SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of **Civil Engineering**	LP: CE 18505 Rev. No:00 Date: 25/07/2022
B.E/B.Tech/M.E/M.Tech : **B.E.** Regulation : **R2018 (Autonomous)** PG Specialisation : NA Sub. Code / Sub. Name : ***CE 18505 TRANSPORTATION ENGINEERING II*** Unit I : ***RAILWAY PLANNING***	

Unit Syllabus:

Significance of Road, Rail, Air and Water transports - Coordination of all modes to achieve sustainability - Elements of Permanent Way [PW] – Rails, Sleepers, Ballast, rail fixtures and fastenings, - Track Stress, Coning of Wheels, Creep in rails, defects in rails – Route alignment surveys, conventional and modern methods- - Soil suitability analysis - Geometric design of railways, gradient, Superelevation, widening of gauge on curves- Points and Crossings.

Objective:

To expose the students to Railway planning, design, construction and maintenance and planning and design principles of Airports and Harbours.

*Session No **	*Topics to be covered*	*Ref*	*Teaching Aids*
01	Introduction; Objectives; COs, References; Time Table, Evaluation pattern, Significance of Rail, Air, Road and Water Transportation	2-Ch.1; pp.6	PPT
02	Meaning of Sustainability; Different types of modes; Coordination plan to achieve sustainability; Elements of *PW*- (Exe. Modeling of PW)	Net; 1-Ch.3; pp.3.1	PPT
03	(Remind: Modeling of PW) Rails: Introduction, Functions of Rails; Requirements; Types of rail sections; Length of Rails; Kinks in Rails; Buckling of Rails; (Exe. Metro Rail system (section)-Google)	1-Ch.6; pp.6.1-6.10	PPT
04	(Remind: Metro Rail system (section)); Sleepers-Types; Sleeper Density (Exe: Table 9.3 (ref.1) Identify suitability for India); Ballast-Requirements; Types (list)	1-Ch.9;pp.9.2-9.18	PPT
05	Rail Fixtures and Fastenings-Fish Plates (requirements; Section);Spikes (requirements; Types (pictures)); Bolts (Types with pictures); Cast Iron Chair (picture) ; Keys (advantages of Morgan key)	1-Ch.10; pp.10.1-10.13	PPT
06	Track Stresses-discuss eight points; Creep in Rail (definition; effects of creep; measurement of creep; remedies)	1-Ch.4; pp.4.3 & 1-Ch.8; pp.8.1-8.5	PPT
07	Coning of Wheels; Route alignment surveys (2 min); Gradient-types of Gradients (short); Superelevation-Introduction	1-Ch.3; pp.3.7-3.8; 1-Ch.15; pp.15.1-15.43;	PPT
08	Superelevation-derivation; Negative SE	1-Ch.15; pp.15.1-15.43;	PPT
09	(Remind: Table 9.3 (ref.1) Identify suitability for India) SE Problems	1-Ch.15; pp.15.1-15.43;	PPT
10	Points and Crossings-Turnouts (explain with picture); Crossings (explain with picture)	1-Ch.16; pp. 16.21	PPT

Content beyond syllabus covered (if any):
Metro Rail system (rail section only)

* Session duration: 50 minutes

Sub. Code / Sub. Name: ***CE 18505 TRANSPORTATION ENGINEERING II***

Unit : II ***RAILWAY CONSTRUCTION AND MAINTENANCE***

Unit Syllabus:

Earth work – Stabilization of Track on poor soil – Tunneling methods, drainage and ventilation – Calculation of materials required for track laying – Construction and Maintenance of tracks – Modern methods of construction and maintenance – Railway Station and Yards and Passenger Amenities – Urban Rail – Infrastructure for metro, mono and underground railways

Objective:

To expose the students to Railway planning, design, construction and maintenance and planning and design principles of Airports and Harbours.

