HOLYOKE COMMUNITY COLLEGE
Format for NEW Course Proposals

In preparing a new course proposal, please fill out this form completely, including all categories.

Date: 3/23/2010

Course No. (coordinated with Registrar) SUS 104

Course Title Introduction to Solar Energy

Transfer Compact Code, if any (A, B, C, D) D

No. of Credits: 4 Contact Hours: Lecture Hours: 3 Lab Hours: 3

Clinical Hours: Other Hours: Studio Hours

Course Description as it would appear in catalog:

This course provides a comprehensive training in the application of solar technology. Students will gain an understanding of the solar energy resource and it's adaptive application in a variety of strategies including passive solar, active solar thermal and photovoltaics. In addition, students will practice designing systems on site for a given location and explore the potential of a solar-based economy. The laboratory will train students to conduct solar energy site assessments, install solar thermal systems and promote the use of solar energy in residential, commercial and municipal facilities.

Prerequisites: SUS 102 & SUS 103

STATEMENT OF PURPOSE, including, if possible, the place and function of the course in the total college curriculum and/or specific areas of study, the relation, if any, to other courses in the same or closely allied fields or disciplines, suggested students for whom the course might be particularly useful, and any other information that might be helpful to those reviewing the proposal and to future instructors of this course.

This course will be a suggested elective for students in one of the three Sustainability Studies Options. It will also be a required course for the newly developed Solar Energy Certificate Program. The course should appeal to students interested in sustainability studies, and business and engineering fields, as well as students in the market for "green jobs".

Objectives for the course: May include student-learning outcomes here.

Upon successful completion of this course students should be able to:
1. Understand, describe and quantify the annual solar resource at a particular site;
2. differentiate between passive thermal, active thermal and photovoltaic and the applications of each;
3. conduct a solar energy site visit and use the "solar pathfinder";
4. describe the principles, benefits and limitations of passive solar thermal design and devices;
5. illustrate heat gain and thermal flows with various techniques;
6. properly site and orient a building to optimize solar gain;
7. describe the proper selection and placement of windows for passive solar design;
8. understand the benefits of daylighting and describe methods for implementing daylighting techniques;
9. describe the principles, benefits and limitations of active solar thermal systems;
10. calculate the heat output and cost savings of active solar thermal systems;
11. describe the principles, benefits and limitations of photovoltaic energy systems;
12. explain how photovoltaic cells produce electricity;
13. identify various types of PV cells and describe how they are produced;
14. provide a rough estimate of installation costs and payback for a PV system;
15. describe various building integrated PV techniques;
16. be able to install a solar thermal system.

Special problems likely to be encountered in teaching this course.

Specialized equipment will be needed for this course but will be available through our collaboration with Nuestras Raices.

Typical methods of testing and evaluation of students in such a course.

Lecture, discussion, research papers, quizzes, exams, individual and small group projects

AUTHOR AND TITLE OF TEXTBOOKS and other instructional materials, including library acquisitions suggested for this course.

1. Solar Revolution: The Economic Transformation of the Global Energy Industry, by Travis Bradford. MIT Press, 2006.
2. Solar Energy: Renewable Energy and the Environment, by Robert Foster, Majid Ghassemi and Alma Cota. CRC Press, 2009.

Basic outline of course content, indicating major and minor emphases.

Major	Minor
1. Basic energy concepts, terms and units 2. Characteristics of sunlight 3. Using the Solar Pathfinder 4. Basic thermodynamics concepts 5. History and principles of passive solar design 6. Calculating solar heat gain 7. Daylighting techniques 8. History and principles of active solar design 9. Types of active solar thermal systems 10. History and principles of photovoltaic systems 11. Types of PV cells and systems 12. Building integrated techniques 13. Economics of solar systems Laboratory outline: 1. The Solar Pathfinder/ solar access 2. Building construction and safety issues using the "roof, wall, window, door" kit 3. Ventilation and building envelopes 4. Passive solar landscaping, overhangs, awnings 5. Solar ovens 6. Conducting a solar thermal site visit 7. Solar hot water demo system 8. Pipe cutting, fitting and soldering with kit 9. Conducting a PV site visit 10. PV production techniques	All topics have equal emphasis.

Name of author or co-authors of the proposal.

Kate Maiolatesi

Describe additional resources required:

Faculty and other personnel (full-time/part-time):	Adjunct faculty needed
Facilities (dedicated and/or shared:	classroom and laboratory space needed.
Equipment (non-computer):	All specialized equipment will be available through collaboration with Nuestras Raices.
Other resources required:	none
Computer hardware, software, support including AV and Multimedia	none

Date:

CIO Signature

I have reviewed the course proposal and have requested transfer eligibility from area colleges.

Date:

Director of Transfer Affairs:

Date:

Registrar

Semester and year New Course will be implemented:

Signature of Dean of Originating Division - signifying approval by the Division.

Vote: Date: Signature Field

Signature of Dean(s) of Other Divisions, whose students would be directly affected by the proposal, signifying the concurrence of their division, (Indicate n/a if this does not apply.)

Vote: Date: Signature Field

Signature of Curriculum Committee Chair - signifying approval of the Committee.

Vote: Date: Signature Field

Signature of Senate President - signifying approval of the Senate.

Vote: Date: Signature Field