Lesson Plan

**Name of the Faculty : DR.SANJAY GUPTA**

**Discipline : Automobile Engg.**

**Semester : VIth**

**Subject : TRACTOR AND SPECIAL PURPOSE VEHICLES**

**LessonPlan Duration : 38 lectures**

**Work Load Lecture per week (in hours):** 03 HOURS (theory)

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| **Week** | **Theory** |  |  |
| **Lecture day** | **Topic (including assignment/ test)** |  |  |
| **1st** | **1** | **UNIT-I- Tractor Fundamentals**Definition; Classification of tractors according to – horse power, running gear, purpose, power source,drive wheels; Characteristics and uses of - general purpose tractor. |  |  |
| **2** | Row crop tractor, power tiller, other special purpose tractors; Major assemblies of tractor and their functions. |  |  |
| **3** | Basics trends in tractor design;Applications of tractors;  |  |  |
| **2nd** | **4** | Drawbar Pull, Rolling Resistance & Tractive Effort; Weight transfer concept. |  |  |
| **5** | Types of transmission boxes used in tractors; Final drive reduction gear – bull gear type |  |  |
| **6** | Planetary type; Tractor brake system – oil immersed disc brakes; |  |  |
| **3rd** | **7** | **UNIT-II-****Supplementary Systems-**Power take off shaft; Types of PTO shaft; Types of PTO drive -  |  |  |
| **8** | Transmission drive PTO, Independent drive PTO, Continuously drive PTO (Live PTO); |  |  |
| **9** | Belt pulley drive; Three point linkages; Types of drawbar: fixed, swinging, 3-point linkage drawbar; |  |  |
| **4th** | **10** | Tractor hitching system – Trailed, semi-mounted,fully mounted; |  |  |
| **11** | Differential lock: necessity and method of operation;  |  |  |
| **12** | REVISION |  |  |
| **5th** | **13** | **1st Sessional Test** |  |  |
| **14** | Description of dog clutch type differential lock. |  |  |
| **15** | **UNIT-III****Hydraulic system-**Principle and Functions of hydraulic system, Hydraulic system layout and working;  |  |  |
| **6th** | **16** | Various components of hydraulic system, their types, and their working |  |  |
| **17** | Reservoir, hydraulic pump, direction flow control valve, power cylinder; Various control systems |  |  |
| **18** | REVISION |  |  |
| **7th** | **19** |  |  |  |
| **20** | Depth control, position control, draft control, combination control. |  |  |
| **21** | Working of hydraulic control levers; Other uses of hydraulic control system. |  |  |
| **8th** | **22** | **UNIT-IV****Tractor Wheels and Tyres-**Function of tyres; Salient features of tractor wheels & tyres; |  |  |
| **23** | Definition of wheel base, wheel tracks and ground clearance; |  |  |
| **24** | Classification of tractor tyres according to - tyre pressure, type of tread, application; |  |  |
| **9th** | **25** | Specifications of front and rear tyres; dual tyre and tandem tyre arrangements. |  |  |
| **26** | **Tractor Comfort & Safety**Human factors considered while designing a tractor; Operator’s seat design; Tractor stability longitudinal. |  |  |
| **27** | lateral stability; Tractor safety – color codes, symbols, Roll-Over Protection System(ROPS), PTO shield. |  |  |
| **10th** | **28** | Seat belt; Safe tractor operating procedure.**Tractor Operation, Maintenance & Repair-**Common controls and levers; |  |  |
| **29** | Maintenance checks before starting the engine; Periodic maintenanceprocedure of tractor; |  |  |
| **30** | Common faults and their rectification; Prominent makes of Indian tractors,Selection criteria for tractor. |  |  |
| **11th** | **31** | REVISION |  |  |
| **32** | **2nd Sessional Test** |  |  |
| **33** | **UNIT-V****Special Purpose Vehicles**Earth Moving Machinery – definition, classification; |  |  |
| **12th** | **34** | General layout and classification of earth moving machinery; Layout, working and applications of: Tipper, Dozer, Loader, |  |  |
| **35** | General layout and classification of earth moving machinery; Layout, working and applications of: Excavator, Motor grader, ForkLift Truck, |  |  |
| **36** | Mobile Crane; Definition of crane terms – derricking, hoisting, slewing. |  |  |
| **13th** | **37** | REVISION |  |  |
| **38** | **3rd Sessional Test** |  |  |
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