russel , Taylor 2. Operations and Supply Chain Management (15e)- Richard B. Chase, Ravi Shankar, et al.	
List of Additional Reading Material / Reference Books		
	1. Supply Chain Logistics Management (4e)- Bowersox 2. Operations and Supply Chain Management with MindTap- David A. Collier/James R. Evans	
Course Outcomes (students will be able to...)		

CO1	Students will be able to develop an understanding of the importance of logistics in the formulation of the business strategy and the conduct of supply chain operations	K2
CO2	Students will develop an understanding of logistics operating areas and their inter-relationship.	K4
CO3	Students will be able to strengthen integrative management analytical and problem-solving skills	K5

Mapping of Course Outcomes (COs) with Programme Specific Outcomes (PSOs)					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	2	3	1	0
CO2	0	2	3	1	0
CO3	0	2	3	1	0

3, Strong Contribution; 2, Moderate Contribution; 1, Low Contribution; 0– No Contribution