Syllabus for B.Sc. (Hons) Agriculture Year – III (Sem. VI)

Subject Code: 16AS1602

Subject Short Name: Agron. 6.9

Subject Name: Dryland agriculture/ Rainfed agriculture and watershed management

Objective:

1. To learn about characteristics and conditions of dryland/rainfed agriculture
2. To gain knowledge about drought and its mitigation
3. To impart knowledge on water harvesting and watershed management

Credits Earned: 2 Credits (1+1)

Course Outcomes: After completion of this course, Students will be able to

- Understand the principles, challenges, and prospects of dryland and rainfed agriculture in India.
- Analyze soil and climatic conditions, drought impact, and water availability in rainfed regions.
- Evaluate soil and water conservation techniques, water harvesting methods, and watershed management.
- Learn crop adaptation strategies, contingent crop planning, and alternative land-use systems for dryland farming.
- Develop practical skills in rainfall analysis, soil moisture determination, drought assessment, and watershed characterization..

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Progressive Assessment (PA)	Viva (V)	Term work (TW)	
1	0	2	2	40	20	20	10	10	100

Theory Content:

Unit	Topics	Contact Hours
1	Dryland/Rainfed agriculture: Introduction, types and characteristics	**1**

2	History, Problems and prospects of dry land/rainfed agriculture in India	**1**
3	Soil and climatic conditions prevalent in dry land/rainfed areas	**1**
4	Length of Growing Period (LGP) and Soil Moisture Availability (SMA) and its impact on crop and cropping system	**1**
5	Soil and water conservation techniques;	**1**
6	Drought: types, effect of water deficit on physio- morphological characteristics of the plants; Crop adaptation and mitigation to drought	**1**
7	Water harvesting: importance, its techniques, Efficient utilization of water through soil and crop management practices	**1**
8	Crops, cropping systems and management of crops in dry land/rainfed areas	**1**
9	Contingent crop planning for aberrant weather conditions	**1**
10	Concept, history, objective, principles and components of watershed management, factors affecting watershed management	**1**
11	Long term rainfall analysis in relation to simple mathematical models and forecasting the weather abnormalities	**1**
12	Alternate land use system location; regional and crop specific dryland principles and practices for profitable and sustainable dryland farming and allied enterprises	**2**
	Total	**13**

Practical Content:

Unit	**Topics**	**Contact Hours**
1	Studies on climate classification, rainfall pattern in rainfed areas of the country and pattern of onset and withdrawal of monsoons	**2**

2	Calculation of Length of Growing Period (LGP) and Soil Moisture Availability (SMA) Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India	**2**
3	Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops.	**2**
4	Critical analysis of rainfall and possible drought period in the country.	**2**
5	Effective rainfall and its calculation	**2**
6	Studies on cultural practices for mitigating moisture stress including mechanical and agronomic measure	**2**
7	Soil moisture determination under different land situations, Importance of seed priming to mitigate drought	**2**
8	Assessment of meteorological drought	**2**
9	Characterization and delineation of model watershed	**2**
10	Seed treatment, viz., seed hardening and seed priming techniques for all the agricultural crops Field demonstration on soil and moisture conservation measures	**2**
11	Field demonstration on construction of water harvesting structures and visit to rainfed research station/watershed.	**2**
	Total	**22**

Reference Books:

- A.K. Srivastava and P.K. Tyagi. 2011. Practical Agricultural Meteorology. New Delhi Publishing Agency, New Delhi.
- D. Lenka. 2006. Climate, Weather and Crops in India. Kalyani Publishers, New Delhi.
- G.S.L.H.V. Prasad Rao. 2008. Agricultural Meteorology. Prentice Hall of India Pvt. Ltd., New Delhi.
- H.S. Mavi and Graeme J. Tupper. 2005. Agrometeorology – Principles and applications of climate studies in agriculture. International Book Publishing Co., Lucknow.

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
25%	25%	20%	10%	10%	10%

Instructional Method:

1. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board may also use any of tools such as demonstration, role play, quiz, brain storming, MOOCs etc.
2. The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms.
3. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory/ field.
4. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.