



INDEX

Sr. No	Name of Open Elective	Offering Department	Page No.
1.	Supply Chain Management	Automation and Robotics	1
2.	Road Safety and Civic Responsibilities	Artificial Intelligence & Data Science	5
3.	Mechanical, Electrical and Plumbing System	Civil Engineering	9
4.	Financial Literacy and Investment Planning	Computer Engineering	13
5.	Cyber Security and Laws	Information Technology	18
6.	Business Analytics	Electronics and Telecommunication Engineering	23
7.	Principles and Practices of Management	Mechanical Engineering	27
8.	Project Management	Electrical Engineering	31
9.	Leadership and Organizational Behavior	Electronics and Computer Engineering	35

Jain

R. Jain



Program:	S. Y. B. Tech.			Semester:	III		
Course:	Supply Chain Management			Course Code:	R25-AR-OEC-205		
Teaching Scheme				Examination Scheme			
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR
2	--		2	40	60	--	--
Course Description: This course introduces students to the concepts, functions, and strategies involved in modern supply chains. Topics typically include procurement, inventory management, logistics, transportation, warehousing, demand forecasting, production planning, supplier relationship management, and customer service. Students also learn about global supply chains, digital technologies, sustainability, and risk management in supply chain operations. The course helps students develop analytical, managerial, and decision-making skills required for effective coordination of supply chain activities in manufacturing and service industries.							
Course Relevance: Supply Chain Management (SCM) is an important subject because it helps organizations manage the movement of raw materials, products, information, and finances efficiently from suppliers to customers. In today’s competitive and global market, industries depend on effective supply chains to reduce costs, improve product quality, and deliver goods on time. SCM is highly relevant in manufacturing, automobile, retail, healthcare, e-commerce, food processing, and service industries. Proper supply chain management increases customer satisfaction, minimizes wastage, improves inventory control, and enhances overall business performance. SCM helps organizations coordinate suppliers, manufacturers, warehouses, transportation systems, and retailers effectively. With the growth of technologies such as Artificial Intelligence (AI), Internet of Things (IoT), automation, ERP systems, and e-commerce platforms, supply chain operations are becoming smarter and faster. Therefore, knowledge of SCM is essential for engineers, managers, entrepreneurs, and logistics professionals.							
Prerequisite: Basics of Management, Fundamentals of Operations Management, Mathematics and Statistics, Information Technology, Logistics and Transportation							
Bridge Content: This course typically focuses on bridging the gap between theoretical knowledge and practical, industry-relevant skills in automation technologies.							
Course Objectives: 1. To impart basic skills of supply chain management. 2. To understand the role of Inventory Management in SCM. 3. To learn the concept of IT in supply chain with case studies 4. To Learn concept of Reverse Supply Chain 5. To learn concept of Agile Supply Chain –Different case studies.							
Course Outcomes: After learning the course, students will be able to							
CO	Course Outcome						Bloom’s Level
CO1	UNDERSTAND the fundamentals, concepts, and importance of Supply Chain Management in modern industries.						2
CO2	ANALYZE supply chain components such as procurement, inventory, transportation, warehousing, and distribution systems.						2
CO3	APPLY forecasting, inventory control, and logistics management techniques for effective supply chain operations.						3
CO4	EVALUATE supplier selection, purchasing strategies, and customer relationship management practices.						2



Course Content			
Unit 1	Introduction to supply chain management	8 Hrs.	CO1, CO2
Introduction, Generic Types of supply chain, Various Definitions and Implications, Major Drivers of Supply chain. Strategic Decisions- in Supply Chain Management Introduction, Business Strategy, Core Competencies in Supply Chain, Strategic SC Decisions, Customer Relationship Management Strategy, Supplier Relationship Management Strategy. Source of Management in Supply Chain Introduction, Elements of Strategic Sourcing, A Collaborative Perspective, Development of Partnership. Exemplars / Practical Applications and usage: A mobile phone company procures electronic components from different countries, assembles phones in factories, stores them in warehouses, and delivers them to retailers and customers. Indian Oil Corporation operates continuous production and distribution systems for fuel supply.			
Unit 2	Inventory Management in Supply Chain	7 Hrs.	CO2, CO3
Introduction, Types of Inventory, Supply/ Demand Uncertainties, Inventory costs, Selective Inventory Control, Vendor Manage Inventory system, Inventory Performance Measure Logistics In Supply Chain Management Introduction, Strategy, Transportation Selection, Trade-off, Models for Transportation and Distribution, Third Party Logistics, Overview of Indian Infrastructure for Transportation Exemplars / Practical Applications and usage: DMart uses inventory management systems to maintain product availability and reduce wastage. Amazon uses automated inventory tracking and smart warehouses for efficient inventory control. Toyota uses JIT inventory management for smooth manufacturing operations.			
Unit 3	Information Technology in Supply Chain	8 Hrs.	CO2, CO3
Introduction, Types of IT Solutions like Electronic Data Inter change (EDI), Intranet/ Extranet, Data Mining/ Data Warehousing and Data Marts, E-Commerce, E- Procurement, Bar Coding Technology. Information System in Supply Chain Introduction, Computer Based Information Systems, Computer Models and Perceptions about ERP, Exemplars / Practical Applications and usage: Companies use information technology to monitor inventory, communicate with suppliers, track shipments, and process customer orders. Amazon uses advanced IT systems for inventory tracking, order processing, and logistics management. Retailers automatically send purchase orders and invoices electronically to suppliers. Employees use internal company networks to access inventory records, production schedules, and reports.			
Unit 4	Reverse Supply Chain	7 Hrs.	CO4
Introduction, Reverse Supply Chain v/s Forward Supply Chain, Types of Reverse Flows, Issues in Management of Reverse Supply Chain, Reverse Supply Chain for Food items, Reverse Logistic and Environment Impact. Integration & Collaborative Supply Chain Introduction, Evolution of collaborative SCM, ERP systems, Efficient Customer response, Collaboration at various levels, Imperatives for Successful Integrative Supply Chains. Exemplars / Practical Applications and usage: Companies collect used, damaged, expired, or recyclable products from customers and return them for repair, recycling, or disposal. Customers return defective products to online shopping companies. Plastic bottles are collected and processed into reusable materials			



Comprehensive Continuous Evaluation (CCE) components for the course:
Course Projects (Perform any Two Mini/Micro Project) 1. Inventory Management System Develop a simple inventory tracking system for a retail shop or warehouse using Excel or software tools to monitor stock levels, reorder quantity, and demand forecasting. 2. Supply Chain Analysis of an Industry Study and analyze the supply chain network of an automobile, food processing, pharmaceutical, or e-commerce company and identify strengths and challenges. 3. Logistics and Transportation Optimization Prepare a project on selecting the best transportation route and mode to reduce delivery cost and time for a company. 4. Warehouse Layout Design Design an efficient warehouse layout for storage and material handling to improve space utilization and reduce movement time. 5. Supplier Selection and Evaluation Compare different suppliers based on quality, cost, delivery time, and reliability using decision-making methods. 6. ERP and Digital Supply Chain Study the use of ERP software, RFID, IoT, or automation technologies in supply chain management.
Textbooks: 1. Supply Chain Management Theories & Practices, R. P. Mohanty, S. G. Deshmukh, Dreamtech Press, 19-A, Anari Road, Daryaganj, New Delhi. 2. Sunil Chopra and Peter Meindl, Supply Chain Management-Strategy Planning and Operation, PHI Learning Pearson Education, 2007. 3. Janat Shah, Supply Chain Management – Text and Cases, Pearson Education, 2009.
Reference Books: 1. Supply Chain Management Strategy, Planning & Operation by Sunil Chopra, Peter Meindl. 2. Total Supply Chain Management by Ron Basu, J. Nevan Wright. 3. Supply Chain Management, Chopra, Pearson. 4. Logistics Engineering and Management, Blanchard, Pearson.
MOOCs Links and additional reading material: 1. NPTEL – Operations and Supply Chain Management 2. edX – Supply Chain Management Courses 3. SWAYAM Portal- https://swayam.gov.in



CO-PO-PSO Mapping											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	1	1	1	1	1	-	1	1	1
CO2	2	3	2	2	2	1	1	-	1	1	2
CO3	2	3	3	2	2	1	1	-	1	1	2
CO4	1	2	2	2	1	1	1	1	2	2	2
CO5	1	2	2	2	3	1	1	-	1	1	2
Avg.	2	3	2	2	2	1	1	1	1	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern								
BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	–	√	–	–	–	√	–
L4	–	–	–	–	–	–	–	–
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

This course serves as a prerequisite for / maps with the following future courses:

Before studying Supply Chain Management, students should have basic knowledge of:

- Fundamentals of business and management
- Basic economics and industrial operations
- Production and manufacturing processes
- Inventory and material management concepts
- Basic mathematics and statistics
- Computer applications and spreadsheet usage

Job Mapping:

Job opportunities that one can get after learning this course:

- Supply chain Automation Engineer
- IoT Engineer for Precision Automation
- Supply chain Robotics Developer
- Drone Operations Specialist
- Supply chain System Designer



