IV Year I I - Semester	L	T	P	To	C
	3	1	-	4	4

AG410 Gully and Ravine Control Structures

Course Description & Objectives:

To expose the student with the fundamental knowledge of flood and their impact on the natural resources. To provide the basic knowledge to analyse the flood data with different hydrological and meteorology data.

Course Outcomes:

At the completion of the course the student will:

1. *have knowledge of flood and flood related problem specially soil erosion and damage of crop*
2. *have the techniques in estimating the flood during peak seasons.*
3. *know how to perform the flood routing.*
4. *have the knowledge in proper design of flood storage structure to prevented soil erosion.*
5. *know planning for flood control methods and their economics.*

Unit 1: Introduction to Flood:

Introduction; floods - causes of occurrence, flood classification - probable maximum flood, standard project flood.

Unit II: Flood Estimation Methods:

Design flood, flood estimation - methods of estimation; estimation of flood peak - Rational method, empirical methods, Unit hydrograph method;

Unit III: Statistics in Hydrology:

Statistics in hydrology, flood frequency methods - Log normal, Gumbel's extreme value, Log-Pearson type-III distribution; depth-area-duration analysis;

Unit IV: Flood Routing Methods:

flood forecasting, flood routing – channel routing, Muskingum method, reservoir routing, modified Pul' s method; flood control - history of flood control, structural and non-structural methods of flood control measures,

Unit V Flood Management:

storage and detention reservoirs, levees, channel improvement; Gulley erosion and its control; soil erosion and sediment control measures; river training works, planning of flood control projects and their economics.

TEXT BOOKS:

1. Dhruvanarayana, V. V. (1993). Soil and Water Conservation Research in India. ICAR, New Delhi.

2. Goldman, S. J, Jackson K. and Bursztynsky, T. A. (1986). Erosion and Sediment Control Handbook. McGraw Hill Book Company.

REFERENCES:

1. Suresh, R. (1997). *Soil and water Conservation Engineering.* Standard Publishers and Distributors.
2. USBR. (1978). *Design of Small Canal Structures.* U S Bureau of Reclamation.
3. USBR. (1987). *Design of Small Dams.* US Bureau of Reclamation.
4. Murthy, V.V.N. (1998). *Land and Water Management.* Kalyani Publishing, New Delhi.

III Year I - Semester	L	T		T	C
	3	1	-	4	4

AG313 Remote Sensing & GIS Applications

Course Description & Objectives:

To introduce the students with principles and basic concepts of Remote Sensing and GIS and its applications in data analysis and planning.

Course Outcomes:

At the end of the course, the students will understand:

1. *the remote sensing principles, satellite data processing and available data products.*
2. *the spatial data models, analysis and presentation techniques*
3. *application of Remote Sensing and GIS techniques in various fields of agriculture, soil, land and forest resources*
4. *decision making process and utilization of advanced techniques in addressing the real world problems.*

Unit 1: Introduction Remote Sensing:

Introduction, History of remote sensing, Physics of Radiant Energy – Electromagnetic spectrum and its nature, Interactions of electromagnetic radiation with different media, Atmospheric effects in remote sensing, Spectral Reflectance curves of vegetation, soil and water, Ideal and real remote sensing. Atmospheric windows, Active and Passive remote sensing;