New York City College of Technology, CUNY

CURRICULUM MODIFICATION PROPOSAL FORM

This form is used for all curriculum modification proposals. See the [Proposal Classification Chart](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Proposal_Classification_Chart.pdf) for information about what types of modifications are major or minor. Completed proposals should be emailed to the Curriculum Committee chair.

|  |  |
| --- | --- |
| **Title of Proposal** | Energy Resources |
| **Date** | September 30, 2014 |
| **Major or Minor** | Major |
| **Proposer’s Name** | Melanie Villatoro  Diana Samaroo |
| **Department** | Chemistry |
| **Date of Departmental Meeting in which proposal was approved** | September 22, 2014 |
| **Department Chair Name** | Anthony Cioffi (CMCE); Peter Spellane (Chemistry) |
| **Department Chair Signature and Date** | **AC Signiture 9/30/14** |
| **Academic Dean Name** | Kevin Hom; Karl Botchway |
| **Academic Dean Signature and Date** | **DHom9/30/14**  **4/7/15** |
| **Brief Description of Proposal**  (Describe the modifications contained within this proposal in a succinct summary. More detailed content will be provided in the proposal body. | A new course is proposed. This course is interdisciplinary and focuses on the economic, social, political, and environmental impacts of various energy resources. The course fulfills the requirements for the interdisciplinary elective required for baccalaureate students as part of the College General Education Common Core Standards. |
| **Brief Rationale for Proposal**  (Provide a concise summary of why this proposed change is important to the department. More detailed content will be provided in the proposal body). | Starting in Fall 2013, CUNY implemented the Pathways initiative across its undergraduate colleges. The Pathways Common Core is the General Education requirement in all CUNY colleges. All baccalaureate students are required to complete one interdisciplinary liberal arts and sciences course. This course provides a topic of interest to multiple disciplines including but not limited to engineering technology, engineering sciences, and environmental science. Students will work across disciplines, learn to recognize varied perspectives, think critically, communicate effectively, and work collaboratively. |
| **Proposal History**  (Please provide history of this proposal: is this a resubmission? An updated version? This may most easily be expressed as a list). | This is an updated version of the original proposal (CMCE 2510), moved from CMCE to CHEM department. |

**ALL PROPOSAL CHECK LIST**

|  |  |
| --- | --- |
| Completed CURRICULUM MODIFICATION FORM including: |  |
| * Brief description of proposal | ✓ |
| * Rationale for proposal | ✓ |
| * Date of department meeting approving the modification | ✓ |
| * Chair’s Signature | ✓ |
| * Dean’s Signature | ✓ |
| Evidence of consultation with affected departments  List of the programs that use this course as required or elective, and courses that use this as a prerequisite. | N/A |
| Documentation of Advisory Commission views (if applicable). | N/A |
| Completed [Chancellor’s Report Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-09-Chancellor_Report_Quick_Reference_Guide1.doc). | ✓ |

**EXISTING PROGRAM MODIFICATION PROPOSALS**

|  |  |
| --- | --- |
| Documentation indicating core curriculum requirements have been met for new programs/options or program changes. | n/a |
| Detailed rationale for each modification (this includes minor modifications) | n/a |

New York City College of Technology, CUNY

NEW COURSE PROPOSAL FORM

This form is used for all new course proposals. Attach this to the [Curriculum Modification Proposal Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/2013-10-10-Curriculum_Modification_Proposal_Form.docx) and submit as one package as per instructions. Use one New Course Proposal Form for each new course.