Program:	S. Y. B. Tech			Semester:	III		
Course:	Road Safety and Civic Responsibilities			Course Code:	R25-AI-OEC-205		
Teaching Scheme				Examination Scheme			
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR
02	-	-	02	40	60	-	-
Course Description: This course develops discipline, awareness, teamwork, and social responsibility among students. It encourages individuals to become careful road users and active citizens who contribute positively to society. Through practical examples, activities, and discussions, students gain knowledge that helps create safer roads and a more responsible nation.							
Course Relevance: The course is also important for developing good citizenship qualities such as discipline, honesty, cooperation, cleanliness, and respect for laws and public property. It encourages students to participate actively in community welfare and environmental protection. By learning these values at an early stage, students become responsible citizens who can contribute to building a safer, cleaner, and more organized society.							
Prerequisite: Basic understanding of Road safety and civic responsibilities							
Bridge Content: It links theoretical knowledge to real-world solutions for complex social challenges.							
Course Objectives: To enable the students to explore aspects of human society and to acquire the intellectual, communication skills and develop characteristics that encourages personal fulfilment, meaningful professional life and responsible citizenship. 1. Understand the road crash problem in India and the role of engineering. 2. Design safe roads with proper alignment, visibility, traffic control, and crash barriers. 3. Implement safe principles in junction design, including priority control signals, and features for pedestrian and motorcyclist safety. 4. Analyze accidents, assess safety measures, and implement comprehensive road safety programs.							
Course Outcomes: After learning the course, students will be able to							
CO	Course Outcome					Bloom's Level	
CO1	ANALYZE the road safety scenario in India:					3	
CO2	DESIGN safe road elements:					3	
CO3	APPLY safe junction design principles					3	
CO4	IMPLEMENT and evaluate road safety measures					3	
Course Content							
Unit 1	Introduction to Road Safety				7 Hrs.	CO1	
Road Safety Scenario in India: Road crashes, causes, and consequences; Road Safety Engineering: Measures for crash prevention and reduction; Introduction to Crash Recording and Analysis: Data collection and analysis techniques.							
Exemplars / Practical Applications and usage: Activity on Road Safety and Civic Responsibilities for daily life.							



Unit 2	Planning for Road safety	8 Hrs.	CO2
Awareness about rules and regulations of traffic. Assisting Traffic control authorities. Multidisciplinary approach to planning for traffic safety and injury control. Vulnerable road users: crashes related to pedestrian and bicyclists, their safety, provision for disabled.			
Exemplars / Practical Applications and usage: Planning for road safety is practically applied through proper road design, installation of traffic signals and signboards, creation of pedestrian crossings and footpaths, use of smart traffic systems.			
Unit 3	Responsibility of Road accidents and Safety measures	7 Hrs.	CO3
People responsible for accident prevention: Police, Politicians, Community members, Policy makers, Teachers, Parents, Infrastructure authorities, Drivers and Official road safety body. Reasons of students/ children have accidents. 4 E's of Accidents Prevention: 1. Engineering - by altering the environment 2. Enforcement - by imposing laws 3. Encouragement - by the use of publicity campaigns 4. Education - by gaining and using knowledge.			
Exemplars / Practical Applications and usage: Rural activity which will be helpful for villagers.			
Unit 4	Road Safety Education	8 Hrs.	CO4
Introduction to Road Safety Education. 5 P's of Road safety education: 1. Preschool road safety education 2. Practical rather than theory education 3. Principles of own development as regards to road safety education 4. Presentations on road safety education 5. Place for road safety education			
Exemplars / Practical Applications and usage: Presentations on road safety education			
Course Projects:			
1. Road Safety Awareness Poster 2. Traffic Signal Model 3. First Aid and Emergency Response Project 4. Civic Responsibility Cleanliness Drive 5. Smart City and Traffic Management Project			
Textbooks:			
1. Highway Engineering – B.S. Rangwala, Charotar Publishing House, 2022. 2. Textbook of Highway and Traffic Engineering – Subhash C. Saxena, CBS Publishers & Distributors, 2023. 3. Transport Planning and Traffic Safety: Making Cities, Roads, and Vehicles Safer – Geetam Tiwari, Dinesh Mohan & Girish Agrawal, CRC Press, 2016. 4. A Textbook of Transportation Engineering – S.P. Chandola, S. Chand Publishing, 2001. 5. Introduction to Traffic Engineering – R. Srinivasa Kumar, OM Publications, 2018. 6. Human Values and Professional Ethics – Jayshree Suresh, S. Chand Publishing, 2003. 7. Professional Ethics (Second Edition) – R. Subramanian, Oxford University Press India, 2017			

**Reference Books:**

1. TRRL OVERSEAS UNIT, 1991. Towards safer roads in developing countries: a guide for planners and engineers. Crow Thorne: Transport and Road Research Laboratory.
2. Indian Roads Congress, Highway Safety Code, IRC: SP-44:1996.
3. Indian Roads Congress, Road Safety Audit Manual, IRC:SP-88-2010.

MOOCs Links and additional reading material:

1. [NPTEL Traffic Engineering Course](#) – Covers traffic management, road safety, parking management, and accident prevention.
2. [NPTEL Corporate Social Responsibility Course](#) – Explains civic responsibility, ethics, and social awareness.
3. [NPTEL Ethics in Engineering Practice](#) – Focuses on professional ethics, public safety, and responsibilities of engineers.
4. [NPTEL Industrial Safety Engineering](#) – Provides knowledge about safety systems, accident prevention, and risk management.
5. [SWAYAM Urban Transportation Systems Planning](#) – Discusses urban transport, traffic planning, and sustainable transportation systems.

CO-PO-PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	2	-	-	-	2	-	-	2	-	-
CO2	-	2	2	-	-	3	2	-	2	-	-
CO3	1	2	2	-	3	2	-	-	2	-	3
CO4	-	3	3	2	-	3	2	2	2	2	3
Avg.	1	2	2	2	3	2	2	2	2	2	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern

BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	√	√	√	√	√	√	√	√
L4	—	—	—	—	—	—	—	—
L5	—	—	—	—	—	—	—	—
L6	—	—	—	—	—	—	—	—



This course serves as a prerequisite for / maps with the following future courses:

1. Community Development and Social Responsibility
2. Smart City and Traffic Systems
3. Environmental Studies.
4. Sustainable Development

Job Mapping:

This course prepares students for roles such as Traffic police officers, road engineers, drivers, civic authority workers, and citizens work together to ensure road safety and promote responsible civic behavior.



Program:	S.Y. B.Tech.				Semester:		III	
Course:	Mechanical, Electrical and Plumbing System				Course Code:		R25-CE-OEC-205	
Teaching Scheme (Hrs./week)				Examination Scheme				
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR	OR
2	-	-	2	40	60	-	-	-
Course Description: This course introduces the fundamental principles, design integration, and installation practices of Mechanical, Electrical, and Plumbing (MEP) systems. It bridges the gap between structural design and building services, focusing on water supply, sanitation, HVAC (Heating, Ventilation, and Air Conditioning), electrical distribution, and fire safety.								
Course Relevance: For a Civil Engineer, MEP knowledge is crucial for coordinating site activities, avoiding structural-service conflicts (clashes), and ensuring sustainable building operations. As the industry moves toward BIM (Building Information Modeling), integrated MEP knowledge is a core competency.								
Prerequisite: - Basic Electrical & Electronics Engineering: Understanding of voltage, current, and power, - Engineering Graphics: Ability to read and interpret 2D plan views and sections, - Fluid Mechanics: Basic concepts of pressure, flow, and head loss (for plumbing), - Physics (Thermodynamics): Basic heat transfer concepts.								
Bridge Content: - Review of fluid pressure and flow in pipes. - Fundamentals of thermal comfort. - Basic electrical circuits and safety grounding.								
Course Objectives: - To familiarize students with the essential mechanical, electrical, and plumbing services required in modern buildings. - To develop the ability to coordinate civil structures with MEP service requirements.								
Course Outcomes: After learning the course, students will be able to								
CO	Course Outcome						Bloom's Level	
CO1	INTERPRET architectural drawings and NBC codes to plan service layouts.						4	
CO2	EVALUATE HVAC and Fire Safety requirements for different building occupancies.						3	
CO3	DESIGN basic electrical load distributions and lighting schemes for indoor spaces.						6	
CO4	CALCULATE water demand and design efficient plumbing and drainage networks.						3	
Course Content								
Unit 1	Title: Introduction to MEP and Building Standards					8 Hrs.	CO1	
The Role of MEP: Importance of MEP services in modern infrastructure; lifecycle of a building project, Coordination and Integration: How Civil, Structural, and MEP engineers collaborate; Introduction to BIM (Building Information Modeling) for clash detection, Regulations and Codes: Overview of the National Building Code (NBC), Design Process: Understanding architectural layouts and MEP symbolic representations.								