*Session No **	*Topics to be covered*	*Ref*	*Teaching Aids*
11	Earth work (soil stabilization – ref. soil mechanics); Tunneling Methods (2 methods)	1-Ch.22; pp.22.1; 1-	PPT
12	Tunnel Ventilation; Drainage	1-Ch.27; pp.27.16 - 27.18	PPT
13	Materials required for track laying	1-Ch.22; pp.22.6	PPT
14	*Track Maintenance (modern methods)*: Introduction; Mechanised Maintenance; Need/ requirement for Mechanised Maintenance (4 points each); Methods of mechanical Tamping (off-track tamping)	1-Ch.31; pp.31.1-31.19	PPT
15	*Track Maintenance (modern methods)*: Methods of mechanical Tamping (on-track tamping-Light on-track, heavy on-track); Measured Shovel Packing (MSP-merits, demerits)	1-Ch.31; pp.31.1-31.19	PPT
16	*Track Maintenance (modern methods)*: Measured Shovel Packing (MSP-procedure); DTM (Introduction only)	1-Ch.31; pp.31.1-31.19	PPT
17	Railway Station-& Yards: Site Selection (9 points); Classification of Railway Station (? Block Station; ? Non-block Stations; Junction Station; Terminal Station)	1-Ch.18; pp.18.1-18.10	PPT
18	Railway Station & Yards: Types of Yards (passenger bogie yard; Goods Yard; Marshalling yard (Type-Flat/Gravitational/Hump)	1-Ch.18; pp.18.14-18.17	PPT
19	Underground railways (advantages, limitations only); monorail (29.1.7); Chennai Metro Rail details	2-Ch.29; pp.521-523.	PPT
Content beyond syllabus covered (if any): Visit to Southern Railways Civil Engineering Training Centre/ Tambaram			

* Session duration: 50 minutes

Sub. Code / Sub. Name: ***CE 18505 TRANSPORTATION ENGINEERING II***

Unit : III ***AIRPORT PLANNING***

Unit Syllabus:

Air transport characteristics – airport classification – Airport Planning: Objectives, components, layout characteristics, socio-economic characteristics of the catchment area, criteria airport site selection and ICAO stipulation, typical airport layouts, case studies, parking and circulation area

Objective:

To expose the students to Railway planning, design, construction and maintenance and planning and design principles of Airports and Harbours.

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

*Session No **	*Topics to be covered*	*Ref*	*Teaching Aids*
20	Air Transport (*advantages & Limitations*); Airport Classification	3-Ch.1; pp.3-4; 3-Ch.6; pp.186-187	PPT
21	Airport Planning: General, Airport Master Plan, ICAO Recommendations	3-Ch.4; pp.121- 149	PPT
22	Airport Planning: Regional Planning, data required before site selection	3-Ch.4; pp.121- 149	PPT
23	Airport Planning: Airport Site Selection (13 points)	3-Ch.4; pp.121- 149	PPT
24	Airport Planning: Estimation of future air traffic needs (brief)	3-Ch.4; pp.121- 149	PPT
25	Airport Planning: Airport Layout (picture);	3-Ch.11; pp.377-380	PPT
26	Vehicular Circulation and Parking Area; Apron	3-Ch.11; pp.385-387	PPT
27	Basic Parking Configurations: Number of gate positions, Aircraft parking system;	3-Ch.11; pp.388-391	PPT
Content beyond syllabus covered (if any): Nil			

Sub. Code / Sub. Name: ***CE 18505 TRANSPORTATION ENGINEERING II***

Unit : IV ***AIRPORT DESIGN***

Unit Syllabus:

Runway Design: Orientation, Wind Rose Diagram – Runway length – problems on basic and actual length, geometric design of runway, configuration and pavement design principles – Elements of taxiway design – airport zones – passenger facilities and services – runway and taxiway marking and lighting

Objective:

To expose the students to Railway planning, design, construction and maintenance and planning and design principles of Airports and Harbours.

