

Academic Course Description

BHARATH UNIVERSITY
 Faculty of Engineering and Technology
 Department of Electrical and Electronics Engineering
BBA005 Energy Engineering And Management
Eighth Semester, (Even Semester)

Course (catalog) description

The purpose of this course to develop a strong foundation in energy engineering and conservation. This course introduces Energy management in engineering. This course also discussed concepts of engineering economics and energy generation Technology. Toenlight the student in the field of energy engineering concern with energy efficiency, energy service and facility management

Compulsory/Elective course: Elective for EEE students

Credit & Contact hours : 3 and 45 hours

Course Coordinator : Mrs.K.Venkateswari

Instructors : Mrs.K.Venkateswari

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Mrs.K.Venkateswari	Final year EEE	KS 304		kvenkateswari07@gmail.com	9.00-9.50 AM

Relationship to other courses:

Pre –requisites : Professional course

Assumed knowledge : Basic level knowledge in Energy Engineering, Renewable Energy sources and Energy generation Technology.

Syllabus Contents

UNIT I INTRODUCTION TO ENERGY AND ENVIRONMENT 9 HOURS

Definition – Fossil fuel reserves – Energy consumption – Greenhouse effect, global warming – Renewable energy resources – Environmental aspects, utilization – energy prizes – Energy policies.

UNIT II ENERGY CONSERVATION 9HOURS

Need – different types of energy conservation schemes – industrial energy use – energy surveying and auditing – energy index – cost of energy – cost index-energy conservation in engineering and process industry in thermal systems, in buildings and non-conventional energy resources schemes.

UNIT III ENERGY GENERATION BY TECHNOLOGY
9HOURS

Fuels and consumption – Boilers – Furnaces – Waste heat recovery systems – Heat pumps and refrigerators – Storage systems – Insulated pipe work systems – heat exchangers.

UNIT IV ENERGY MANAGEMENT
9HOURS

Energy management principles – energy resource management – energy management information systems – Instrumentation and measurement – Computerized energy management.

UNIT V ENGINEERING ECONOMICS
9HOURS

Costing techniques – Optimization cost – Optimal target investment schedules – Finance appraisal – Profitability – Project management.

TEXT BOOK(S) AND/OR REQUIRED MATERIALS
TOTAL=45 HOURS

T1.Amlan chakrabarti, “Energy Engineering and Management”, published by PHI learning pvt.ltd, 30 Jan 2011.

T2.K.V.Sharma, ”Energy management and Conservation”, published by K International publishing home, 03 Sep 2011.

REFERENCE BOOKS:

- R1. Comprehensive Renewable energy by editor in chief; Alisayiah.
- R2 .Encyclopedia of energy engineering and Technology by edited by Cutler J Cleveland.
- R3.Energy Efficiency and renewable Energy by Frank kreith; D.yogigoswami.
- R4.Energy Management Hand book, eighth edition by stave Doty Wayne. C Turner.
- R5.Engineering economics by R.PanneerSelvam, PHI publication.

Computer usage:

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	0%
Non major elective	-	100%

Broad area:Renewable Energy/Energy conservation/Energy Management/Economics/Energy Generation

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1 st week	Session 1 to 14	2 Periods
2	Cycle Test-2	September 2 nd week	Session 15 to 28	2 Periods
3	Model Test	October 2 nd week	Session 1 to 45	3 Hrs.
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To enlight the student in the field of energy engineering concern with energy efficiency, energy service and facility management. This course to develop a strong foundation in energy engineering and conservation. This course introduces Energy management in engineering.	Correlates to program outcome		
	H	M	L
1. Understanding the different energy resources and their uses	b	f,g,l	
2. Understanding the different energy conservation techniques	a	h,k	
3. Understanding the impact of energy on environment	d	h	
4. Understanding the energy Management	g,i	c,l	
5. Understanding the Engineering Economics	k	b,e	

H: High Correlation, M: Medium Correlation, L: Low Correlation

Draft Lecture Schedule

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I			
1.	Definition	No	[T1],[T2] [R1]
2.	Fossil fuel reserves	No	
3.	Energy consumption	No	
4.	Greenhouse effect, global warming	No	
5.	Renewable energy resources	No	
6.	Environmental aspects, utilization	No	
7.	energy prizes	No	
8.	Energy policies	No	
9.	Energy policies	No	
UNIT II			
10.	different types of energy conservation schemes	No	[T1],[T2] [R2]
11.	industrial energy use	No	
12.	energy surveying and auditing	Yes	
13.	energy index	Yes	
14.	cost of energy	Yes	
15.	cost index-energy conservation in engineering and process industry in thermal systems	Yes	
16.	cost index-energy conservation in engineering and process industry in thermal systems	Yes	
17.	buildings and non-conventional energy resources	No	

18.	buildings and non-conventional energy resources	No	
UNIT III			
19.	Fuels and consumption	No	[T2]
20.	Boilers ,Furnaces	No	
21.	Waste heat recovery systems	No	
22.	Heat pumps and refrigerators	No	
23.	Storage systems	No	
24.	Insulated pipe work systems	No	
25.	Insulated pipe work systems	No	
26.	heat exchangers	No	
27.	heat exchangers	No	
UNIT IV			
28.	Energy management principles	No	
29.	energy resource management	No	
30.	energy resource management	No	
31.	energy management information systems	No	
32.	energy management information systems	No	
33.	Instrumentation and measurement	No	
34.	Instrumentation and measurement	No	
35.	Computerized energy management	No	
36.	Computerized energy management	No	
UNIT V			
37.	Costing techniques	Yes	
38.	Optimization cost	Yes	
39.	Optimal target investment schedules	Yes	
40.	Finance appraisal	Yes	
41.	Finance appraisal	Yes	
42.	Profitability	Yes	
43.	Profitability	Yes	
44.	Project management	No	
45.	Project management	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by:

Mrs.K.Venkateswari

Dated :

Addendum

ABET Outcomes expected of graduates of B.Tech / EEE / program by the time that they graduate:

- a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) An ability to identify, formulate, and solve engineering problems.
- c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) An ability to design and conduct experiments, as well as to analyze and interpret data.
- e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) An ability to apply reasoning informed by the knowledge of contemporary issues.
- g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) An ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) An ability to function on multidisciplinary teams.
- j) An ability to communicate effectively with the engineering community and with society at large.
- k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) An ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION

Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE

Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM

Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

Course Teacher	Signature
Mrs.K.Venkateswari.	

Course Coordinator
(Mrs.K.Venkateswari)

HOD/EEE
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