

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Diploma Engineering			Branch		Civil Engineering		
Semester		IV			Version		1.0.0.0		
Effective from Academic Year			2019-20		Effective for the batch Admitted in			June 2019	
Subject code		1CI2404		Subject Name		Transportation Engineering			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

At diploma level, students are expected to study about these aspects of roads, railways and bridges so as to develop their understanding in order to apply their understanding in order to apply their knowledge in improving civil infrastructure for transportation.

Course Learning Outcomes:

The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:

CO1. Explain various Modes of transportation with components, cross section road alignments.

CO2. Comprehend the concept of construction and maintenance of roads, railways and Bridges.

CO3. Perform the tests on the various materials used in the construction work of roads, Railways and bridges.

CO4. To understanding in order to apply their Knowledge in improving civil infrastructure for transportation.

The practical should be carried out in such a manner that students are able to acquire different learning outcomes from covered course.

Course Content

Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 INTRODUCTION	1.1 Importance of Transportation engineering. 1.2 Mode of Transportation Engineering. 1.3 Classification of Road 1.4 Importance & Advantages of Road Transportation. 1.5 Road alignment and their types, Requirement of good alignment & factors affecting Road alignment 1.6 Engineering Survey Road Location, Map & Drawing Required for Road Project.	1a. Discuss various Modes of transportation 1b. Explain the various Components of a road section. 1c. Demonstrate the basic requirement of road alignment. 1d. Describe various terms used in road geometry.	05	04
UNIT – 2 ROAD GEOMETRIC DESIGN	2.1 Road geometric design and factor affecting Road geometric design. 2.2 Different Cross section of road showing its component as per	2a. Demonstrate the basic requirement of road alignment 2b. Describe various terms used in road geometry	05	07

	<p>IRC.</p> <p>2.3 Function of each component Terms used in road geometry Camber, sight distance, Super elevation, Widening of Road,</p> <p>2.4 Transition curve and Gradient</p>			
UNIT – 3 ROAD CONSTRUCTION AND MAINTENANCE	<p>3.1 Types of Pavement</p> <p>3.2 Necessity of Soil Stabilization and its methods.</p> <p>3.3 Types of materials used in road Construction</p> <p>3.4 Various tests on Aggregate and bitumen</p> <p>3.5 Construction of Flexible and Rigid Pavement.</p> <p>3.6 Types of Failures in roads</p> <p>3.7 Maintenance of roads and its components</p>	<p>3a. Describe various types of road construction methods.</p> <p>3b. Explain various types of failures and maintenance of road.</p> <p>3c. Explain various types of tests on road materials.</p>	10	08
UNIT – 4 ROAD DRAINAGE	<p>4.1 Importance and Purpose of Drainage</p> <p>4.2 Methods and Construction surface & Subsurface drainage</p> <p>4.3 Maintenance of drainage System</p>	4a. Explain importance of drainage and its maintenance	05	03
UNIT – 5 INTRODUCTION OF RAILWAY ENGINEERING	<p>5.1 Cross- section of various Permanent way and Functions of Various Component</p> <p>5.2 Methods fixing of Rail with Sleeper.</p> <p>5.3 Rail joints, Types of Railway gauge and Uniformity of gauge</p>	<p>5a. Describe the basic parts of railway track and its functions.</p> <p>5b. Explain the Joints and Gauge.</p> <p>5c. Explain basic knowledge of points and Crossing.</p>	05	04
UNIT – 6 RAILWAY POINT CROSSING AND YARDS	<p>6.1 Point Crossing and factors affecting of Point crossing.</p> <p>6.2 Turn out and types of Crossing</p> <p>6.3 Classification and Functions of Yards</p>	6a. Discuss the function of various yards.	10	05
UNIT – 7 RAILWAY TRACK MAINTENANCE	<p>7.1 Requirement of Track Maintenance</p> <p>7.2 Daily and periodical Maintenance</p> <p>7.3 Maintenance of Alignment, Drainage, Track Material and its components, Point and crossing and level crossing</p>	7a. Explain requirement of track Maintenance	05	05
UNIT – 8 INTRODUCTION AND INVESTIGATION OF BRIDGE	<p>8.1 Components Bridge Engineering</p> <p>8.2 Classification of Bridge</p> <p>8.3 Site selection of bridge</p> <p>8.4 Requirement of an ideal bridge</p> <p>8.5 Types of Bridge alignment</p> <p>8.6 Technical term: Scour, Afflux, Run- off, Economic Span, Clearance, Free board</p>	<p>8a. Discuss the function of various parts of bridge.</p> <p>8b. Explain terms related to bridge.</p> <p>8c. Explain requirement of an ideal bridge</p>	10	05