Exemplars / Practical Applications and usage: Analysis of a high-rise "mixed-use" building project lifecycle.			
Unit 2	Title: Mechanical Systems - HVAC and Fire Protection	8 Hrs.	CO2
Fundamentals of HVAC: Principles of thermodynamics and heat transfer; Types of HVAC systems (Window, Split, VRF, And Centralized Chilled Water Systems), Ventilation: Natural vs. Mechanical ventilation; Duct design basics; Air Handling Units (AHU), Fire Safety Systems: Fire chemistry; Active vs. Passive fire protection; Fire hydrant systems, sprinklers, smoke detectors, and fire alarms, Mechanical Transportation: Elevators, Escalators, and Moving Walkways—design criteria and structural requirements. Smart Building Technology: Introduction to Building Management Systems (BMS); Automation for lighting and HVAC.			
Exemplars / Practical Applications and usage: Visit to a basement to see Ventilation fans (Jet fans) and Fire Sprinkler networks.			
Unit 3	Title: Electrical Systems and Lighting	7 Hrs.	CO3
Power Distribution: Introduction to High Tension (HT) and Low Tension (LT) power; Substation components (Transformers, Switchgears, Busbars), Wiring and Safety: Types of wiring; Circuit breakers (MCB, RCCB); Earthing and Lightning protection for structures. Illumination Design: Fundamentals of lighting; Types of lamps (LED, Fluorescent); Calculation of Lux levels; Emergency lighting systems, Backup Systems: UPS and Diesel Generators (DG set) sizing and placement considerations. Solar PV integration; Energy auditing basics for Civil Engineers.			
Exemplars / Practical Applications and usage: Sizing a Diesel Generator for a residential apartment complex.			
Unit 4	Title: Plumbing and Sanitary Systems	7 Hrs.	CO4
Water Supply: Sources of water; Cold and Hot water distribution systems; Direct vs. Indirect pumping; Storage tank (UGWT and OHWT) capacity calculations, Sanitation and Drainage: Soil and Waste pipe systems (Single stack, One-pipe, Two-pipe); Traps, Gulley, and Manholes, Fixture Technology: Selection of sanitary ware; Water-efficient fixtures, Rainwater Harvesting: Storm water drainage design; Recharge pits and storage systems for urban civil structures. Grey water recycling.			
Exemplars / Practical Applications and usage: Design of a Rainwater Harvesting system for the college campus.			
Course Projects:			
Software Introduction: A brief 2-hour overview/demo of BIM (Building Information Modeling) software like Autodesk Revit for MEP clash detection.			
Textbooks:			
Journals & Standards • National Building Code (NBC) 2016: Specifically Parts 4 (Fire), 8 (Building Services), and 9 (Plumbing). • ASHRAE Journal: For latest trends in HVAC and thermal efficiency. • CIBSE (Chartered Institution of Building Services Engineers): Guides on lighting and electrical safety.			

**Technical Handbooks**

- Plumbing Design and Practice by S.G. Deolalikar.
- Modern Air Conditioning Practice by Norman C. Harris.
- Handbook of Electrical Design Details by Neil Slater.

Reference Books:

- **National Building Code of India (NBC) - Part 4, 8 & 9:** Bureau of Indian Standards.
- **Building Services:** S.M. Patil, 2nd Edition, Seema Publication.
- **Building Services and Equipment:** Fred Hall and Roger Greeno, Routledge.
- **Mechanical and Electrical Equipment for Buildings:** Walter T. Grondzik and Alison G. Kwok, Wiley.
- **Water Supply and Sanitary Engineering:** S.C. Rangwala, Charotar Publishing House.

MOOCs Links and additional reading material:

Since MEP is a specialized intersection of mechanical, electrical, and civil engineering, these courses provide the necessary cross-disciplinary knowledge:

- **NPTEL:** [Energy Efficiency, Acoustics & Daylighting in Building](#)
- **Coursera:** [Autodesk Certified Professional: Revit for Structural Design](#) (For BIM context).
- **edX:** [Sustainable Building Design](#).

CO-PO-PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	1	-	-	3	2	2	-	2	-
CO2	3	3	3	2	-	3	1	-	1	-	1
CO3	3	2	3	-	-	2	2	-	-	-	-
CO4	3	3	3	2	-	2	3	-	1	-	1
Avg.	3	2.5	2.5	2	-	2.5	2.0	2	1	2	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern

BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	√	√	√	√	√	√	√	√
L4	√	—	√	—	√	—	√	—
L5	—	—	√	—	—	—	√	—
L6	—	—	√	—	—	—	√	—

**This course serves as a prerequisite for / maps with the following future courses:**

This Open Elective acts as a foundation for several advanced specializations and professional electives in your final years and post-graduation:

1. Building Information Modeling (BIM)

Connection: This course is the direct prerequisite for Revit MEP. While Civil Engineering teaches you the "Shell," BIM courses teach you how to populate that shell with data-rich MEP systems.

Key Skill: Virtual design and construction (VDC).

2. Construction Technology & Management (CTM)

Connection: You cannot manage a project schedule without understanding MEP lead times (e.g., HVAC chillers often have a 4-month lead time). This course maps to Project Scheduling & Resource Management.

3. Green Building & Sustainable Architecture

Connection: 70% of a building's energy is consumed by MEP. This course is the prerequisite for LEED/GRIHA Certification courses and Energy Auditing.

4. Advanced Structural Design

Connection: Maps to courses dealing with High-Rise Buildings. You will learn how to design "Service Floors" and "Structural Sleeves" to accommodate massive MEP loads without compromising stability.

Job Mapping:

Job opportunities that one can get after learning this course:

Completion of this course, especially if paired with the Course Project, opens doors to three distinct career "Buckets":

1. Design & Engineering Roles

MEP Design Engineer: Creating the blueprints for water, power, and air systems.

BIM Coordinator (MEP): Using software like Navisworks to perform "Clash Detection" (identifying where a pipe hits a beam before it happens on-site).

Public Health Engineer (PHE): Specializing specifically in large-scale water treatment and sanitation for townships.

2. Site & Execution Roles

MEP Site Engineer: Supervising the installation of conduits, ducts, and pipes. This is a high-demand role in high-rise residential and commercial mall projects.

Quality Control (QC) Engineer - MEP: Ensuring that the materials used (pipes, wires, valves) meet the IS/NBC standards.

Billing & Quantity Surveyor (MEP): Managing the "MEP BOQ" (Bill of Quantities), which often accounts for 30% to 45% of the total project cost?

3. Specialized Industry Roles

Facility Manager: Overseeing the operations of completed buildings (hospitals, data centers, airports) where MEP uptime is critical.

Sustainability Consultant: Helping developers achieve "Net Zero" status by optimizing HVAC and lighting systems.



Program:		S. Y. B. Tech (Computer Engineering)		Semester:	III		
Course:		Financial Literacy and Investment Planning		Course Code:	R25-CO-OEC-205		
Teaching Scheme (Hrs./week)			Credits (TH)	Examination Scheme			
Lectures	Practical	Tutorial		CCE	ESE	TW	PR
2	-	-	2	40	60	-	-
Course Description: This course introduces students to the fundamentals of financial literacy and personal finance, focusing on effective management of income, expenses, and savings. It covers essential topics such as financial planning, budgeting, banking services, digital payments, and emergency funds. The course also provides an understanding of various investment avenues, risk management strategies, and portfolio management techniques for long-term wealth creation. Emphasis is placed on practical applications using real-life case studies and digital financial tools to enable informed financial decision-making in everyday life.							
Course Relevance: This course helps students understand basic financial management skills needed in daily and professional life. It provides knowledge about budgeting, banking, digital payments, investments, and risk management. The course enables students to make better financial decisions, manage money responsibly, and plan for future financial needs effectively.							
Prerequisite: Basic understanding of mathematics (percentages, ratios, and simple calculations).							
Bridge Content: Basic concepts of money management, mathematics for finance, banking fundamentals.							
Course Objectives: 1. To understand the fundamentals of financial literacy and personal finance. — 2. To analyse and apply financial planning and budgeting techniques, including preparation of budgets. 3. To evaluate various investment options and understand risk-return relationships, enabling informed financial decision-making. 4. To design investment portfolios and understand wealth creation strategies.							
Course Outcomes: After learning the course, students will be able to:							
CO	Course Outcome					Bloom's Level	
CO1	EXPLAIN the concepts of financial literacy and personal finance, including income management, budgeting.					2	
CO2	APPLY financial planning principles to prepare personal budgets using appropriate tools and techniques.					3	
CO3	ANALYZE various investment options and risk-return relationships for informed investment decisions.					4	
CO4	DEVELOP a basic investment portfolio for long-term wealth creation and financial growth.					6	

Course Contents



Unit 1	Introduction to Financial Literacy & Personal Finance	8 Hrs.	CO1
Financial Literacy: Meaning and importance of financial literacy, personal finance concepts, Main Components: Income and expenditure management, budgeting, saving habits, banking services, Credit Debit, Insurance, digital payment systems, Emergency Funds, Digital Financial Literacy and their importance.			
Exemplars / Practical Applications and usage: Case Study: Managing Finances of a College Student A second-year engineering student receives a monthly allowance of ₹8,000. Due to frequent online shopping and unplanned expenses, the student struggles to save money and often runs out of funds before the month ends. Tasks: - Identify issues in income and expenditure management. - Suggest a proper budgeting strategy. - Recommend suitable digital payment and saving practices. - Propose an emergency fund plan.			
Assignments: - Explain the importance of financial literacy in personal life and discuss how income, expenditure, and savings can be effectively managed. - Analyze different digital payment systems and banking services and explain their role in promoting a cashless economy.			
Unit 2	Financial Planning & Budgeting	8 Hrs.	CO2
Financial Planning: Objectives and steps, Budgeting: Budget, Importance of Budgeting, Types of Budget, Components of Budget, Needs, Benefits of financial planning and budgeting, Smart Budgeting tips, Principles of budgeting, Tools used in Financial Planning, Role of banks in Budgeting, Digital Budgeting			
Exemplars / Practical Applications and usage: Case Study: Financial Planning for a Young Professional A newly employed software engineer earns ₹35,000 per month. They need to manage rent, food, transport, EMIs, and savings but lack a structured financial plan. Tasks: - Prepare a monthly budget with clear allocation. - Identify financial goals (short-term and long-term). - Suggest budgeting techniques (e.g., 50-30-20 rule). - Recommend digital tools/apps for budgeting.			
Assignments: - Prepare a monthly personal budget for a student or working professional, clearly showing income, expenses, and savings. - Compare different types of budgets (fixed, flexible, zero-based) and evaluate their suitability for various financial situations.			

