First Semester 2015-2016
Course Handout (Part II)

Date: 05.8.2015

In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course No. : CE G535
Course Title : Highway Geometric Design
Instructor In-Charge: Prasanta Kumar Sahu

Course Description:

Geometric design is an aspect of highway design dealing with the visible dimensions of a roadway. It is dictated by the requirements of traffic and usually constrained by economics. The course includes route and layout selection, traffic characteristics, highway capacity and the design elements of horizontal and vertical alignments, sight distances, cross-section components, intersections and interchanges. Keeping in view the fact that vehicular traffic is not the only users of roads, design of bicycle and pedestrian facilities have also been included in the course. It also includes parking and terminal layout and design.

Scope and Objective:

The highway, vehicle and individual users are integral parts of transportation safety and efficiency. The objective of the course is to expose the students to the various components of the geometric design of highways. The scope of the course is restricted to primarily to highways only.

Text Books:

- T1. AASHTO; 2001; *A Policy on Geometric Design of Highways and Streets;* American Association of State Highway and Transportation Officials.

Reference Books:

- R1 Kadiyali L R and Lal N B; 2005; *Principles and Practices of Highway Engineering;* Khanna Publishers, Delhi.

Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Reference* Chap./Sec. # (Book)
1 to 2	Functions of highways	Highway functional classification, functional system characteristics.	Chapter 1/ T1
3 to 4	Design controls and criteria	Design vehicles, minimum turning path, driver performance	Chapter 2/ T1
5 to 9	Traffic characteristics	Volume, directional distribution, traffic composition, speed, highway capacity, levels of service.	Chapter 2/T1
10 to 11	Facilities for pedestrians and bicycles	Walking speed, walkway capacity and bicycle facilities	Chapter 2/T1

12 to 15	Sight distance	Stopping Sight distance, decision sight distance, passing sight distance.	Chapter 3/ T1
16 to 19	Horizontal alignment	Superelevation and its design consideration.	Chapter 3/ T1
20 to 24	Transition design controls	Transition curve, methods of attaining superelevation, Offtracking and widening of roads, sight distance.	Chapter 3/T1
25 to 28	Vertical alignment	Critical length of grades, climbing lanes, design controls of vertical curves: crest and sag.	Chapter 3/T1
29 to 30	Combination of horizontal and vertical curves	Design controls, alignment coordination, drainage, erosion control.	Chapter 3/T1
30 to 31	Cross section elements	Cross slope, lane widths, shoulders, horizontal clearance, crubs.	Chapter 4/T1
32 to 35	At grade intersections	Types, roundabouts, channelizing Islands.	Chapter 9/ T1
36 to 39	Grade separations and interchanges	Types, overpass and underpass; design considerations for interchanges.	Chapter 9/ T1
40 to 41	Expressways	Features, design standards and safety.	Chapter 8/ T1

Evaluation Scheme:

EC No.	Evaluation Component	Duration	Weightage	Date, Time & Venue	Nature of Component
1	Mid-term test	90 min	30	6/10 10:00 - 11:30 AM	Open book examination
2	Comprehensive	3 hours	40	3/12 AN	Close book examination
3	Assignments/ Seminars/ term papers		30		Home assignments, use of softwares, seminars, term paper

Chamber Consultation Hour: ***To be announced in the class***

Notices: ***Watch Civil Engineering Group Notice Board***

Make-up Policy:

1. **Make-up will be granted on a case by case basis only on genuine reasons.**
2. **For medical cases, a certificate from the concerned physician of the Medical Centre must be produced.**

Instructor-in-charge