UNIT – 9 MAINTENANCE OF BRIDGE	9.1 Defects In Bridge 9.2 Inspection of Bridge and Preparation of Inspection Report of Bridge 9.3 Maintenance of Steel Bridge, Masonry Bridge, Cause Way, Piers, Pile bents, Abutment, Wing Wall, Road Surface, Drainage, Parapet Wall and Bearing	9a. Carry out the maintenance report	05	04
	Total		60	45

List of Practical		
No.	Unit	Name of Practical
1	I	Draw the dimensional sketches of cross section of road (with function of each part of road) , road junction, road curve and widening
2	II	Carry out the following tests. - On Aggregate 1. Impact test. 2. Crushing test. 3. C B R test. - On Bitumen 1. Flash & Fire test. 2. Softening point 3. Penetration test
3	III	Draw the dimensional sketches of cross section of permanent way & points & crossing (with function of each part of road)
4	IV	Prepare a brief report after visit to Railway track & yards
5	V	Draw the sketches of various bridges after visiting the bridges in nearby locations.

List of Instruments / Equipment / Trainer Board	
1	UTI/ Compression testing machine capacity – 40 tonne
2	Sets of sieve and sieve shaker
3	Abrasion testing machine with balls
4	Impact machine
5	Weighing machine of required capacity.
6	Penotrometer for bitumen testing
7	C.B.R. testing machine
8	Pensky-martens closed tester
9	Ring and ball apparatus

List of Reference Books

No	Title of Reference Books	Authors	Publication
1	Highway Engineering	S.K.Khanna & Justo	Khanna publication, Delhi
2	Highway Engineering	L.R. Kadiyali	Charotar Publication, Anand
3	Highway Engineering	S. C. Rangwala	Charotar Publication, Anand
4	Transport engineering	Vazirani & Chandola	
5	Road Railway Bridges & Tunnel Engineering	T. D. Ahuja & Birdie	Standard Publication
6	Road Railway Bridges & Tunnel Engineering	B.L. Gupta & A. K. Gupta	Standard Publication

Link of Learning Web Resource

1	www.waterbouw.tudelft.nl/
2	www.shiksha.com , IIT, Roorkee
3	www.Indianrail.com

PO & CO Mapping

Sr.No.	Name of PO	Description	Co1	Co2	Co3	Co4
1	PO 1	Acquire fundamental knowledge of mathematics, science, and civil engineering.	Moderate	Moderate	Moderate	Slight
2	PO 2	Design and conduct experiments, as well as analyze and interpret data.	Slight	Slight	Moderate	Moderate
3	PO 3	Use the techniques, skills, and modern engineering tools necessary for engineering practice	Moderate	Moderate	Moderate	Slight
4	PO 4	Function in multi-disciplinary teams and identify, formulate, and solve engineering problems.	Slight	Slight	Slight	Slight
5	PO 5	Clear understanding of his duties and responsibilities as a civil engineer.	Slight	Slight	Slight	Moderate
6	PO 6	Develop effective communication skill and provide leadership for professional development.	Moderate	Slight	Slight	Moderate
7	PO 7	Engage in life-long learning in civil engineering field and comprehend issues related to environment and sustainable development.	Moderate	Moderate	Slight	Slight
8	PO 8	Graduate will demonstrate knowledge of professional and ethical responsibilities.	Moderate	Slight	Moderate	Slight
9	PO 9	Incorporate economics and business practice including project and risk management.	None	Slight	Slight	Moderate
10	PO 10	Graduated are able to share their knowledge to the industries as well as society.	Moderate	Slight	Slight	Slight
11	PO 11	Graduated will be able to apply their skill and knowledge for the sustainable development of nation.	Moderate	Slight	Slight	Slight
12	PO 12	Graduated are able to learn to work with with the team and also with the inter discipliners.	Moderate	Slight	Slight	Moderate

