



# ASIAN SCHOOL OF TECHNOLOGY, BHUBANESWAR

## DEPARTMENT OF CIVIL ENGINEERING

### LESSON PLAN

Discipline: Civil engineering	Semester : 3 <sup>rd</sup>	No. of periods available: 51	Name of Teaching Faculty: Santosh Kumar Behera
Subject: Transportation Engineering	No. of Days/ per week class allotted : 4 periods per week		No. of weeks : 13
Week	Class Day		Topics to be covered
1 <sup>st</sup>	1 <sup>st</sup>	1	Role of transportation in development of a nation
	2 <sup>nd</sup>	1	Scope and importance of roads in india and its characteristics.
	3 <sup>rd</sup>	1	Different modes of Transportation.
	4 <sup>th</sup>	1	General classification of roads
2 <sup>nd</sup>	5 <sup>th</sup>	1	Road allingment and selection factor affecting road allingment.
	6 <sup>th</sup>	1	Cross sectional elements of road and standards cross sections of national highway in embankment and cutting.
	7 <sup>th</sup>	1	Camber and Gradient : Definition , purpose, types as per IRC recommendation.
	8 <sup>th</sup>	1	Sight Distance (SSD): Definition , types IRC recommendation.
3 <sup>rd</sup>	9 <sup>th</sup>	1	Numericals on sight distance.
	10 <sup>th</sup>	1	Curves : Necessity, types: Horizontal and vertical curves.
	11 <sup>th</sup>	1	Extra widening of roads : numerical examples.
	12 <sup>th</sup>	1	Superelevation: Defination, Formula

			for calculating maximum and minimum super elevation.
4 <sup>th</sup>	13 <sup>th</sup>	1	Numericals on super elevation.
	14 <sup>th</sup>	1	Methods of providing super elevation.
	15 <sup>th</sup>	1	Numerical practice on super elevation and sight distance.
	16 <sup>th</sup>	1	Types of road materials, their types and properties.
5 <sup>th</sup>	17 <sup>th</sup>	1	Tests on aggregates – Flakiness and elongation index test, angularity number test.
	18 <sup>th</sup>	1	Tests on bitumen- Penetration, Ductility, Flash and fire point test and softening point test.
	19 <sup>th</sup>	1	Pavement definition, types structural components of pavement and their functions.
	20 <sup>th</sup>	1	Construction of WBM road, Merits and Demerits of WBM and WMM roads.
6 <sup>th</sup>	21 <sup>st</sup>	1	Construction of flexible pavement.
	22 <sup>nd</sup>	1	Terms used in BR prime coat, tack coat, seal coat, Merits and Demerits of BR.
	23 <sup>rd</sup>	1	Cement concrete road- methods of construction, alternate and Continuous bay method.
	24 <sup>th</sup>	1	Construction joints, fillers and sealers, merits and demerits of concrete road. Types of joint.
7 <sup>th</sup>	25 <sup>th</sup>	1	Revision and general discussion on road construction and pavement materials.
	26 <sup>th</sup>	1	Classification of indian railways and Zones of

			indian railways.
	27 <sup>th</sup>	1	Permanent way : Ideal requirements, components, Railway gauges types and factors affecting selection of gauge.
	28 <sup>th</sup>	1	Rail, rail joints – requirements, types.
8 <sup>th</sup>	29 <sup>th</sup>	1	Creep of rail : causes and prevention.
	30 <sup>th</sup>	1	Sleepers – functions and requirements, types – concrete sleepers and their density.
	31 <sup>st</sup>	1	Ballast – Function and types , suitability.
	32 <sup>nd</sup>	1	Rail fixtures and fastenings- fish plate, spikes, bolts and keys, bearing plates, chairs type anchors and anti creepers.
9 <sup>th</sup>	33 <sup>rd</sup>	1	Railway alignment: Factors governing rail alignment. Gradient, curves – types and factors affecting, grade compensation.
	34 <sup>th</sup>	1	Track cross sections- standard cross section of single and double line in cutting and embankment
	35 <sup>th</sup>	1	Super elevation, limit of superelevation on curves.
	36 <sup>th</sup>	1	Cant deficiency, negative cant, coning of wheels and side train.
10 <sup>th</sup>	37 <sup>th</sup>	1	Turn out _ types, components, functions on inspections.
	38 <sup>th</sup>	1	Types of points and crossing.
	39 <sup>th</sup>	1	Station- Purpose, requirements of railway station, important technical terms, types of railway station, factors affecting site selection for railway

			station.
	40	1	Station yard : Classification- Passenger, goods, locomotives and marshaling yards. Function and drawbacks of marshaling yards.
11 <sup>th</sup>	41 <sup>st</sup>	1	Track maintainance- Necessity and function.
	42 <sup>nd</sup>	1	Tools required for track maintainance and their functions.
	43 <sup>rd</sup>	1	Organization of track maintainance, Duties of permanent way inspector, gangmate and keyman.
	44 <sup>th</sup>	1	Revision on indian railway.
12 <sup>th</sup>	45 <sup>th</sup>	1	Revision on indian railway.