Unit 3	Investment Avenues & Risk Management	8 Hrs.	CO3
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Investment concepts, Objectives of Investment, Risk management, Methods of Risk management, Types of Financial Risk, Importance of Risk management, risk and return analysis, Features of Good investment, factors affecting investment decision, Short term and long term investment, stocks, bonds, mutual funds, fixed deposits, gold, real estate, post office schemes, diversification, investment decision factors.

Exemplars / Practical Applications and usage:

Case Study: Investment Decision for a First-Time Investor

An individual has ₹1,00,000 to invest and is confused between mutual funds, fixed deposits, and stocks. They are risk-averse but want better returns than a savings account.

Tasks:

- Compare investment options based on risk and return.
- Suggest an appropriate investment plan.
- Explain diversification strategy.
- Identify possible financial risks and mitigation methods.

Assignments:

1. Compare various investment options such as stocks, mutual funds, fixed deposits, gold, and real estate based on risk and return.
2. Explain the concept of diversification and risk management with suitable examples in investment planning.

Unit 4	Portfolio Management & Wealth Creation	8 Hrs.	CO4
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Investment planning process, portfolio management definition, portfolio management basics, Objectives of portfolio management, Importance of Portfolio management, Advantages, Wealth Creation: Objectives, Methods, importance, factors affecting, role of financial planning in wealth creation, SIP and systematic investments, long-term wealth creation, financial market overview, investment strategies, Tax planning in wealth creation, digital investment and portfolio tracking, case studies in financial planning.

Exemplars / Practical Applications and usage:

Case Study: Wealth Creation for Long-Term Goals

A 30-year-old professional wants to build wealth for retirement and children's education. They can ₹10,000 per month but are unsure how to allocate it.

Tasks:

- Design a diversified investment portfolio.
- Suggest allocation using SIP and long-term strategies.
- Explain role of tax planning in wealth creation.
- Recommend digital tools for portfolio tracking.

Assignments:

1. Design a basic investment portfolio for a salaried individual considering risk profile and financial goals.
2. Discuss wealth creation strategies such as SIP, long-term investment, and tax planning with practical examples.

**Textbooks:**

1. Madan Mohan Goyal, “Financial Education and Financial Inclusion”, SAGE Publications India, Latest Edition, 2022.
2. H. R. Machiraju, Indian Financial System, Vikas Publishing House, 5th Edition, 2021.
3. Prasanna Chandra, Investment Analysis and Portfolio Management, McGraw Hill Education, 5th Edition, 2021.
4. National Institute of Securities Markets, Financial Education Workbook, National Institute of Securities Markets, Latest Edition, 2023.
5. S. K. Gupta, A Textbook of Financial Education, Goyal Brothers Prakashan, Latest Edition, 2016.
6. Morgan Housel, “The Psychology of Money” Hariman House
7. John C. Bogle, “The little book of common sense investing”, Wiley Publication

Reference Books:

1. E. Thomas Garman and Raymond Forgue, Personal Finance, Cengage Learning, 13th Edition, 2020.
2. Jack Kapoor, Les Dlabay and Robert J. Hughes, Personal Finance, McGraw Hill Education, 12th Edition, 2019.
3. V. K. Bhalla, Investment Management, S. Chand Publishing, Latest Edition, Year: 2020.
4. Burton G. Malkiel, A Random Walk Down Wall Street, W. W. Norton & Company, 12th Edition, 2019.
5. Peter Lynch, One Up on Wall Street, Simon & Schuster, Latest Edition, 2018.
6. K. G. Karmakar, G. D. Banerjee and N. P. Mohapatra, Towards Financial Inclusion in India, SAGE Publications, 1st Edition, 2011.

MOOCs Links and additional reading material:

1. Behavioral and Personal Finance
<https://elearn.nptel.ac.in/shop/nptel/behavioral-and-personal-finance>
2. RBI Financial Education Resources
<https://www.rbi.org.in/Scripts/FinancialEducation.aspx> Personal Finance & Investments: Money matters: Lets Understand | SEBI Investor |
3. SEBI Investor Education – Personal Finance & Investments: <https://www.ncfe.org.in>
4. National Centre for Financial Education (NCFE)
[NCFE Important Financial Links & Resources](https://www.ncfe.org.in)
5. Zerodha Varsity – Complete Finance Learning Modules: <https://zerodha.com/varsity/modules/>
6. Behavioral Finance: <https://www.coursera.org/courses?query=behavioral+finance>
7. Income Tax Department – Taxpayer Help and Guidance
<https://www.incometax.gov.in/iec/foportal/help/all-topics>

Strength of CO-PO-PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	1	-	-	2	1	2	-	2	1	1	-	1	2
CO2	2	2	1	1	2	1	2	-	2	2	2	-	2	3
CO3	2	3	2	2	2	1	2	-	2	2	3	1	2	3
CO4	2	3	3	2	2	2	2	1	2	2	3	1	2	3
Avg.	2	2.3	2	1.7	2	1.3	2	1	2	1.8	2.3	1	1.8	2.8



1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern							
BT Level	CCE						ESE
	CT1	CT2	Assignments	Course Project	Field Activity / Case Study	Quiz / presentation etc.	
K1	✓	-	✓	-	-	-	✓
K2	✓	-	✓	-	-	✓	✓
K3	-	-	✓	✓	✓	✓	✓
K4	-	-	✓	✓	-	-	-
K5	-	-	✓	-	-	-	-
K6	-	-	-	-	-	✓	-

This course serves as a prerequisite for / maps with the following future courses:

This course provides a strong foundation in financial literacy, investment planning, budgeting, and wealth management concepts. The knowledge gained in this course supports future courses such as Financial Management, Entrepreneurship Development, Business Analytics, FinTech, Banking and Insurance, Investment Analysis, Portfolio Management, Digital Economy, and Financial Technology Applications. The concepts of financial planning, risk management, and investment strategies also help students understand emerging areas like Digital Banking, Financial Data Analytics, and AI-driven financial systems.

Job Mapping:

The knowledge gained from this course is valuable for careers requiring financial awareness, analytical thinking, and investment decision-making skills. It prepares students for job roles such as Financial Analyst, Investment Advisor, Banking Associate, FinTech Executive, Insurance Consultant, Wealth Management Advisor, Risk Management Analyst, Business Consultant, Digital Payment Systems Executive, and Entrepreneurial or Startup-related roles involving financial planning and management.



Program:	S. Y. B. Tech.	Semester:	III
Course:	Cyber Security and Laws	Course Code:	R25-IT-OEC-205
Teaching Scheme			
Lecture	Practical	Tutorial	Credit
02	--	--	02
Examination Scheme			
CCE	ESE	TW	PR
40	60	--	--

Course Description

The Cyber Security and Laws course is designed to provide students with comprehensive knowledge of cybersecurity principles, cyber threats, security mechanisms, and legal frameworks governing cyberspace. The course introduces fundamental concepts of information security, network security, cryptography, ethical hacking, cybercrime, digital forensics, and emerging security models such as Zero Trust Architecture. It covers various cyber threats including malware, phishing, ransomware, denial-of-service attacks, identity theft, and social engineering attacks, along with preventive and defensive security measures.

Course Relevance:

The Cyber Security and Laws course is highly relevant in the modern digital era where organizations, governments, and individuals increasingly rely on interconnected systems, cloud platforms, mobile technologies, and online services. With the rapid growth of cyber threats such as phishing, ransomware, data breaches, identity theft, and social engineering attacks, there is a growing demand for professionals who understand both technical security measures and legal compliance requirements.

Prerequisite:

Basic knowledge of Computer Fundamentals and Internet

Bridge Content:

- Common Cyber Threats and Attacks
- Password Security and Authentication Techniques
- Safe Internet Browsing and Email Security

Course Objectives:

1. To understand cybersecurity concepts, threats, attacks, and security principles.
2. To apply authentication, access control, encryption and network security practices.
3. To understand cybersecurity frameworks, firewalls, cryptography, data privacy and zero trust architecture.
4. To develop awareness of cyber laws, cybercrime, ethical hacking, digital forensics and responsible digital behavior.

Course Outcomes: After learning the course, students will be able to

CO	Course Outcome	Bloom's Level
CO1	DESCRIBE cybersecurity concepts, cyber threats and cyber-attacks	2
CO2	DEMONSTRATE Cyber Crimes, Cyber Safety and Zero Trust Architecture	3
CO3	APPLY Tools and Technology for Cyber Security	3
CO4	ANALYZE cybercrime cases, national and International Cyber Law Policies	4

Course Contents

Unit 1	Introduction to Cyberspace and Cyber Threats	7 Hrs.	CO1
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Cyberspace and Digital Society, Evolution of Internet and Digital Communication, Components of Cyberspace, Cyber Safety versus Cyber Security, Importance of Cyber Hygiene, Digital Footprint and Digital Identity, Risks in Digital Environments, Overview of cyber threats and vulnerabilities, Malware: virus, worms, trojan horses,



ransomware , Phishing and social engineering attacks, Identity theft and cyber fraud, Password attacks and brute force attack , Denial of Service (DoS) and DDoS attacks, Case studies of cyber incidents

Exemplars/Case studies/Practical Applications and usage:

1. Social Media Data Leak and Digital Footprint

Study of personal data leakage through social media platforms and analysis of risks associated with digital footprints and online identity exposure.

