GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. SEMESTER: III

CIVIL (TRANSPORTATION ENGINEERING)

Subject Name: **Transportation Design Project**

Course Objectives:

1. To make the students conversant with practical design application of core Transportation subjects of Pavement Design and Traffic Infrastructure Design.
2. To make the students confident about field applications of Highway project by carrying out all laboratory testing procedure themselves.
3. To make the student confident about the design of elements of traffic infrastructure by carrying out all procedure of field data collection to laboratory computation work themselves.

Sr. No	Course content
1.	a. **Highway Material Testing and Pavement Design:** The group of students (not more than 5 students) should collect the samples of highway construction materials and traffic data from the field. They should test the samples in laboratory as per standard procedure, prepare mix design and also design the different layers of pavement as per the current IRC code practice. b. **The List of Tests:** Tests on soils, CBR/Plate load test, Aggregate tests, Bituminous material test, Marshall Stability test, Tests on concrete. Tests shall be carried out as per the selected type of pavement (Flexible/Rigid) and as per requirements.
2.	a. **Traffic Infrastructure Design:** The same group of students should also collect the traffic and geometric data from the field for particular traffic problem solution. They should analyze the data, use the standard practice and apply computation technique for giving detailed design solution of the traffic infrastructure problem. b. **The list of Traffic Infrastructure Elements:** Rotary/Round about, T or Y junction, Signal design for isolated intersection, Co-ordinated signal system, Flyovers, Interchanges, Parking plaza etc. Any one element shall be selected by a group. c. **Different Problems Shall be Given to Each Group:** A project report inclusive of above both designs by a group of students shall be prepared and submitted with presentation to the examiners on scheduled date. The presentation should include the evidences (in the form of photographs and/or video) of data collection on field and testing procedure in the laboratory by involvement of each student of the group.

Field Work:

Collection of highway construction material samples, traffic data, geometric data.

Field Visit:

Visit to ongoing Highway Construction Project and a visit to the ongoing Traffic Infrastructure Construction Project.

Reference Books:

1. Walker and Martin. Asphalt Pavement Engg.
2. Kerbs and Walker, Highway Materials.
3. HMSO, Soil Mechanics for Road Engineers.
4. HMSO, Bituminous Materials for Engineers.
5. MOST Standards for Highway constructions.
6. Atkins Harold N., Highway Materials, Soils, and Concrete, Prentice Hall, 1996.
7. IRC: 37-2001, Guidelines for the Design of Flexible Pavements.
8. Kadiyali L. R. and Lal, N. B., Principles & Practice of Highway Engineering, Khanna Publishers, Delhi.
9. Khanna S.K., Justo C.E.G., Highway Engineering, Nem Chand & Bros., Roorkee.
10. Various IRC codes for construction of Bituminous & Concrete Roads.
11. Partho Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI
12. L. J. Pingnataro, Traffic Engineering; Theory and Practice. Prentice Hall, Englewood Cliffs, 1973.
13. M. Wohl and B. V. Martin, Traffic System Analysis for Engineering and Planners, McGraw-Hill. New York,1983.
14. D. R. Drew, Traffic Flow Theory and Control, McGraw Hill. New York 1968.
15. W. R. McShane, R. P. Roess and E. S. Prassas, Traffic Engineering, Prentice Hall, New Jersey, 1990.
16. R. J. Salter, Highway Traffic Analysis and Design, McMillan, Hampshire, 1989.
17. Highway Capacity Manual, Transportation Research Board, Washington D.C., 1997, 2000.
18. James H. Banks, Introduction to Transportation Engineering, WCB-McGraw Hill, New York
19. S. C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.
20. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers.
21. Khanna S.K., Justo C.E.G., Highway Engineering, Nem Chand & Bros., Roorkee.
22. L. Mannering, W. P. Kilareski and S. S. Washburn, Principles of Highway Engineering and Traffic Analysis. Wiley India Pvt. Ltd., New Delhi.
23. E. J. Yoder and M.W.Witczak, Principles of Pavement Design, John Wiley and Sons, New York, 1975.
24. Tang, Pavement Design.
25. Sharma & Shrama, Principles and Practice of Highway Engineering.
26. IRC– 37, 2001, IRC – 58-1998.
27. Y.H.Huang, Pavement Analysis and Design. Prentice Hall, Englewood Cliffs, New Jersey, USA, 1993, ISBN-0-13-655275-7.