

INSTITUTE	FACULTY OF AGRICULTURE
PROGRAM	BACHELOR OF SCIENCE (Hons.) AGRICULTURE
SEMESTER	4
COURSE TITLE	RENEWABLE ENERGY AND GREEN TECHNOLOGY
COURSE CODE	16AS0406
COURSE CREDITS	2

Objective:

- 1 To make students aware of renewable energy as a resource and various gadgets working on it.

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

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

Pre-requisite of course: Students will get the knowledge regarding the renewable energy and its application in agriculture.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
1	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	1 Classification of energy sources, contribution of these sources in agricultural sector	1
2	2 Familiarization with biomass utilization for biofuel production and their application	1
3	3 Familiarization with types of biogas plants and gasifiers, biogas, bioalcohol, biodiesel and biooil production and their utilization as bioenergy resource	4
4	4 Introduction of solar energy, collection and their application	1

Contents : Unit	Topics	Contact Hours
5	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	6 Introduction of wind energy and their application	2
7	7 Availability of bio mass and their application in different places	2
Total Hours		15

Suggested List of Experiments:

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

Textbook :

- 1 NA, NA, NA, NA

References:

- 1 Fundamentals of Renewable Energy Sources, Fundamentals of Renewable Energy Sources, N. S. Rathore, Himanshu Publication, 2010
- 2 Fundamentals of Renewable Energy Sources, Fundamentals of Renewable Energy Sources, G.N. Tiwari and M. K. Ghosal, Alpha Science International Ltd, 2007
- 3 Energy Technology Nonconventional, Renewable and conventional, Energy Technology Nonconventional, Renewable and conventional, S. Rao, B. B. Parulekar, Visalandhra Publishing House, 2005
- 4 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 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 / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
25.00	25.00	20.00	10.00	10.00	10.00

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.