2. WannaCry Ransomware Attack

Analysis of the global ransomware attack, malware propagation techniques, vulnerabilities exploited, and preventive cybersecurity measures.

Unit 2	Cyber Crimes and Cyber Safety	8 Hrs.	CO2
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Cyber Crime: Definition of Cyber Crime and Computer related Crimes, Classification and Differentiation between traditional crime and cybercrimes, Types of Cyber Crimes: Data Theft, Hacking, Spreading Virus and Worms, Phishing, Cyber Stalking/Cyberbullying, Identity Theft and Impersonation, Credit card and Online Banking Frauds, online harassment, Mobile device security threats, Secure use of mobile applications and app permissions, Cyber terrorism, Cybercrime Scenario in India

Cyber Safety : Role of cyber safety in modern digital applications: Cyber safety in e-commerce, e-banking and e-governance systems, Password management and authentication methods, multi-factor authentication, Safe internet browsing practices, Email security and phishing detection, Privacy risks in social media platforms, Managing digital reputation and online identity, Cloud security awareness, AI techniques for threat detection and fraud detection, Machine learning for malware and phishing detection, AI-based intrusion detection systems, Zero Trust Architecture in Modern Cyber Security and Digital Laws

Exemplars/Case studies/Practical Applications and usage:

1. Cyberbullying and Digital Reputation on social media

Study of online harassment cases, misuse of social media platforms, privacy concerns, and legal implications under cyber laws.

2. Online Banking Fraud through Phishing Attack

Analysis of phishing-based financial fraud, credential theft techniques, and preventive mechanisms such as multi-factor authentication and secure browsing.

Unit 3	Tools & Technology for Cyber Security	7 Hrs.	CO3
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Firewall Technologies, Intrusion Detection Systems (IDS), Intrusion Prevention Systems (IPS), Network Scanners and Vulnerability Assessment Tools, Antivirus and AntiMalware Software, Mobile Device Management (MDM) Tools, Data Loss Prevention (DLP) Solutions, Full Disk Encryption, File and Folder Encryption, Automated Incident Response Platforms, Web Application Firewalls security tolls, Runtime Application Self-Protection (RASP), Artificial Intelligence (AI) and Machine Learning (ML) in Security, Deception Technologies, Cloud Security Tool

Exemplars/Case studies/Practical Applications and usage:

1. Mobile Application Data Leakage Case

Study of security vulnerabilities in mobile applications, unauthorized permission access, and protection mechanisms for mobile devices.

2. Intrusion Detection and Firewall Protection in Enterprise Networks

Analysis of firewall technologies, IDS/IPS systems, and network monitoring tools used to detect and prevent cyber-attacks.



Unit 4	Cyber Laws	8 Hrs.	CO4
Cyber Laws: Introduction to Cyber Laws, Objectives, Scope and Amendments, Role of Law Enforcement, The legal perspectives-Indian perspective- IT Act 2000, Cybercrime Cases in India: Analysis and Legal Consequences, Categories of Cybercrime, Cyber Law and E-Governance, Right to Privacy and Data Protection Laws, CERT-In (Indian Computer Emergency Response Team) International Cyber Law Policies: Role of Organization: The United Nations (UN), ICANN (Internet Corporation for Assigned Names and Numbers), Cyber Warfare and International Treaties, Ethical Challenges in AI and IoT Security, General Data Protection Regulation (GDPR), Health Insurance Portability and Accountability Act (HIPAA), Children's Online Privacy Protection Act (COPPA), Case Studies on Cross-Border Cybercrime Exemplars/Case studies/Practical Applications and usage: Credit Card Fraud Detection and Legal Investigation Study of digital payment fraud cases, cybercrime investigation procedures, and legal consequences under the Information Technology Act. IoT Security Breach and DDoS Attack Analysis of IoT-based cyber-attacks, ethical concerns, international cybersecurity policies, and data protection regulations. Textbooks: - Pfleeger, Charles P., Shari Lawrence Pfleeger, and Lizzie Coles-Kemp, Security in Computing, 6th ed., 2023, Pearson Education. ISBN 978-0137891214. - Kosseff, Jeff, Cybersecurity Law. 3rd ed., 2023, Wiley. ISBN 978-1119822165. - Kaushik, Keshav, and Ishu Sharma, editors, Next-Generation Cybersecurity: AI, ML, and Blockchain. 1st ed., 2024, Springer. ISBN 978-981-97-1249-6. - Shrivastava, Gulshan, Rudra Pratap Ojha, Shashank Awasthi, Kavita Sharma, and Himani Bansal, Emerging Threats and Countermeasures in Cybersecurity. 1st ed., 2024, Wiley-Scrivener. ISBN 978-1394230570. Reference Books: - Kosseff, Jeff, Cybersecurity Law, John Wiley & Sons, 3rd edition, 2023, ISBN: 1119822165. - Kaur, Gagandeep, Narendra N. Dalei, and Sushanta Kumar Mahapatra, Cybersecurity, Law, and Economics: The Case of India, Routledge, 1st edition, 2024, ISBN: 1032852453. - Segura Serrano, Antonio, Global Cybersecurity and International Law, Routledge, 1st edition, 2024, ISBN: 1032382317. - Kaiwartya, Omprakash, Keshav Kaushik, and Sachin Kumar Gupta, editors, Security and Privacy in Cyberspace, Springer, 1st edition, 2023, ISBN: 9811919623. Website Links/ Online Resources Cyber Security Course – By Prof. Debdeep Mukhopadhyay, IIT Kharagpur https://onlinecourses.nptel.ac.in/noc21_cs45/preview Introduction to Cyber Security – Cisco Networking Academy https://www.netacad.com/courses/cybersecurity/introduction-cybersecurity Ethical Hacking – By Prof. Indranil Sengupta, IIT Kharagpur https://onlinecourses.nptel.ac.in/noc22_cs90/preview IIT Virtual Labs – Information Security Lab https://cse29-iiith.vlabs.ac.in/			



5. OWASP Web Security Testing Guide – OWASP Foundation
<https://owasp.org/www-project-web-security-testing-guide/>
6. National Cyber Crime Reporting Portal – Government of India
<https://cybercrime.gov.in>
7. CERT-In (Indian Computer Emergency Response Team) – Cyber Security Guidelines and Alerts
<https://www.cert-in.org.in>
8. SANS Cyber Aces Online – Cybersecurity Training
<https://www.cyberaces.org>

CO-PO-PSO mapping											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	1	1	-	1	-	1	-
CO2	2	3	1	1	2	-	-	1	1	1	-
CO3	2	2	1	-	2	1	-	2	2	2	-
CO4	3	3	2	2	2	1	-	1	1	1	-
CO4	2	2	1	1	2	2	-	3	2	2	1
Avg.	2.4	2.4	1.25	1.33	1.8	1.25	-	1.6	1.5	1.4	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern								
BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	√	√	√	–	√	√	√
L4	–	–	–	√	–	–	–	√
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

This course serves as a prerequisite for maps with the following future courses:

- Ethical Hacking and Penetration Testing
- Network Security and Cryptography
- Digital Forensics and Cyber Crime Investigation
- Cloud Security and Secure Distributed Systems
- Artificial Intelligence in Cybersecurity
- Mobile and Wireless Network Security



Job Mapping:

Job/Future opportunities that one can get after learning this course:

- Information Security Analyst
- Ethical Hacker / Penetration Tester
- Digital Forensics Investigator
- Cloud Security Specialist
- Cyber Law and Compliance Officer
- Security Consultant
- Network Security Engineer
- Security Auditor
- Cybercrime Investigation Officer



Program:	S. Y. B. Tech.			Semester:	III		
Course:	Business Analytics			Course Code:	R25-ET-OEC-205		
Teaching Scheme				Examination Scheme			
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR
02	--	--	02	40	60	--	--
Course Description: Business Analytics is a subject that focuses on the use of data, statistical methods, and analytical techniques to support effective decision-making in business organizations. It helps students understand how to collect, organize, analyze, and interpret data to solve real-world business problems. The subject introduces important concepts such as data visualization, trend analysis, regression analysis, forecasting, customer segmentation, and predictive modeling. For second year students, Business Analytics develops analytical thinking, problem-solving ability, and technical skills required in modern industries.							
Course Relevance:- Business Analytics is highly relevant for students because it helps them develop the ability to make informed and data-driven decisions in today’s technology-oriented world. In modern industries, organizations rely on data analysis to improve efficiency, understand customer behavior, predict future trends, and solve complex business problems. This subject equips students with essential analytical, logical, and problem-solving skills that are valuable in engineering, management, and research fields. Learning Business Analytics enhances employability opportunities and prepares students for careers in areas such as data analysis, business intelligence, marketing analytics, and financial analysis.							
Prerequisite: 1. Ability to analyze problems and make data-driven decisions. 2. Basic understanding of business processes, decision-making, marketing, finance, and operations.							
Course Objectives: 1. To introduce fundamental concepts of business analytics and its role in decision-making. 2. To understand different types of data and basic data visualization techniques. 3. To develop analytical thinking for solving real-world problems. 4. To explore applications of analytics in business and engineering domains.							
Course Outcomes: After completion of this course, students will be able to:							
(COs)	Course Outcomes (COs):						Blooms Level
CO1	DESCRIBE basic concepts and types of business analytics						2
CO2	INTERPRET and visualize data for decision-making.						3
CO3	APPLY analytical thinking to simple business problems.						3
CO4	INTEGRATE knowledge from marketing, finance, HR, operations, health care, and agri-business analytics						3
Course Contents:							
Unit I	Introduction to Business Analytics				7Hrs.	CO1	
Definition of analytics, Evolution of analytics, The Growing Role of Business Analytics, Business intelligence vs. Data Science, Data Analyst Vs. Business Analyst, Types of Analytics - Descriptive, Diagnostic, Predictive, Prescriptive, Concept of insights. Importance of data in business analytics, Differences between data, information and knowledge, Quality of data, 5Vs of Big Data, Data Sources and collection methods, Data privacy, security, and ethical considerations, Analytical decision-making process, characteristics of the analytical decision-making process.							

