**New York City College of Technology**

**Interdisciplinary Committee**

**Course Review Form**

**DATE:** 9/28/2014

**REVIEWER:** Sean P. MacDonald

**COURSE TITLE & NUMBER:** CMCE 2510 Sustainable Energy

**CREDIT HOURS:** 3

**PREREQUISITES:** Eng 1101, Math 1275

**COURSE IS:** Existing X New In development

**PROPOSED COURSE DESIGNATION**: X College Option X elective Capstone other:

**DEPARTMENT HOUSED IN:** CMCE

**PROPOSED STRUCTURE (e.g., co-taught, guest lecture, LC, other):**  co-taught; guest lecturers (20%); shared credits (1.5 hrs)

**CREDIT DISTRIBUTION** (if co-taught): 1.5 hrs.

**CATALOG DESCRIPTION:**  This special topics interdisciplinary course provides an introduction to sustainable energy systems, such as hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students will explore economic, social, political, and environmental impacts caused by the demand for sustainable resources.

**DESCRIBE & EVALUATE HOW COURSE MEETS INTERDISCIPLINARY CRITERIA?**

**<Consider:** Students in the course will not only learn about the science and engineering aspects of the natural gas, but will also be exposed to a range of perspectives on the topic, including the environmental, political, economic and ethical impacts*.* Students will be required to address the varied perspectives on the natural gas controversy. As stated on the course outline, the course will require students to synthesize and transfer knowledge across disciplines by applying their scientific knowledge to solve energy conversion calculations and applying their writing skills to reflect on the related topics; will be required to recognize diverse perspectives, drawing upon the perspectives of both Chemistry and CMCE, as well as those of public policy and economics. Students will be required to connect and integrate across discipline knowledge and skills through exposure to the perspectives of other disciplines and by incorporating these into group assignments, collaborative group work focused on debate questions surrounding the natural gas controversy and through the assumption of the roles of different disciplines in the actual debates. This will directly involve students in applying diverse perspectives and challenge them to think critically about the issues. This new course is unique and does not appear to be similar to any other current course offering.

**DESCRIBE & EVALUATE THE INTERDISCIPLINARY STRUCTURE?**

The course will combine both co-teaching (from two different departments – CMCE and Chemistry) and guest lecturers; guest lecturers will comprise 20% of course; The course has a clearly defined theme**: *Sustainable energy systems are the future of energy in the world****;* a central problem/question: ***In the United States, natural gas appears to be the answer. The growth of the natural gas industry has many benefits for the country; however, technologies required to accelerate the growth of the industry include hydraulic fracturing which has environmental impacts which have not been completely identified.***

Interdisciplinary methods that will be evoked and applied: ***This course will integrate science and engineering with perspectives from economics and politics.*** Thus, the course will draw upon the perspectives of several disciplines, including economics and public policy.

The structure for teaching the course is clearly interdisciplinary, combining co-teaching across two departments as well as guest lecturers who would offer the perspectives of other disciplines in addressing the economic, political and policy issues relating to sustainable energy.

**DOES COURSE MEET REQUIREMENTS FOR GENERAL EDUCATION? Yes;** students will learn from a range of views and perspectives; assignments designed to have students work collaboratively in groups to prepare for presentations and debates; the class presentations will challenge students to develop effective communication skills; students will further be challenged to think critically in this course as they work on problem solving tasks; students’ exposure to the perspectives of several disciplines in the course will require them to synthesize and transfer knowledge across disciplines.

The course meets the requirements for a natural science requirement for the Associate degree in Chemical Technology; course will be listed in the Chemistry Department, and offered as an elective and as a College Option requirement.

< see links for criteria CityTech: <http://www.300jaystreet.com/college-council/curriculum_proposals/past_proposals> NYS: <http://www.highered.nysed.gov/ocue/lrp/liberalarts.htm> >

**STRENGTHS:** The course would address a very timely and important topic: sustainable energy and would incorporate varied disciplinary perspectives on the issue of natural gas as the nation’s most viable path to a sustainable energy source. It will also actively engage students and challenge them to apply the methodologies and perspectives of several disciplines. As stated in the course outline, “Students will learn about the scientific process of energy production and its applications. Students will explore economic, social, political and environmental impacts caused by the demand for sustainable resources.”

The description of the final presentation and class debate with students assuming the roles of different groups in society is a very creative way to get students to actively give life to the often conflicting interests of different stakeholders in the clean energy debate.

**WEAKNESSES:** None. One suggestion for clarification: The syllabus covers various forms of renewable energy - water, solar, wind and geothermal; how will the discussion/evaluation of these alternative energy sources be tied to the central question the course will address that ‘natural gas appears to be the answer,?