*Session No **	*Topics to be covered*	*Ref*	*Teaching Aids*
28	*Runway Design*: Runway Orientation, cross wind component and wind coverage, wind rose	3-Ch.6; pp.164-198	PPT
29	*Runway Design*: Type I wind rose diagram, Type II wind rose diagram	3-Ch.6; pp.164-198	PPT
30	*Airport Runway*: basic runway length, correction for elevation, temperature, gradient	3-Ch.6; pp.164-198	PPT
31		3-Ch.6; pp.164-198	PPT
32	Problems on runway length	3-Ch.6; pp.164-198	PPT
33	Airport configuration, Taxiway Design (27 slides available):	3-Ch.7; pp.224; 3-Ch.8; pp.231-251	PPT
34	Runway and taxiway marking and lighting (37 slides)	3-Ch.12; pp.406-423	PPT
35	Runway and taxiway marking and lighting (37 slides)	3-Ch.12; pp.406-423	PPT
Content beyond syllabus covered (if any): Plan to visit to Chennai Airport			

Sub. Code / Sub. Name: ***CE 18505 TRANSPORTATION ENGINEERING II***

Unit : V ***HARBOUR ENGINEERING***

Unit Syllabus:

Definition of basic terms: Harbour, port, satellite port, docks, waves and tides – planning and design of harbours: Requirements, classification, location and design principles – Harbour layouts and terminal facilities – coastal structures: piers, break waters, wharves, jetties, quays, spring fenders, dolphins and floating landing stage – Inland Water Transport (ITW) – Wave action on coastal structures and coastal protection works – Environmental concern of port operations – coastal regulation zone, 2011

Objective:

To expose the students to Railway planning, design, construction and maintenance and planning and design principles of Airports and Harbours.

*Session No **	*Topics to be covered*	*Ref*	*Teaching Aids*
36	Definition of basic terms: Harbour, port, satellite port (net), docks, waves and tides	4-Ch.2; pp.27; 4-Ch.3; pp.61&76	PPT
37	planning and design of harbours : Harbours, Requirement of a harbor, classification	4-Ch.2; pp.29-33	PPT
38	Components of a harbor (pp.42); coastal structures: Definitions (15 definitions);	4-Ch.4; pp.91-93	PPT
39	*Breakwaters*: Introduction, broad classification only (pg.100) .	4-Ch.4; pp.97-111	PPT
40	Jetty, Dock fenders (broad classifications)	4-Ch.4; pp.111-118	PPT
41	Piers; Wharves (broad classification)	4-Ch.4; pp.118-124	PPT
42	Dolphins; Coastal Protection (Brief)	4-Ch.4; pp.125-126; 4-Ch.10; pp.216-224	PPT
43	Inland Water Transportation (ITW)	4-Ch.1; pp.7-11;	PPT
44	Coastal Regulation Zone 2011	Net	PPT
45	Revision	--	PPT
Content beyond syllabus covered (if any): Plan to visit to Chennai Port			
Sub Code / Sub Name: ***CE 18505 TRANSPORTATION ENGINEERING II***			

REFERENCES:

1. **Saxena Subhash C and Satyapal Arora**, "A Course in Railway Engineering", Dhanpat Rai and Sons, Delhi, 2003
2. **Satish Chandra and Agarwal M.M**, "Railway Engineering", 2nd Edition, Oxford University Press, New Delhi, 2013.
3. **Khanna S K, Arora M G and Jain S S**, "Airport Planning and Design", Nemchand and Brothers, Roorkee, 2012.
4. **Bindra S P**, "A Course in Docks and Harbour Engineering", Dhanpat Rai and Sons, New Delhi, 2013

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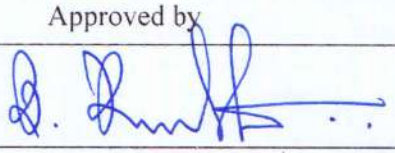
Signature		
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Date	25/07/2022	25/07/2022