|  |  |
| --- | --- |
| **Course Title** | Energy Resources |
| **Proposal Date** | September 30, 2014 |
| **Proposer’s Name** | Melanie Villatoro  Diana Samaroo |
| **Course Number** | ESCI 2000 |
| **Course Credits, Hours** | 3 credits, 3 hours |
| **Course Pre / Co-Requisites** | ENG 1101, MATH 1275 or higher |
| **Catalog Course Description** | This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | Starting in Fall 2013, CUNY implemented the Pathways initiative across its undergraduate colleges. The Pathways Common Core is the General Education requirement in all CUNY colleges. All baccalaureate students are required to complete one interdisciplinary liberal arts and sciences course. This course provides a topic of interest to multiple disciplines including but not limited to engineering technology, engineering sciences, and environmental science. Students will work across disciplines, learn to recognize varied perspectives, think critically, communicate effectively, and work collaboratively. |
| **Intent to Submit as Common Core**  If this course is intended to fulfill one of the requirements in the common core, then indicate which area. | Yes, Scientific World |
| **Intent to Submit as An Interdisciplinary Course** | YES |
| **Intent to Submit as a Writing Intensive Course** | YES |

**NEW COURSE PROPOSAL CHECK LIST**

Use this checklist to ensure that all required documentation has been included. You may wish to use this checklist as a table of contents within the new course proposal.

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | ✓ |
| * Brief Rationale | ✓ |
| Completed [Library Resources and Information Literacy Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form.doc) | ✓ |
| **Course Outline**  Include within the outline the following. |  |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | ✓ |
| Prerequisites/Co- requisites | ✓ |
| Detailed Course Description | ✓ |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | ✓ |
| Example Weekly Course outline | ✓ |
| Grade Policy and Procedure | ✓ |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | ✓ |
| Library resources and bibliography | ✓  See course outline |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. | ✓ |
| Target Students who will take this course. Which programs or departments, and how many anticipated?  Documentation of student views (if applicable, e.g. non-required elective). | ✓ |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. | ✓ |
| If additional physical resources are required (new space, modifications, equipment), description of these requirements. If applicable, Memo or email from the VP for Finance and Administration with written comments regarding additional and/or new facilities, renovations or construction. | ✓ |
| Where does this course overlap with other courses, both within and outside of the department? | ✓ |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? | ✓ |
| If needs assessment states that this course is required by an accrediting body, then provide documentation indicating that need. | N/A |
| **Course Design**  Describe how this course is designed. |  |
| Course Context (e.g. required, elective, capstone) | elective |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | lecture |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | See course outline |
| How does this course support Programmatic Learning Outcomes? | See course outline |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | No |
| **Additional Forms for Specific Course Categories** |  |
| [Interdisciplinary Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/Application-for-Interdisciplinary-Course-Designation.docx) (if applicable) | ✓ |
| [Common Core (Liberal Arts) Intent to Submit](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/CommonCoreCourseSubmissionForm_4.2.12.doc) (if applicable) | ✓ |
| Writing Intensive Form if course is intended to be a WIC (under development) | ✓ |
| If course originated as an experimental course, then results of evaluation plan as developed with director of assessment. | No |
| **(Additional materials for** [**Curricular Experiments**](http://www.300jaystreet.com/college-council/curriculum_proposals/curricular-experiments)**)** |  |
| Plan and process for evaluation developed in consultation with the director of assessment. (Contact Director of Assessment for more information). | No |
| Established Timeline for Curricular Experiment | No |

New York City College of Technology

Construction Management and Civil Engineering Technology Department

Chemistry Department

## COURSE CODE: ESCI 2000

## TITLE: Energy Resources

## Number of class hours, lab hours if applicable, credits: 3 lecture hours, 3 credits

COURSE DESCRIPTION:

This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts.

COURSE CO/PREREQUISITE (S):

ENG1101, MATH 1275 or higher

RECOMMENDED/TYPICAL/REQUIRED TEXTBOOK (S) and/or MATERIALS\*

*Presidential Documents Executive Order 13514 of October 5, 2009*

*Building an Energy Sustainable Corps,* October 2012

*Hydropower Resource Assessment at Non-Powered USACE Sites,* July 2013

*Solar energy innovation and Silicon Valley*. Bulletin Of The Atomic Scientists 70, no. 5: 45-53

*A review of Safety, Health and Environmental (SHE) issues of solar energy system*. Renewable & Sustainable Energy Reviews 41, 1190-1204.*Chapter 2.01- Wind Energy – Introduction* in Comprehensive Renewable Energy, 2012