Labade

R. Ganigade



Exemplar:-E-commerce (Amazon/Flipkart): Analyzing customer purchase and sales data to improve business decisions.

Unit II	Data Handling and Visualization	8 Hrs.	CO2
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Data Handling Data processing and cleaning, Data cleaning and transformation, Handling missing data, data inspection. Data Mining - Definition, Approaches in Data Mining- Data Exploration & Reduction, Data mining, and business intelligence, Data mining for business, Classification.

Data visualization: Concept of data visualization, Role of data visualization in data analysis and communication, types of data visualizations (for e.g. Charts, graphs, maps), Popular data visualization tools, exploration data analysis (EDA), Data exploration and visualization (using tools like Excel, Tableau, or Power BI).

Exemplar:- Retail Customer Sales Analysis

Unit III	Predictive and Prescriptive Analytics	8 Hrs.	CO3
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Predictive Analytics -Trend Lines and trend analysis, Difference between predictive and prescriptive analytics, Predictive Modeling Techniques- Regression Analysis Linear & Multiple, forecasting Techniques, Cause Effect Modeling, Classification Techniques - Decision Trees.

Prescriptive Analytics -Objectives of prescriptive analytics, Role of prescriptive analytics in decision-making. Prescriptive Analytics Techniques- Linear Optimization, Non-Linear Programming Integer Optimization, Cutting Plane algorithm, Decision Analysis Risk and uncertainty methods - Text analytics Web analytics.

Exemplar:- Sales Demand Forecasting, Analyze a business sales dataset

Unit IV	Business Analytics in Marketing and Finance	7 Hrs.	CO4
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Marketing Analytics, Customer segmentation, targeting, and positioning, Campaign management and ROI measurement, Data-driven marketing strategies. Financial Analytics - Risk management and credit scoring, financial forecasting and planning, Health Care Analytics Predictive analytics for health outcomes, Case studies: Improving health care delivery with analytics. Agri Business Management Analytics - Market analysis and risk management in agriculture, Case studies: Enhancing agricultural productivity with analytics Non-Statistical - Conceptual Treatment only).

Exemplar:- Analyze marketing, financial, healthcare, or agricultural datasets

Textbooks:

1. W. L. Winston, Analytics: Data Analysis and Decision Making, 7th ed. Boston, MA, USA: Cengage Learning, 2020.
2. J. Evans, Business Analytics: Methods, Models, and Decisions, 3rd ed. Boston, MA, USA: Pearson, 2017.
3. D. Vohra, Business Analytics: A Practical Approach, New Delhi, India: McGraw Hill Education, 2017.
4. J. R. Evans and J. W. Dean Jr., Business Analytics: Data Analysis and Decision Making, 2nd ed. Noida, India: Pearson India, 2016.
5. S. Christian Albright and W. L. Winston, Business Analytics: Data Analysis and Decision Making, 6th ed. Boston, MA, USA: Cengage Learning, 2019.
6. F. Provost and T. Fawcett, Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking, 1st ed. Sebastopol, CA, USA: O'Reilly Media, 2013.
7. J. Han, M. Kamber, and J. Pei, Data Mining: Concepts and Techniques, 3rd ed. Burlington, MA, USA: Morgan Kaufmann, 2012.

Reference Books:

1. U. Dinesh Kumar, Business Analytics: The Science of Data-Driven Decision Making, 2nd ed.

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New Delhi, India: Wiley India Pvt. Ltd., 2021

2. R. K. Chitoria, Business Analytics with SAS Studio. New Delhi, India: BPB Publications, 2022.
3. S. Christian Albright and W. L. Winston, Business Analytics: Data Analysis and Decision Making, 7th ed. Boston, MA, USA: Cengage Learning, 2024.
4. J. Leskovec, A. Rajaraman, and J. D. Ullman, Mining of Massive Datasets, 3rd ed. Cambridge, U.K.: Cambridge University Press, 2020.
5. G. Shmueli, P. C. Bruce, N. R. Patel, and P. C. Bruce, Data Mining for Business Analytics: Concepts, Techniques, and Applications in Python, Hoboken, NJ, USA: Wiley, 2020.

MOOCs Links and additional reading material:

1. [Coursera – Business Analytics Specialization \(Wharton School\)](#)
Covers customer analytics, operations analytics, people analytics, and accounting analytics using real business cases. Suitable for beginners and intermediate learners.
2. [Coursera – Data Analysis Course](#)
focuses on statistical analysis, regression, hypothesis testing, and Excel-based analytics tools. Helpful for engineering and management students.
3. [Coursera – Free Business Analytics Courses](#)
Collection of free and beginner-friendly analytics courses including Excel, Power BI, and business intelligence.
4. [NPTEL – Business Analytics & Data Mining Modeling Using R](#)
IIT-based course covering data mining, predictive modeling, and business intelligence using R programming.
5. [NPTEL – Business Intelligence & Analytics](#)
Offered by IIT Madras. Includes regression, clustering, decision trees, ANN, and text mining applications in business analytics.
6. [SWAYAM](#)
Government platform providing free certification courses from IITs, IIMs, and central universities related to Business Analytics, Data Science, and AI.

CO-PO-PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	1	-	-	-	-	-	2
CO2	2	3	1	3	3	-	-	-	2	-	2
CO3	2	3	2	2	2	1	-	1	-	1	2
CO4	2	2	2	2	2	2	1	2	2	3	3
Avg.	2.25	2.5	1.66	2.33	2	1.5	1	1.5	2	2	2.25

Assessment Pattern

BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	√	√	√	–	√	√	√
L4	–	–	–	–	–	–	–	–
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

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This course serves as a prerequisite for / maps with the following future courses:

1. Data Analytics
2. Data Science
3. Predictive Analytics
4. Marketing Analytics
5. Financial Analytics
6. Supply Chain Analytics
7. Business Intelligence
8. Big Data Analytics

Job Mapping:

Job opportunities that one can get after learning this course:

1. **Data Analyst** – collect process, visualize, and interpret data to identify trends and patterns.
2. **Marketing Analyst** – Study customer behavior, campaign performance, and market trends for effective marketing strategies.
3. **Financial Analyst** – Use analytical tools to evaluate financial data, budgeting, forecasting, and investment decisions.



Program:		S. Y. B. Tech.			Semester:		III	
Course:		Principles and Practices of Management			Course Code: R25- ME -OEC- 205			
Teaching Scheme				Examination Scheme				
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR	
02	--	--	02	40	60	--	--	
Course Description: This course introduces students to the fundamental principles and practices of management required for effective functioning in modern organizations and industries. The course covers basic concepts of management, organizational structures, leadership, motivation, communication, planning, and strategic management. Students will gain understanding of managerial roles, decision-making processes, and organizational behaviour through theoretical concepts, case studies, and practical applications related to engineering and industrial environments.								
Course Relevance: Management knowledge is essential for engineering professionals to effectively lead teams, manage projects, make strategic decisions, and solve organizational problems. This course helps Mechanical Engineering students understand the importance of planning, coordination, communication, leadership, and decision-making in industrial and business environments. The subject supports interdisciplinary learning and prepares students for managerial responsibilities in industries, entrepreneurship, project management, manufacturing systems, and organizational development.								
Prerequisite: 1. Basic understanding of organizational and industrial environments. 2. Fundamental communication and interpersonal skills. 3. Interest in management, leadership, and decision-making concepts.								
Bridge Content: 1. Introduction to basic industrial organization structure. 2. Fundamentals of communication and teamwork. 3. Overview of business and management terminology.								
Course Objectives: 1. To present a problem oriented in knowledge of Principle of Management. 2. To provide students with a working knowledge of the skills and functions necessary to be an effective, efficient manager , leader with effective decision making 3. To address the concepts and methods behind motivation and effective communication for solving real problems 4. To examine the management functions (planning, organizing, leading or influencing, and controlling) and the impact of those functions on the business organization.								
Course Outcomes: After learning the course, students will be able to								
CO	Course Outcome						Bloom's Level	
CO1	UNDERSTAND how essential various functions of management are for every business manager.						2	
CO2	EXPLAIN the principles of management to the practical situations concerning the management of people and organizations and decision making in real business life.						2	
CO3	DESCRIBE the role of effective communication and motivation in solving real-life problems.						2	
CO4	EXPLAIN strategies for effective decision making under critical conditions.						2	
Course Content								
Unit 1	Introduction to Management and Organization				7 Hrs.	CO1		
Management: Definition of Management, Nature, Scope, Purpose, Characteristics and Functions of Management. Evolution of Scientific Management, Modern Management, Principles of Management. Organization: Meaning and Concept of Organization, Organizational Structure, Need and Purpose of Organization, Types of Organization.								
Exemplars / Practical Applications and usage: Business management in manufacturing firms, Project management in construction, Organizational design in IT companies, Human resource management in startups, Operations management in service industries								



