



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Logistics and Freight Management	Course Code: CEPL311	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Logistics and Freight Management: Introduction to Logistics and Supply Chain Management, Evolution and Importance of Freight Management, Key Components of Logistics, Types of Freight Transport (Road, Rail, Air, Sea), Freight Transport Infrastructure and Operations.	8
3	Freight Transport Planning and Operations: Freight Transport Demand Analysis, Freight Route Selection and Network Planning, Scheduling and Routing of Freight, Capacity Planning in Freight Transport, Multi-modal Transport and Intermodal Connections.	9
4	Logistics Strategies and Optimization: Inventory Management and Warehousing, Freight Consolidation and Distribution, Just-In-Time (JIT) Logistics, Freight Cost Optimization Techniques, Risk Management in Freight Operations.	9
5	Freight Transport Economics and Policy: Freight Transport Economics: Cost Structures, Pricing, and Market Structure, Environmental Impact of Freight Transport, Government Policies in Freight Transport, Freight Regulations and Standards, Green logistics and Environmental Sustainability.	9
6	Technology in Freight and Logistics Management: Role of Information Technology (IT) in Freight Management, Advanced Technologies: RFID, GPS, EDI, Freight Management Systems (FMS) and Transportation Management Systems (TMS), Automation in Freight Operations, Big Data, AI, and Blockchain in Freight and Logistics.	9
Total		45

Text Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Fundamentals of Logistics	Douglas Lambert, James Stock, Lisa Ellram	McGraw-Hill	1998
2.	Transportation Planning: Principles, Practices and Policies	Pradip Kumar Sarkar, Vinay Maitri and G. J. Joshi	Prentice Hall India Learning Private Limited	3 rd (2022)



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Reference Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Transport Logistics (Classics in Transport Analysis series)	Alan McKinnon, Kenneth Button, Peter Nijkamp	Edward Elgar Publishing	2002
2.	Freight Transport Management	Bhavya Bhanu, Dr. Priya Srinivasa, K. Rajeswari	Vision Book House	

Prerequisite:

1. Basic Knowledge of Transportation Systems – Understanding transportation modes (road, rail, air, sea) and infrastructure.
2. Principles of Logistics and Supply Chain Management – Familiarity with logistics concepts, inventory, and distribution systems.
3. Introduction to Transportation Economics – Basic understanding of cost analysis, pricing strategies, and economic evaluation in transport.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Sustainable Construction Engineering	Course Code: CEPL312	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Sustainability- Introduction, Need and concept of sustainability, Social environmental and economic sustainability concepts. Sustainable development, Nexus between Technology and Sustainable development, Challenges for Sustainable Development. Multilateral environmental agreements and Protocols-Clean Development Mechanism (CDM), Environmental legislations in India-Water Act, Air Act.	12
3	Air Pollution- Effects of Air Pollution; Water pollution-sources, Sustainable wastewater treatment, Solid waste-sources, impacts of solid waste, Zero waste concept, 3 R concept. Global environmental issues-Resource degradation, Climate change, Global warming, Ozone layer depletion, and Regional and Local Environmental Issues. Carbon credits and carbon trading, carbon footprint. Environmental management standards, ISO 14000 series, Life Cycle Analysis (LCA)-Scope and Goal, Bio-mimicking, Environment Impact Assessment (EIA)-Procedures of EIA in India.	14
4	Basic concepts of sustainable habitat, green materials for highway construction, material selection for sustainable design. Sustainable cities, Sustainable transport. Energy sources: Basic concepts- Conventional and nonconventional, solar energy, Fuel cells, Wind energy, Small hydro plants, bio-fuels, Energy derived from oceans, Geothermal energy, Prefabricated materials in highway construction.	11
5	Green Engineering, Sustainable Urbanization, industrialization and poverty reduction; Social and technological change, Industrial Processes: Material selection, Pollution Prevention, Industrial Ecology, Industrial symbiosis, Sustainable waste management practices specific to construction sites, Government initiatives for sustainable development.	7
Total		45



