

# 20FM009 TRACTOR CONTROL SYSTEMS DESIGN

Hours Per Week :

L	T	P	C
2	1	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	-	36	-	-	-	-	-	-

### Course Description and Objectives:

- To acquaint and equip with the latest design procedures of tractor and its systems.

### Course Outcomes:

At the completion of the course the student will:

- have knowledge and skills on power transmission system of a tractor
- know the design procedures of hydraulic systems and steering system.
- understand design features and selection of engine for tractor.
- know the testing procedures for tractor
- knowing the design of engine components
- knowledge and skills on, hydraulic, pumps used in machinery.
- knowledge on different kinds of valves.
- skills on trouble shooting in valves.
- knowledge on safety features and service requirements of various hydraulic and pneumatic circuits

### SKILLS:

- ✓ Design hydraulic system for tractor
- ✓ Design ergonomical seat for agricultural tractor

**ACTIVITIES:**

- Collection of requisite parameters for design of hydraulic system for tractor
- Collection of relevant data for ergonomical design of seat of agricultural

**UNIT – I**

Technical specifications of tractors available in India, modern trends in tractor design and development, special design features of tractors in relation to Indian agriculture.

**UNIT – II**

Engine performance. Selection of engine for tractors. Design of principal engine components. Design of engine systems. Parameters affecting design of tractor engine and their selection.

**UNIT – III**

Hydraulic system & hitching, chassis, Tractor stability analysis. Single and three point hitch systems. Drawbar performance. Quick attaching couplers.

**UNIT – IV**

Tractor clutches and brakes. Design of power transmission systems. Power measurement of tractor, Tire selection

**UNIT – V**

Design and performance evaluation of traction and transport devices. Human factors engineering in tractor design. Driver's seat, work-place area and controls. Computer application and automation in tractor design

**Text books:**

1. Barger EL, Liljedahl JB & McKibben EC. 1967. *Tractors and their Power Units*. Wiley Eastern.
2. Macmillan RH. *The Mechanics of Tractor - Implement Performance, Theory and Worked Example*. University of Melbourne.

**Reference books:**

1. Maleev VL. 1945. *Internal Combustion Engines*. McGraw Hill.
2. Ralph Alcock 1986. *Tractor Implements System*. AVI Publ. Co.
3. Arthur W Judge 1967. *High Speed Diesel Engines*. Chapman & Hall.