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

Subject Code: 16AS0613

Subject Short Name: Ag. Engg. 6.2

Subject Name: Renewable energy in Agriculture and Allied Sector

Objective:

1. To gain the knowledge on different types of materials used in Renewable Energy
2. To understand the importance of Renewable Energy technology and its applications
3. To train the students on the applications of solar thermal technology

Credits Earned: 2 Credits (1+1)

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

- Understand the various forms of renewable and non-renewable energy resources.
- Compare advantages and limitations of solar, wind and bioenergy systems.
- Learn the basics of the gadgets working on various types of renewable and clean energy technologies.
- Apply the various gadgets working on renewable energy for various agricultural sector applications.

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	1	3	40	20	20	10	10	100

Theory Content:

Unit	Topics	Contact Hours
1	Classification of energy sources, contribution of these sources in agricultural sector	**1**
2	Familiarization with biomass utilization for biofuel production and their application	**1**

3	Familiarization with types of biogas plants and gasifiers, biogas, bio alcohol, biodiesel and biooil production and their utilization as bioenergy resource	**4**
4	Introduction of solar energy, collection and their application	**1**
5	Familiarization with solar energy gadgets: solar cooker, solar water heater, application of solar energy: solar drying, solar pond, solar distillation, solar photovoltaic system and their application	**4**
6	Introduction of wind energy and their application	**2**
7	Availability of bio mass and their application in different places	**2**
	Total	**15**

Practical Content:

Unit	**Topics**	**Contact Hours**
1	Familiarization with renewable energy gadgets	**2**
2	To study biogas plant	**2**
3	To study gasifier	**2**
4	To study the production process of biodiesel	**2**
5	To study briquetting machine	**2**
6	To study the production process of bio-fuels	**2**
7	Familiarization with different solar energy gadgets	**2**
8	To study solar photovoltaic system: solar light, solar pumping, solar fencing	**2**
9	To study solar cooker, to study solar drying system	**2**
10	To study solar distillation and solar pond	**2**
11	Solar Wind hybrid system	**2**
12	Field visit to Solar –Wind farm	**2**
	Total	**24**

Reference Books:

- Fundamentals of Renewable Energy Sources, Fundamentals of Renewable Energy Sources, N. S. Rathore, Himanshu Publication, 2010
- Fundamentals of Renewable Energy Sources, Fundamentals of Renewable Energy Sources, G.N. Tiwari and M. K. Ghosal, Alpha Science International Ltd, 2007
- Energy Technology Nonconventional, Renewable and conventional, Energy Technology Nonconventional, Renewable and conventional, S. Rao, B. B. Parulekar, Visal Andhra Publishing House, 2005
- Non-Conventional Energy Sources, Non-Conventional Energy Sources, G. D. Raj, Khanna Publication, 2005

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 black 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 laboratory and class-room.
3. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
4. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.