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Text Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Sustainability Engineering: Concepts, Design and Case Studies	Allen, D. T. and Shonnard, D. R.	Prentice Hall	2011
2.	Engineering applications in sustainable design and development	Bradley. A.S; Adebayo, A.O., Maria, P.	Cengage learning	2015
3.	Systems Analysis for Sustainable Engineering: Theory and Applications	Ni bin Chang	McGraw-Hill Professional	2010
4.	Renewable Energy Resources	Twidell, J. W. and Weir, A. D.	English Language Book Society (ELBS)	3 rd , 2015
5.	Green Technology - An approach for sustainable environment	Purohit, S. S.	Agrobios Publication	2008

Reference Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Environment Impact Assessment Guidelines		Government of India	2006
2.	Basic Concepts in Environmental Management	Mackenthun, K.M.	Lewis Publication	1999
3.	ECBC Code 2007	Bureau of Energy Efficiency, New Delhi Bureau of Energy Efficiency Publications-Rating System	TERI Publications	2007

Prerequisite:

Basics of Transportation Engineering studied at the B.Tech. level.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Road Asset Management System	Course Code: CEPL313	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course, and Prerequisite. Definition and importance of Road Asset Management Systems (RAMS). Evolution and need for RAM in modern transportation systems, challenges in implementing RAM systems in developing nations.	2
2	Road Asset Inventory and Data Management: Inventory collection methods: Manual, Automated, and Remote Sensing. Components of road assets: pavements, bridges, drainage systems, signage, and road furniture. Data integration using GIS and GPS technologies.	7
3	Performance Evaluation of Road Assets: Key performance indicators: Roughness, Rutting, Cracking, Structural Integrity. Non-destructive testing methods: Benkelman Beam, Falling Weight Deflectometer (FWD), Ultrasonic testing. Pavement condition index (PCI) and Bridge condition index (BCI). Life-cycle cost analysis (LCCA) for performance-based maintenance.	10
4	Decision-Making and Prioritization: Multi-criteria decision analysis (MCDA) for resource allocation, Budgeting and Prioritization techniques for maintenance and rehabilitation planning.	8
5	Maintenance and Rehabilitation Strategies: Maintenance types: Preventive, Corrective, and Emergency. Overlay design: Flexible and Rigid overlays. Strategies for sustainable maintenance of road assets.	10
6	Advanced Technologies in Road Asset Management: Applications of IoT, Artificial Intelligence (AI), and Big Data analytics in real-time monitoring. Smart city initiatives and integration with RAM systems. Case studies of global best practices in road asset management.	8
Total		45

Textbooks

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Modern Pavement Management	Hass, R., Hudson, W.R., and Zaniewski, J.	Krieger Publishing Company	1994
2.	The Handbook of Highway Engineering	Fwa, T.F.	CRC Press	2005
3.	Pavement Management for Airports, Roads, and Parking Lots	Shain, M.Y.	Kluwer Academic Publishers Group	2006



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Reference Books

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Infrastructure Management	Hudson, W.R., Haas, R., and Uddin, W.	McGraw Hill	1994
2.	Guidelines for Road Maintenance		Ministry of Road Transport and Highways (MoRTH)	
3.	Pavement Management for Airports, Roads, and Parking Lots	Shain, M.Y.	Kluwer Academic Publishers Group	2006

Prerequisite:

The students should have basic knowledge of mass transport facilities.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Research Methodology and IPR	Course Code: NP40.02	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Research Methodology: Basic Statistics, Inferential statistics, Central tendency of data, Standard deviation, frequency distribution, level of measurement, Probability distribution, Normal distribution, Correlation, Numerical problems, Introduction to research, Need of research, Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem	8
3	Research Approaches: Approaches of investigation of solutions for research problems, Sample design, data collection, Regression and Z-test, t-test, ANOVA, analysis, interpretation, Necessary instrumentations, Effective literature studies approaches, analysis. Plagiarism, Research ethics, examples	7
4	Effective Technical Writing: Development of Research Proposal, citation of references, Report writing, Precautions for writing research reports	8
5	Nature of Intellectual Property: Patents, Designs, Trademarks, and Copyright, Geographical Indications. Process of Patenting and Development, International Scenario, International Cooperation on Intellectual Property	8
6	Patent Rights: Scope of Patent Rights, Licensing and transfer of technology, patent Infringement and Enforcement. New developments in IPR: IPR of Biological Systems, Computer Software, etc. Case Studies on Intellectual Properties	8
Total		40

