

For Lecturers in **B. Tech. Civil Engineering VIIIth Semester**

Course No.		Title of the Course	Course Structure	
EL-427A		Railway Engineering	L-T-P	3-0-0
COURSE OUTCOMES (CO)				
CO1	Students will be able to study about permanent way and different types of rails			
CO2	Students will be able to study different types of Sleepers, fastenings and Ballast			
CO3	Students will be able to learn about Points and crossings, signaling and interlocking system			
CO4	Students will be able to learn geometric design of Rails and stations			
UNIT NO`	Topics To Be Covered		Lecture Nos	
	Introduction to EL-427A Railway Engineering (Co, PO, Syllabus)		1.	
I	Rail transportation and its importance in India		2.	
	Permanent way: requirements and components		3.	
	Gauges in India and abroad. Selection of gauge.		4.	
	Coning of wheels. Adzing of sleepers		5.	
	Rails: functions, composition of rail steel		6.	
	types of rail sections, requirements of an ideal rail section, length of rails		7.	
	Defects in rails. Creep of rails		8.	
	Long welded rails and continuously welded rails		9.	
	Revision		10.	
II	Sleepers: functions, requirements of an ideal sleeper		11.	
	Types of sleepers: wooden, cast iron, steel and concrete sleepers, advantages, disadvantages and suitability of each type		12.	
	Sleeper density		13.	
	Fastenings for various types of sleepers: fish plates, spikes, bolts, bearing plates, keys, chairs, jaws, tie bars. Elastic fastenings		14.	
	Ballast: functions, requirements, types of ballast and their suitability.		15.	
	Revision		16.	
III	Necessity. Turnout: various components, working principle		17.	
	Switch: components, types. Crossing: components and types		18.	
	Design elements of a turnout, design of a simple turnout		19.	
	Layout plan of track junctions: crossovers, diamond crossing		20.	
	single double slips, throw switch, turntable, triangle		21.	
	Signals: objects, types and classification.		22.	
	Semaphore signal: components, working principle		23.	
	Requirements / principles of a good interlocking system		24.	
	Brief introduction to devices used in interlocking		25.	
	Methods of control of train movements: absolute block system, automatic block system		26.	
	centralized train control and automatic train control systems		27.	

	Revision	28.
IV	Gradients, grade compensation	29.
	Super elevation, cant deficiency, negative super elevation	30.
	Maximum permissible speed on curves	31.
	Tractive resistances, types.	32.
	Hauling capacity of a locomotive.	33.
	Stations: functions and classification	34.
	Junction, non junction and terminal stations	35.
	Yards: functions, types. Marshalling yard: functions, types	36.
	Maintenance of railway track: necessity, types of maintenance	37.
	Brief introduction to mechanized maintenance, M.S.P and D.T.M.	38.
Revision	39.	

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