Syllabus

MET 234 Principles of Renewable energy

General Information

Date
September 21st, 2017

Author
Unknown Author

Department
Science and Technology

Course Prefix
MET

Course Number
234

Course Title
Principles of Renewable energy

Course Information

Credit Hours
3

Lecture Contact Hours
1

Lab Contact Hours
4

Other Contact Hours
0

Catalog Description
This course will explore and discuss the principals of renewable energy on various scales, including the regional and global context, with an eye towards the developed and developing nations. The student will study how different renewable power can be utilized in a wide variety of settings and limitations imposed. This course is intended for second year students in Mechanical Technology, Instrumentation & Controls Technology and Engineering Science. With the growing application of renewable energy, students interested in this business sector will have a solid foundation in renewable energy. Field trips to wind turbine, solar panel and geothermal installations will be conducted when viable.

Key Assessment
This course does not contain a Key Assessment for any programs

Prerequisites
None

Co-requisites
None

Grading Scheme
Letter

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category
None

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Inquiry   Perseverance

Course Learning Outcomes

Course Learning Outcomes

1. Describe the technology of each of the sources of renewable energy

2. Describe economic issues around renewable energy sources

3. Performing an analysis to evaluate, compare and select energy systems based on economic and environmental considerations

Program Affiliation

This course is not required as a core course in a program

Outline of Topics Covered

I Introduction And The Relationship Between Energy And Society

II Methods Of Analysis For Renewable Energy (RE) Technologies

III Renewables: Cost And Performance

IV Energy Policy

V Overview Of RE Systems

a) Energy Mathematics And Basics For Each Type Of Renewable Energy

b) Economics And Environmental Factors Of Each Type Of Energy

c) Energy Efficiency And Design Relative To

d) Passive Solar

VI Solar Utilization In Buildings

a) Design Related Efficiency

b) System Elements

c) Functional Systems

d) Passive Solar Mathematics

VII Solar Thermal Systems

a) Design Efficiency (Energy Chain & Losses)

b) System Elements

c) Applications

d) Solar Thermal Mathematics

e) Economic Factors

f) Environmental Factors

VIII Photovoltaic Systems

a) Photovoltaic System Design

b) Design Related Efficiency

c) System Elements

d) Grid Tied Systems –Off Grid Systems

e) Photovoltaic Systems Mathematics

f) Economic Factors

g) Environmental Factors

IX Wind Energy

a) Wind Turbine Design

b) Design Related Efficiency

c) System Elements

d) Power Control

e) Wind Parks (Farms)

f) Off-Grid Applications

g) Wind Power Mathematics

h) Economic Factors

X Biomass Energy

a) Feedstock

b) Conversion To Gaseous Fuels

c) Conversion To Liquid Fuels

d) Conversion To Electricity

e) Economic Assessment

XI Geothermal Energy

a) Design

b) Related Efficiency

c) System Elements

d) Economics Assessment

XII Hydroelectricity

a) Historical Perspective

b) Environmental Impact Concerns

c) Future potentials

XII(Marine-Based And Emerging Technologies

a) Wave And Tidal Power

b) What New Research Shows Promise