IV Year I I - Semester	L	T	P	To	C
	4	0	-	4	4

AG418 Environmental Engineering

Course Description & Objectives:

To understand nature, biodiversity, natural resources and facts about the environment and their interrelationships.

Course Outcomes:

On completion of the course, students will be able to:

1. *get fundamental concepts of environmental science*
2. *familiarize himself to protect the environment for better public utilization.*
3. *find and implement scientific, technological, economic and political solutions to environmental problems.*

Unit 1: Introduction to Water Supply System:

Importance of safe water supply system. Domestic water requirements for urban and rural areas.

Unit II: Water Supply:

Sources of Water supply. Intakes and transportation of water. Drinking water quality. Indian Standards of drinking water.

Unit III: Water Treatment:

Introduction to water treatment. Importance of sanitation. Domestic waste water: quantity, characteristics, disposal in urban and rural areas.

Unit IV: Design of Waster water:

Sewer: types, design discharge and hydraulic design. Introduction to domestic wastewater treatment. Design of septic tank. Solid waste: quantity, characteristics and disposal for urban and rural areas.

Unit V: Air Pollution:

Introduction to air pollution. Types of pollutants properties and their effects on living beings. ISI standards for pollutants in air and their abetments. Imparting awareness of domestic sanitation in women.

TEXT BOOKS:

1. Garg, S.K. (1992). *Environmental Engineering (vol 1) Water supply Engineering.* (Vol. 1). Khanna Publishers,Delhi.
2. Metcalf and Eddy. (1997). *Waste Water Engineering Treatment, Disposal, reuse.* Tata Mc Graw Hill Publishing Co. Ltd. New Delhi.

REFERENCES:

1 Peavy, H.S., Rowe, D.R. and Tchobanoglous, G.C. (1986). *Environmental Engineering.* Mc Graw Hill Book Co., New York.

2. Rangwala, S.C. (1992). *Water Supply and Sanitary Engineering.* Charotar Publishing House, Anand.

IV Year I I - Semester	L	T	P	To	C
	4	0	-	4	4

AG412 Biomass Management for Fodder and Energy

Course Description & Objectives:

To impart the fundamental knowledge on the importance of Bio resources, Bio energy and reactors.

Course Outcomes:

At the completion of the course the student will have:

1. *knowledge and skills on bio energy source technology*
2. *understanding of important of biomass in agriculture fields.*
3. *knowledge on alcohol and ethanol production and energy and environment management.*
4. *skill about residue manage*ment in agriculture fields.

Unit 1: Introduction to Biomass:

Introduction to biomass management, biomass resource assessment management techniques/supply chains,

Unit II: Production of Biomass:

Processing of paddy straw, densification- Extrusion process, pellets, mills and cubers, Bailing-classification, uses;

Unit III: Residue Management for Soil Conservation:

Residue management for surface mulch and soil incorporation, Paddy Straw choppers and spreaders as an attachment to combine Harvester, Mulch seeder,

Unit IV: Fodder Management:

Paddy Straw Chopper-cum-Loader, Balar for collection of straw; Processing of straw/ fodder for animal use;

Unit V: Use of Biomass in other Production:

Agricultural and horticultural use, cushioning material for fruits and vegetables, Mulching and Composting, Paper and cardboard manufacturing, Straw as a fuel.