Unit 2	Manager, Leadership and Decision Making	7 Hrs.	CO2
Manager: Meaning and Role of Manager, Roles of a Manager, Skills of an Effective Manager, Functions of a Manager Leadership: Defining leadership and its role, leadership Style, Leadership Development, Leadership Behavior. Decision Making: Nature and Process of Decision Making, Decision Making under Certainty and Uncertainty, Decision Making Steps & Processes, Brain-Storming			
Exemplars / Practical Applications and usage: Corporate management roles, Team leadership in project management, Executive decision-making in startups, Human resources leadership development, Strategic planning in organizations			
Unit 3	Motivation and Communication	8 Hrs.	CO3
Motivation: Concept, Theories – Classical and Modern, Importance, Financial and Nonfinancial Motivation, Positive and Negative Motivation, Group Motivation. Communication: Definition, Meaning, Nature, Communication Process, Types and Barriers to Communication.			
Exemplars / Practical Applications: Employee motivation programs, Organizational behavior management, Leadership and team motivation, Corporate communication strategies, Change management and internal communication.			
Unit 4	Planning and Strategic Management	8 Hrs.	CO4
Planning: Why Management Process Starts With Planning, Steps in Planning, Planning Premises, Types of Planning, Barriers to Effective Planning, Operational Plan, Strategic Planning, Mckinsey's 7's Approach, SWOT Analysis. Strategic Management: Meaning, Definition, Elements, Scope and Dimensions, Process, Importance, Strategic Decisions			
Exemplars / Practical Applications: Corporate strategic planning, Business operations management, Project planning and execution, SWOT analysis in market research, Strategic decision-making in start-ups.			
Comprehensive Continuous Evaluation (CCE) components for the course:			
1. CCE No. 1 (Unit-I): Group Presentation on Management Gurus (04 Marks) ➤ Activity: Students Group Activity Students shall work in groups and deliver a presentation on management principles proposed by different management gurus using PPTs, charts, videos, or industrial examples. ➤ Expected Work: - Group Presentation - Topic Explanation - Team Participation - Communication and Presentation Skills ➤ Submission: - PPT Softcopy / Brief Summary - Presentation during class			
2. CCE No. 2 (Unit-II): Online Organizational Study Activity (04 Marks) ➤ Activity: Students Group Activity Students shall study any company/startup/industry using online sources such as company websites, YouTube videos, or online reports and understand: - Organizational Structure - Roles and Responsibilities - Departmental Functions - Management Practices ➤ Expected Work: - Observation and Study of Organization - Understanding Hierarchy and Management System ➤ Submission: - Short Report / PPT / Poster Summary			

**3. CCE No. 3 (Unit-III): Group Discussion / Extempore Activity (04 Marks)****➤ Activity: Students Group Activity**

Students shall participate in Group Discussion (GD) or Extempore Activity on management-related topics assigned on the spot.

➤ Expected Work:

- Communication
- Confidence
- Team Interaction
- Leadership and Decision Making Ability

➤ Submission:

- Activity Participation
- Performance during GD / Extempore

4. CCE No. 4 (Unit-IV): Mini / Micro Project on Planning and Management (03 Marks)**➤ Activity: Students Group Activity**

Students shall select a simple product/system/process and study:

- Planning
- Material Requirement
- Production Flow
- Team Coordination
- Quality and Monitoring

➤ Expected Work:

Application-based understanding of management and planning concepts.

➤ Submission:

- Short Report (2–3 Pages)
- PPT / Chart / Model (Optional)

Textbooks:

1. Khanna, O. P., Industrial Engineering and Management, Dhanpat Rai Publications, New Delhi, Latest Edition.
2. Banga, T. R. and Sharma, S. C., Industrial Engineering and Management, Khanna Publications, New Delhi, Latest Edition.
3. He, Jishan, Principles of Engineering Management, Springer Publication, Latest Edition.
4. Bhat, Anil Kumar Arya, Management Principles, Process and Practices, Oxford University Press, Latest Edition.
5. Shejwalkar, P. C. and Ghanekar, A., Principles and Practices of Management, Tata McGraw Hill Publication, Latest Edition.

Reference Books:

1. Prasad, L. M., Principles and Practice of Management, Sultan Chand & Sons, Latest Edition.
2. Gupta, R. N., Principles of Management, Sultan Chand & Co., Latest Edition.
3. Kumar, Vikash, Principles and Practice of Management, Laxmi Publications, Latest Edition.
4. Mitra, J. K., Principles and Practice of Management, Oxford University Press, Latest Edition.
5. Ramasamy, T., Principles of Management, Himalaya Publishing House, Latest Edition.

MOOCs Links and additional reading material:

1. NPTEL – Principles of Management
Available at: https://onlinecourses.nptel.ac.in/noc24_mg47/preview
2. NPTEL – Industrial Management
<https://archive.nptel.ac.in/courses/110/105/110105146/>
3. Principles of Management Lecture
Available at: <https://www.youtube.com/watch?v=d3YgvEqheSc>
4. Principles and Practices of Management
<https://www.youtube.com/playlist?list=PLBtFp6a9Py-f2zTWPQVGwaHX-PQldQUwS>



CO-PO-PSO mapping											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	-	-	-	1	-	-	2	2	2
CO2	2	2	1	1	-	1	-	-	2	2	2
CO3	-	1	-	-	-	1	1	2	3	3	2
CO4	2	2	2	1	-	1	1	1	2	2	3
Avg.	1.25	1.5	1.5	1	-	1	1	1.5	2.25	2.25	2.25

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

Assessment Pattern								
BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	–	–	–	–	–	–	–
L4	–	–	–	–	–	–	–	–
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

This course serves as a prerequisite for / maps with the following future courses:

- Industrial Engineering and Management
- Operations Management
- Project Management
- Entrepreneurship Development
- Production Planning and Control

Job Mapping:

Job opportunities that one can get after learning this course:

- Supervisor
- Project Coordinator
- Entrepreneur
- Human Resource Associate
- Business Development Executive
- Entrepreneur / Startup Founder
- Administrative Officer
- Planning Associate

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Program:		S. Y. B. Tech.		Semester:		III	
Course:		Project Management		Course Code:		R25-EE-OEC-205	
Teaching Scheme				Examination Scheme			
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR
02	-	-	02	40	60	-	-
Course Description: This course introduces foundational and modern project management frameworks adapted for multidisciplinary engineering environments. It covers the Project Life Cycle, PMBOK guidelines, sustainable lifecycle design, and Work Breakdown Structures, transitioning into Agile methodologies, Scrum, and Hybrid Project Management frameworks. Students learn quantitative scheduling (CPM/PERT), cross-functional resource levelling, industry tools (Jira/Microsoft Project), Earned Value Management, and systematic engineering risk control including safety and environmental.							
Course Relevance: This course aligns with engineering excellence which requires balancing technical design with budget, time, and risk constraints. This course equips students with Agile team competencies, hands-on exposure to industry-standard project tracking software, and quantitative risk-management skills essential assets for transitioning seamlessly into tech-lead, product, or engineering management roles across diverse industrial sectors.							
Prerequisite: Programming & Problem Solving							
Bridge Content: Basic coding logic with structured, collaborative software delivery							
Course Objectives: This course aims to:							
1. Understand and explain the fundamental principles of project management 2. Execute and demonstrate systematic processes for project planning, organizing, and controlling projects. 3. Apply practical skills to develop project scheduling, budgeting models, and resource allocation matrices. 4. Identify and comprehend risk management principles, quality control mechanisms, and stakeholder management frameworks in projects. 5. Implement and adapt theoretical project management concepts to real-world scenarios and case studies.							
Course Outcomes: After learning the course, students will be able to							
CO	Course Outcome						Bloom's Level
CO1	EXPLAIN the principles of project management, project planning and execution.						2
CO2	APPLY project management concepts to real-world scenarios.						3
CO3	APPLY Agile Project Management.						3
CO4	DISCUSS the importance of risk management, quality control, and stakeholder management in projects.						2



Course Content			
Unit 1	Introduction to Project Management	7 Hrs.	CO1
Project Definition, Project Life Cycle, processes and Knowledge areas in Project management, WBS and its types, introduction to PMBOK, portfolio Management, Traditional Vs Modern Project using PMBOK Concept. Sustainable project lifecycle principles, socio-environmental impact frameworks, and multi-disciplinary project constraints.			
Case Study: Online Shopping			
Unit 2	Agile & Hybrid Project Frameworks	7 Hrs.	CO2
Introduction, Agile methods, Scrum, Comparison between Non-Agile and Agile Project, three stages of Agile Project, Plan driven and Agile development. Roles and responsibilities, Scheduling and tracking. Hybrid Project Management frameworks combining plan-driven Waterfall for hardware/infrastructure with Agile for iterative subsystem design and delivery.			
Case Study: Analyse the same project using Agile. Create the three stages of the project			
Unit 3	Project Planning, Scheduling & Tooling	8 Hrs.	CO3
Introduction to project planning, Project planning process, Gantt Chart, PERT chart, CPM, Microsoft Projects, and Primavera Project Management Software, Role of Project Manager, Objectives of Activity planning, Project Schedules, Activities, Sequencing and Scheduling. Cross-functional resource levelling, material procurement lead-time constraints, and equipment dependency mapping.			
Case study: Develop the Software project plan using Microsoft Projects or any open-source tool like Jira, Kanban, extreme programming			
Unit 4	Project Execution, Control & Risk Management	8 Hrs.	CO4
Project execution: task assignment, tracking, and monitoring - Project control: schedule control, budget control, and quality control - Earned value management (EVM) and project performance measurement - Project reporting and communication. Risk management principles and concepts - Risk identification, analysis, and prioritization - Risk response planning and implementation - Risk monitoring and review. Health, Safety, and Environment (HSE) risk tracking, regulatory compliance milestones, and environmental clearance frameworks.			
Case study: Bharat Bazaar-ONDC Integration & Digital Payment Rollout			
Course Projects:			
1. "Kirana-Cart" Local E-Commerce Feature Rollout 2. "Tech-Fest Ticket Gateway" Project Plan 3. "Smart Campus EV Charging" Activity Tracker 4. "BharatPay Integration" Health Dashboard 5. "Smart-Campus Attendance System" Risk Ledger			

