

Applications”, CRC Press, 1998

<p align="center"><b>Course Title: Traffic Engineering</b>  <b>Open Elective-1</b>  [As per Choice Based Credit System (CBCS) scheme]  SEMESTER:V</p>			
Subject Code	15CV561	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 03</b>		<b>Total Marks-100</b>	
<p><b>Course Objectives:</b> This course will enable students to</p> <ol style="list-style-type: none"> <li>1. Understand fundamental knowledge of traffic engineering, scope and its importance.</li> <li>2. describe basic techniques for collecting and analysing traffic data, diagnosing problems, designing appropriate remedial treatment, and assessing its effectiveness.</li> <li>3. Apply probabilistic and queuing theory techniques for the analysis of traffic flow situations and emphasis the interaction of flow efficiency and traffic safety.</li> <li>4. understand and analyse traffic issues including safety, planning, design, operation and control.</li> <li>5. Apply intelligent transport system and its applications in the present traffic scenario.</li> </ol>			
<b>Modules</b>		<b>Teaching Hours</b>	<b>Revised Bloom's Taxonomy (RBT) Level</b>
<b>Module -1</b>			
<p><b>Traffic Planning and Characteristics:</b> Road Characteristics-Road user characteristics, PIEV theory, Vehicle Performance characteristics, Fundamentals of Traffic Flow, Urban Traffic problems in India, Integrated planning of town, country, regional and all urban infrastructures, Sustainable approach- land use &amp; transport and modal integration.</p>		8 hours	L1,L2,L3
<b>Module -2</b>			
<p><b>Traffic Surveys:</b> Traffic Surveys- Speed, journey time and delay surveys, Vehicles Volume Survey including non-motorized transports, Methods and interpretation, Origin Destination Survey, Methods and presentation, Parking Survey, Accident analyses-Methods, interpretation and presentation, Statistical applications in traffic studies and traffic forecasting, Level of service- Concept,</p>		8 Hours	L1,L2,L3,L4,L5

applications and significance.		
<b>Module -3</b>		
<b>Traffic Design and Visual Aids:</b> Intersection Design- channelization, Rotary intersection design, Signal design, Coordination of signals, Grade separation, Traffic signs including VMS and road markings, Significant roles of traffic control personnel, Networking pedestrian facilities & cycle tracks.	8 Hours	L1,L2,L3,L4
<b>Module -4</b>		
<b>Traffic Safety and Environment:</b> Road accidents, Causes, effect, prevention, and cost, Street lighting, Traffic and environment hazards, Air and Noise Pollution, causes, abatement measures, Promotion and integration of public transportation, Promotion of non-motorized transport.	8 Hours	L1,L2,L3
<b>Module -5</b>		
<b>Traffic Management:</b> Area Traffic Management System, Traffic System Management (TSM) with IRC standards, Traffic Regulatory Measures, Travel Demand Management (TDM), Direct and indirect methods, Congestion and parking pricing, All segregation methods- Coordination among different agencies, Intelligent Transport System for traffic management, enforcement and education.	8 Hours	L1,L2,L3,L4
<p><b>Course outcomes:</b> After studying this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the human factors and vehicular factors in traffic engineering design.</li> <li>2. Conduct different types of traffic surveys and analysis of collected data using statistical concepts.</li> <li>3. Use an appropriate traffic flow theory and to comprehend the capacity &amp; signalized intersection analysis.</li> <li>4. Understand the basic knowledge of Intelligent Transportation System.</li> </ol>		
<p><b>Program Objectives:</b></p> <ul style="list-style-type: none"> <li>• Engineering knowledge</li> <li>• Problem analysis</li> <li>• Interpretation of data</li> </ul>		
<p><b>Question Paper Pattern:</b></p> <ul style="list-style-type: none"> <li>• The question paper will have 5 modules comprising of ten questions. Each full question carrying 16 marks</li> <li>• There will be two full questions (with a maximum of three subdivisions, if necessary) from each module.</li> <li>• Each full question shall cover the topics as a module</li> <li>• The students shall answer five full questions, selecting one full question from each module. If more than one question is answered in modules, best answer will be considered for the award of marks limiting one full question answer in each module.</li> </ul>		
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Kadiyali.L.R. “<b>Traffic Engineering and Transport Planning</b>”, Khanna Publishers, Delhi, 2013</li> <li>2. S K Khanna and CEG Justo and A Veeraragavan, “<b>Highway Engineering</b>”, Nem Chand and Bros.</li> <li>3. Indian Roads Congress (IRC) Specifications: Guidelines and Special Publications on Traffic Planning and</li> </ol>		

Management.

4. Salter. R.I and Hounsell N.B, “**Highway Traffic Analysis and design**”, Macmillan Press Ltd.1996.

**Reference Books:**

1. Fred L. Mannering, Scott S. Washburn and Walter P.Kilareski, Principles of Highway Engineering and Traffic Analysis, Wiley India Pvt. Ltd., New Delhi, 2011
2. Garber and Hoel, “Principles of Traffic and Highway Engineering”, CENGAGE Learning, New Delhi, 2010
3. SP:43-1994, IRC Specification, “Guidelines on Low-cost Traffic Management Techniques” for Urban Areas, 1994
4. John E Tyworth, “Traffic Management Planning, Operations and control”, Addison Wesley Publishing Company, 1996
5. Hobbs.F.D. “Traffic Planning and Engineering”, University of Brimingham, Peragamon Press Ltd, 2005

**Course Title: Sustainability Concepts in Engineering**

**Open Elective 1**

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER:V

Subject Code	15CV562	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	40	Exam Hours	03
<b>CREDITS – 03</b>		<b>Total Marks-100</b>	

**Course Objectives:** This course will enable students to

1. Learn about the principles, indicators and general concept of sustainability.
2. Apprehend the local, regional and global impacts of unsustainable designs, products and processes.
3. Student shall be able to apply the sustainability concepts in engineering
4. Know built environment frameworks and their use
5. Understand how building and design is judged and valued by clients and stakeholders and how to implement sustainability.

Modules	Teaching Hours	Revised Bloom’s Taxonomy (RBT) Level
<b>Module -1</b>		
<b>Introduction:</b> 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.	8 hours	L1,L2,L3
<b>Module -2</b>		
<b>Global Environmental Issue:</b> Resource degradation, Climate change, Regional and Local Environmental Issues. Carbon credits and carbon trading, carbon foot print Carbon sequestration – Carbon capture and storage (CCS). Environmental management standards, ISO 14000 series, Life Cycle Analysis (LCA) - Scope and	8 Hours	L1,L2,L3