

AE-422: Tractors and Farm Equipment and Off-Road Vehicles										
L	T	P	Credit	Area		CWS	PRS	MTE	ETE	PRE
3	0/1	2/0	4	DEC		15/25	25/-	20/25	40/50	-

Objectives: This course introduces to general design of tractors, farm equipments; engine framework, off road vehicles and maintenance machines

AE-422: Tractors and Farm Equipment and Off-Road Vehicles		Contact Hours
Unit-1	General Design of Tractors: Classification of Tractors-Main Components of Tractor-Safety Rules. Control of the Tractor and Fundamentals of Engine Operation: Tractor Controls and the Starting of the Tractor Engines-Basic Notions and Definition-Engine Cycles Operation of Multi cylinder Engines-General Engine Design - Basic Engine Performance Characteristics	8
Unit-2	Engine Frame Work and Valve Mechanism of Tractor: Cylinder and Pistons-Connecting Rods and Crank shafts Engine Balancing – Construction and Operation of the Valve Mechanism-Valve Mechanism Components – Valve Mechanism Troubles. Cooling System,	6
Unit-3	Lubrication System and Fuel System of A Tractor: Cooling System – Classification – Liquid Cooling System – Components, Lubricating System Servicing and Troubles – Air Cleaner and Turbo Charger – Fuel Tanks and Filters –Fuel Pumps	6
Unit-4	Farm Equipment's: Working Attachment of Tractors-Farm Equipment – Classification – Auxiliary Equipment – Trailers and Body Tipping Mechanism	8
Unit-5	Introduction of off-Road Vehicles: Classification of off-Road Vehicles and their Application Excavator: Different Types of Shovel and Dragline, Their Construction, Operating Principles, Operating Cycles. Production Capacity and cost of Production Transport Equipment: Various Types of Dumpers, Main System, Components and Carrying Capacity of Dumper	8
Unit-6	Road Making and Maintenance Machines: Different Types of Dozer, Grader, and Their Construction. Operating Principles, Production Capacity and Application Mechanism. Other Equipment: Scraper and Front-End Loader, Their Construction and Operation Maintenance: Maintenance Aspect of off Road Vehicles	6
	Total	42

Reference Books:

1	Abrosimov, K. Bran Berg, A and Katayer, K. Road Making Machinery, M I R. Publishers Moscow. 1971
2	De, A. Latest Development of Heavy Earth Moving Machinery, Annapurna Publishers, Dhanbad 1995
3	Nichols, Herber L (Jr.), Moving the Earth, Galgotia Publishing House, New Delhi, 1962
4	Rudnev, V. K. , Digging of Soils by Earthmover With Power Parts, Oxanian Press Pvt. Ltd., New Delhi
5	Rodichev and G.Rodicheva, Tractor and Automobiles, Mir Publishers, 1987
6	Kolchin. A., and V.Demidov Design of Automotive Engines for Tractor, Mir Publishers, 1972

Course Outcomes

CO1	To study basic of Tractors, classification and its components.
CO2	To discuss engine components and its mechanism.
CO3	To explain lubrication system and fuel system of a tractor
CO4	To analyze Working Attachment of Tractors-Farm Equipment
CO5	To implement off-Road Vehicles and their Application Excavator
CO6	To apply Road Making and Maintenance Machines, Maintenance Aspect of off-Road Vehicles.

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2