Textbooks

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Research Methodology	C. R. Kothari	New Age Publication	2 nd 2014
2.	Research Methodology-Concept and Cases	Deepak Chawla	Vikas Publications	2 nd 2018
3.	Intellectual Property A Primer for Academia	Dr. Rupinder Tewari and Ms. Mamta Bhardwaj	Honorary Director Publication Bureau, Panjab University Chandigarh	2021



Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur

(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Reference Books

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Research Methodology and Quantitative Methods	Rao G Nageswara	B S Publications	2019
2.	Intellectual Property rights	Ganguli Prabuddha	McGraw Hill Education	2020

Prerequisite:

A basic understanding of research methods including data collection, analysis, and writing research reports, along with foundation knowledge of intellectual property concepts like patents, trademarks, copyrights, and trade secrets.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: I	Semester: I
Course Name: Sustainable Transportation	Course Code: CEPL340.01	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Introduction to Sustainable Transportation: Overview of Transportation Systems and Sustainability, The Triple Bottom Line: Environmental, Economic, and Social Dimensions, Key Challenge in Sustainable Transportation	10
3	Environmental Impacts of Transportation: Greenhouse Gas Emissions and Climate Change, Air and Noise Pollution from Transportation, Land Use, Biodiversity, and Habitat Fragmentation	8
4	Public Transit Systems: Role of Public Transit in Sustainability, Innovations in Bus Rapid Transit (BRT), Case Studies: Electric buses, metro systems, and shared mobility solutions.	8
5	Active Transportation and Emerging Technologies in Transportation: Promoting Walking and Cycling, Infrastructure Design for pedestrian facilities and cycling lanes, Case Studies: Bicycle-Friendly Cities, Electric and Hybrid Vehicles, Autonomous and Connected Vehicles, Smart Transportation Systems and IoT.	8
6	Future of Sustainable Transportation: Decarbonizing Transportation, Circular Economy in Transportation, Climate Resilient Transportation Infrastructure	6
7	Global Perspectives: National Urban Transport Policy (NUTP) in India and UN Sustainable Development Goals (SDGs)	4
Total		45

Text Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Traffic Engineering & Transport Planning	Kadiyali, L.R.	Khanna Publishers, New Delhi	2024
2.	Transportation Engineering – An Introduction	C. Jotin Khisty, B. Kent Lall	Pearson	3 rd , 2017



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Reference Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Introduction to Transportation Engineering & Planning	Hutchison, B.G.	Tata McGraw Hill	
2.	Fundamentals of Transportation System Analysis	Papacostas, C.S.	PHI	3 rd

Prerequisite:

1. The students should have basic knowledge of mass transport facilities.
2. Knowledge of surveys conducted for operations of mass transit facilities.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Occupational Health & Safety	Course Code: CEPL340.02	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Introduction to the course: Relevance of OHS in Global Industrial Scenario and impacts on Economy. Job opportunities as Safety Engineers. OSHA Limitations and the Need for Change. Occupational Hazard and Control Principles: Safety, History and development, National Safety Policy. Occupational safety and Health Act (OSHA), Occupational Health and Safety administration - Laws governing OSHA and right to know. Accident – causation, investigation, investigation plan, Methods of acquiring accident facts, Supervisory role in accident investigation. Program Workers' Compensation - Unsafe Acts vs. Unsafe Conditions.	6
3	Ergonomics at Work Place: Ergonomics Task analysis, Preventing Ergonomic Hazards, Work space. Envelops, Visual Ergonomics, Ergonomic Standards, Ergonomic Programs. Hazard cognition and Analysis, Human Error Analysis – Fault Tree Analysis – Emergency Response - Decision for action – purpose and considerations. Indoor Air Quality: Asbestos Awareness - Blood-borne Pathogen	10
4	Fire Prevention and Protection: Fire Triangle, Fire Development and its severity, Effect of Enclosures, early detection of Fire, Classification of fire and Fire Extinguishers. Electrical Safety: Standard and Lockout/Tagout - Product Safety: Technical Requirements of Product safety - Process Safety Management. Exit Routes, Emergency Action Plans and Confined Spaces & Entry	10
5	Health Considerations at Work Place: Types of diseases and their spread, Health Emergency. Principles of Personal Protective Equipment/Clothing, types and advantages, effects of exposure and treatment for engineering industries, municipal solid waste. Environment management plans (EMP) for safety and sustainability. Forklift Safety/Heat Stress/Ladder Safety /Scaffold Safety.	10
6	Principles of Industrial Hygiene - Occupational Health and Safety Considerations: Water and wastewater treatment plants, Handling of chemical and safety measures in water and wastewater treatment plants and labs, Construction material manufacturing industries like cement plants, RMC Plants, precast plants, and construction sites. Policies, roles and responsibilities of workers, managers, and supervisors. OSHA Record Keeping, Safety training and awareness program	8
Total		45



