Syllabus for Diploma Engineering

Civil Engineering

Semester – IV

Subject Name: Highway and Transportation Engineering

Subject Code: 09CI1402

Diploma Branches in which this subject is offered: Civil

Objective: Objectives of introducing this subject at second year level in Civil branch are:

- To understand the design of road network which is safe, economic and time saving for passengers and goods movements.
- To impart the basic knowledge to the civil engineering students on highway planning, Highway material, Transportation engineering and Traffic Engineering.
- To make students able to perform various test related to highway materials.

Credits Earned: 4

Course Outcomes:

After studying this subject student will be able to:

- Understand the properties of the constituent materials used in road construction.
- Understand the basic anatomy of highway construction materials and constituents.
- Understand working and importance of different traffic control devices and carry out intersection design.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
3	0	2	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact hours	Weightage (%)
1	**Introduction – Highway Engineering** • Scope of highway engineering • Highway Classifications	2	5
2	**Highway Development and Planning** • The development of road system in India and abroad • Highway Planning Objectives • Highway Planning in India • Planning Surveys and Interpretation • Types of Pavement and Highway cross section Elements	12	25
3	**Highway Materials** • Material used in Highway Construction • Subgrade Soil- Importance, characteristics, index properties • Aggregate- function, properties and Tests • Binders- types and characteristics, function, test • Recent trends in Highway Material	12	30
4	**Transportation Engineering** • Importance of Transportation • Role of Transportation in National Development • Modes of Transportation with their Advantages and Limitations • Negative impact of Transportation on Environment	8	20
5	**Traffic Engineering** • Elements of Traffic Engineering • Traffic Control Devices (TCD)- Road Sign, Marking, Signals, Traffic Islands and Road Intersections • Road accidents and their remedial measures	8	20

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyse	Evaluate	Create
22%	24%	40%	14 %	0%	0%

Suggested List of Experiments:

Sr. No.	Name of Topics	Contact Hours
1	Aggregate Impact test	2
2	Aggregate Crushing test	2
3	Aggregate Abrasion test	2
4	Penetration Test	2
5	Softening Point test	2
6	Ductility Test	2
7	Viscosity Test	2
8	Marshall Stability Test	2
9	Traffic Volume Count	2

Tutorials:

Sr. No.	Name
1	Highway Development and Planning
2	Highway Materials
3	Transportation Engineering
4	Traffic Engineering

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

d. Students will use supplementary resources such as online videos, videos, e-courses, Virtual Laboratory.

Reference Books:

1. Highway Engineering by S.K. Khanna and C.E.G. Gusto, A.Veeraragavan, Nem Chand and Bros, Roorkee.
2. Traffic Engineering and Transport planning by Dr. L.R. Kadiyali, Khanna Publishers.
3. Highway Engineering by Dr. L.R. Kadiyali, Khanna Publishers
4. Principle and practices of Bridge Engineering by S.P.Brindra, Dhanpat Rai and Sons
5. IRC 67 “Code of Practice for Road Signs”, IRC, New Delhi, 2001.