**Textbooks:**

1. Erik W. Larson and Clifford F. Gray "Project management: The managerial process.", McGraw-Hill Education, (2018), ISBN 9781259666094 | ISBN 1259666093
2. Harold Kerzner. "Project management: A Systems Approach to Planning, Scheduling, and Controlling.", Wiley, (2005), ISBN: 9781119805380
3. John M. Nicholas & Herman Steyn. "Project management for engineering, business and technology", Routledge, (2020). ISBN 9781032665887
4. Roger S. Pressman, "Software Engineering: A Practitioner 's Approach", McGraw Hill, ISBN 978-0-07-337597-7 — ISBN 0-07-337597-7

Reference Books:

1. Project Management Institute (PMI), "A Guide to the Project Management Body of Knowledge (PMBOK Guide)", (2021), ISBN 9781628256642
2. Eric Verzuh, "The Fast Forward MBA in Project Management", Wiley, (2015), Print ISBN: 9781119148227, Online ISBN:9781119176350
3. Pankaj Jalote, "An Integrated Approach to Software Engineering", Springer, ISBN 13:9788173192715
4. S K Chang, "Handbook of Software Engineering and Knowledge Engineering", World Scientific, Vol I, II, ISBN: 978-981-02-4973-1

MOOCs Links and additional reading material:

1. Project Management: https://onlinecourses.nptel.ac.in/noc24_mg01/preview
2. Software Engineering: https://onlinecourses.swayam2.ac.in/cec20_cs07/preview
3. Project Management: <https://www.atlassian.com/work-management/project-management>
4. Project Management: <https://nptel.ac.in/courses/110107430>

CO-PO-PSO mapping											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	-	-	2
CO2	-	-	-	-	3	-	-	-	-	-	3
CO3	-	-	-	-	3	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	-	3	3
Avg.	-	-	-	-	3	-	-	2	3	3	2.67

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

**Assessment Pattern**

BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	√	√	–	–	√	√	–
L4	–	–	–	–	–	–	–	–
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

This course serves as a prerequisite for / maps with the following future courses:

1. Major Project (Phase I & Phase II)
2. Industrial Training / Internship
3. Power System Design, Practice and High Voltage Engineering
4. Industrial Automation and Control

Job Mapping:

Job opportunities that one can get after learning this course: Project Engineer / Site Engineer (Power Distribution & Transmission), Electrical Design & Prototype Engineer (Drives & EV Networks), Quality Assurance (QA) & Commissioning Engineer



Program:		S. Y. B. Tech.			Semester:		III	
Course:		Leadership and Organizational Behavior			Course Code:		R25-EC-OEC-205	
Teaching Scheme (Hrs. / Wk.)				Examination Scheme				
Lecture	Practical	Tutorial	Credit	CCE	ESE	TW	PR	
02	-	-	02	40	60	-	-	
Course Description: This course focuses on the fundamental concepts of Organizational Behavior and Leadership Development. It aims to develop students’ understanding of individual and group Behavior within organizations while enhancing leadership competencies required for effective managerial and professional performance. The course emphasizes motivation, team dynamics, communication, organizational culture, conflict management, emotional intelligence, and leadership practices.								
Course Relevance: The course Leadership and Organizational Behavior is highly relevant in today’s professional environment as it develops communication, teamwork, leadership, and interpersonal skills essential for organizational success. The course prepares students to handle real-world organizational challenges, improve decision-making abilities, and become effective future leaders.								
Prerequisite: Basic understanding of communication skills, human Behavior, and teamwork is desirable for this course.								
Bridge Content: -								
Course Objectives: 1. To understand the basic concepts and significance of Organizational Behavior. 2. To develop knowledge of leadership theories and leadership effectiveness. 3. To enhance interpersonal, communication, and team management skills. 4. To analyze individual and group Behavior in organizational settings. 5. To apply Behavioral and leadership concepts for organizational effectiveness.								
Course Outcomes: After learning the course, students will be able to								
CO	Course Outcome						Bloom’s Level	
CO1	EXPLAIN the fundamental concepts of Organizational Behavior and Leadership Development.						2	
CO2	ANALYZE individual and group Behavior in organizational settings.						4	
CO3	APPLY motivation and leadership theories to workplace situations.						3	
CO4	DEVELOP leadership competencies for organizational effectiveness and professional growth.						2	
Course Content								
Unit 1	Introduction to Organizational Behavior					8 Hrs.	CO1	
Meaning, nature, scope and importance of Organizational Behavior; Challenges and opportunities in OB; Individual Behavior in organizations Practical / Activity Component: SWOT Analysis of Organizational Behavior Problems. Foundations of Individual Behavior: Personality, Attitudes, Values, Perception, Emotional Intelligence Motivation and Employee Engagement: Maslow’s Need Hierarchy Theory, Herzberg’s Two Factor Theory, McGregor Theory X & Y, Vroom Expectancy Theory, Employee engagement practices.								
Exemplars / Practical Applications and usage: Human Resource departments use Organizational Behavior principles to improve employee motivation, engagement, teamwork, leadership effectiveness, and workplace productivity.								

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Unit 2	Group Behavior and Team Dynamics	7 Hrs.	CO2
Group formation, Group Behavior; Team building, Team effectiveness, Interpersonal relationships. Practical / Activity Component: Tower Building Exercise Organizational Culture and Change Management: Organizational culture, Types of culture, Managing organizational change, Resistance to change, Change leadership			
Exemplars / Practical Applications and usage: Organizations use team-building and organizational change management practices to improve collaboration among employees, enhance team performance, and successfully implement strategic changes.			
Unit 3	Leadership Fundamentals	8 Hrs.	CO3
Meaning and importance of leadership, Leadership traits and skills, Leadership styles, Leadership versus management Practical / Activity Components: Johari Window Exercise Leadership Theories and Models : Trait Theory, Behavioral Theory, Contingency Theory, Situational Leadership, Transformational and Transactional Leadership Practical / Activity Components: TED-style Leadership Talk			
Exemplars / Practical Applications and usage: Organizations apply leadership principles and leadership models to develop effective managers and team leaders.			
Unit 4	Leadership Development and Contemporary Issues	7 Hrs.	CO4
Leadership development practices, Coaching and mentoring, Diversity and inclusion, Future leadership challenges Practical / Activity Components: Leaderless Group Discussion Power, Politics and Conflict Management: Sources of power, Organizational politics, Conflict process, Conflict resolution and negotiation techniques			
Exemplars / Practical Applications and usage: Organizations use leadership development, conflict management, and negotiation techniques to build future leaders, promote diversity and inclusion, manage workplace conflicts, facilitate effective decision-making, and maintain productive relationships among employees, teams, and stakeholders.			
Textbooks:			
1. Stephen P. Robbins, Tim Judge. Organizational Behavior. Prentice Hall, 2009. 2. Fred Luthans, Organizational Behavior: An Evidence-based Approach. McGraw-Hill, 2011. 3. Peter G. Northouse, Leadership: Theory and Practice. SAGE Publications, 2010. 4. John W. Newstrom, Organizational Behavior: Human Behavior at Work. McGraw-Hill, 2014.			
Reference Books:			
1. Daniel Goleman, Emotional Intelligence. Bantam Books, 1995. 2. Harold Koontz & Heinz Weihrich – Essentials of Management, McGraw-Hill, 1986 3. Peter G. Northouse, Leadership: Theory and Practice, SAGE Publications, 2010. 4. Stephen R. Covey, The 7 Habits of Highly Effective People, Free Press, 2004.			
MOOCs Links and additional reading material:			
1. NOC: Management Information System, IIT Kharagpur https://nptel.ac.in/courses/110105148?utm_source 2. NOC: Leadership, IIT Kharagpur https://nptel.ac.in/courses/122105021?utm_source 3. International Leadership and Organizational Behavior https://www.coursera.org/learn/organizational-behavior?utm_source			



CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	2	2	3	2	2
CO2	-	-	-	-	-	-	2	2	3	2	2
CO3	-	-	-	-	-	-	2	2	3	2	2
CO4	-	-	-	-	-	-	2	2	3	2	2
Avg.	-	-	-	-	-	-	2	2	3	2	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Assessment Pattern								
BT Level	CCE				ESE			
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4
	10	10	10	10	15	15	15	15
L1	√	√	√	√	√	√	√	√
L2	√	√	√	√	√	√	√	√
L3	–	√	√	–	–	√	√	–
L4	–	√	–	–	–	√	–	–
L5	–	–	–	–	–	–	–	–
L6	–	–	–	–	–	–	–	–

This course serves as a prerequisite for / maps with the following future courses:

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Job Mapping: Job opportunities that one can get after learning this course:

1. Human Resource Executive / HR Manager
2. Talent Acquisition Specialist
3. Team Leader / Project Leader
4. Corporate Trainer
5. Entrepreneur / Startup Founder

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