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Text Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Occupational Safety and Health for Technologists	David L Geotsch	Pearson	8 th , 2014
2.	Industrial Safety, Health and Environment Management Systems	R.K. Jain, Sunil S. Rao	Khanna Publishers	2000
3.	Occupational Safety, Health and Working Conditions Code, 2020		EBC	2025

Reference Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Industrial Safety Management and Technology	Colling D.A.	Prentice Hall	1990
2.	Safety and Environmental Management	Della D.E. and Giustina Van	Government Institutes Inc., U.S.	2 nd , 2007
3.	Safety and Health for Engineers	Roger L. Brauer	Wiley	3 rd , 2016

Standards and Guidelines:

1. ISO 45001 Occupational Health and Safety Management Systems
2. National and regional OHS regulations

Prerequisite:

1. Students should have basic knowledge of civil engineering fundamentals.
2. Students should have basic knowledge of basic principle of safety & Hygiene.



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Syllabus

Name of the Programme: M.Tech. in Transportation Engineering	Year: II	Semester: III
Course Name: Project Management	Course Code: CEPL340.03	Credit: 3
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 hrs	Teaching Scheme: 3L+0T+0P	

Module No.	Contents	Hours
1	Introduction: Objective, Scope, Outcome of the Course and Prerequisite	1
2	Project Initiation: Concepts of projects, characteristics and functions of Project Management, Phases of project life cycle, Tools and techniques for project management, Project in the organization structure, Human factors and the project team, Work break down structure.	9
3	Project Planning: Project feasibility analysis, Estimating project budgets, Project risk management, Quantitative risk assessment methodologies, Critical path method (CPM), Programme evaluation and review technique (PERT), Risk analysis with simulation for scheduling, Gantt Chart, Scheduling with scrum, Crashing a project, Resource levelling.	10
4	Project Execution: Planning-monitoring-controlling cycle, Earned value analysis, Agile tools for tracking project, - Project audit, Essentials of an audit/evaluation, When to close a project Benefits realization, Case study on the success of Chandrayan-3	10
5	Project Time Cost Analysis: Cost time analysis in network planning, updating, Contracts: Introduction, types of contracts and their advantages and disadvantages, Introduction to Indian contract act. Tender: Tender form, Tender Documents, Tender Notice.	10
6	Technological Advancements in Project Management: Advanced Resource and Introduction of Project Management Software, Hybrid Project Management.	5
Total		45

Text Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Project Planning And Control With PERT And CPM	Dr. B. C. Punmia, K. K. Khandelwal	Laxmi Publications	4 th , 2002
2.	Construction Project Management	Kumar Neeraj Jha	Pearson Education	2 nd , 2015
3.	Construction and Project Management	KG Krishnamurthy & SV Ravindra	CBS Publishers	2 nd



**Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur**
(An Autonomous Institute Affiliated to Rajasthan Technical University, Kota)

Reference Books:

Sr.No.	Title	Author (s)	Publisher	Edition
1.	Construction Project Management Planning (Planning, Scheduling and Controlling)	K. K. Chitkara	Tata McGraw-Hill Education	2 nd , 2010
2.	Construction Planning, Equipment and Methods	R. L. Peurifoy, Clifford J. Schexnayder & Aviad Shapira	Tata McGraw-Hill Education	2 nd , 2005
3.	Project management a system approach to planning scheduling and controlling	Harold Kerzner	Wiley	13 th , 2022

Prerequisite:

1. The students should have basic knowledge of mass transport facilities.
2. Knowledge of surveys conducted for operations of mass transit facilities.