*Alaska: Gas Project Could Ensure Energy/Economic Future* in Pipeline & Gas Journal, 2014

*Energy, Environment, and Sustainable Development* in Renewable and Sustainable Energy Reviews, 2008

*Natural Gas* *and U.S. Economic Activity* in The Energy Journal, 2014

*Implications of U.S. Natural Gas Growth: Will Gas Bills be Cheaper?* in Pipeline & Gas Journal, 2013

*U.S. Liquefied Natural Gas Exports and America’s Foreign Policy Interests* in American Foreign Policy Interests, 2012

*International law and Renewable Energy: Facilitating Sustainable Energy For All?* in Melbourne Journal of International Law, Vol 14

*Chapter 13- Wind Energy Systems* in Solar Energy Engineering ( 2nd Edition), 2014

SAMPLE SEQUENCE OF TOPICS AND TIME ALLOCATIONS\*

|  |  |  |
| --- | --- | --- |
| Week | Topic | Reading Assignment |
| 1 | Introduction to Energy Resources | *Presidential Documents Executive Order 13514 of October 5, 2009*  *Building an Energy Sustainable Corps,* October 2012 |
| 2 | Water Power Energy | *Hydropower Resource Assessment at Non-Powered USACE Sites,* July 2013 |
| 3 | Solar Energy  Quiz 1 | *Solar energy innovation and Silicon Valley*.Bulletin Of The Atomic Scientists 70, no. 5: 45-53  *A review of Safety, Health and Environmental (SHE) issues of solar energy system*. Renewable & Sustainable Energy Reviews 41, 1190-1204. |
| 4 | Wind and Geothermal Energy  Quiz 2 | *Chapter 2.01- Wind Energy – Introduction* in Comprehensive Renewable Energy, 2012  *Chapter 13- Wind Energy Systems* in Solar Energy Engineering ( 2nd Edition), 2014 |
| 5 | Sustainable Architecture: Site Visit to Brooklyn Navy Yard | Field Trip |
| 6 | Introduction to Natural Gas | *The Gas Surge* in Science 2014 |
| 7 | Hydraulic Fracturing; GasLand, a film by Josh Fox |  |
| 8 | Case Study: Alaska Liquid Natural Gas Project | *Alaska: Gas Project Could Ensure Energy/Economic Future* in Pipeline & Gas Journal, 2014 |
| 9 | Environmental Impacts | *Energy, Environment, and Sustainable Development* in Renewable and Sustainable Energy Reviews, 2008 |
| 10 | Groundwater Modeling using HEC-RAS |  |
| 11 | Economic Impacts  Quiz 3 | *Natural Gas and U.S. Economic Activity* in The Energy Journal, 2014  *Implications of U.S. Natural Gas Growth: Will Gas Bills be Cheaper?* in Pipeline & Gas Journal, 2013 |
| 12 | Political Impacts  Quiz 4 | *U.S. Liquefied Natural Gas Exports and America’s Foreign Policy Interests* in American Foreign Policy Interests, 2012 |
| 13 | Foreign and Domestic Policy  Quiz 5 | *International law and Renewable Energy: Facilitating Sustainable Energy For All?* in Melbourne Journal of International Law, Vol 14 |
| 14 | Class Presentation | Research Papers Due |
| 15 | Class Debate |  |

### COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS

|  |  |
| --- | --- |
| **LEARNING OUTCOMES** | ASSESSMENT METHODS |
| Purposefully connect and integrate across-discipline knowledge and skills to solve problems. | This will be measured through their case study and in-class debate. |
| Synthesize and transfer knowledge across disciplinary boundaries by applying their scientific knowledge to solve energy conversion calculations and applying their writing skills to reflect on the related topics; | This will be measured in classwork, i.e. quizzes, exams, and class discussions. |
| Apply integrative thinking to problem-solving in ethically and socially responsible ways through their case study; | This will be measured through completion of their software modeling. |
| Recognize varied perspectives by examining the different viewpoints of all parties involved in the ongoing controversy regarding “fracking”; | This will be measured through the in-class debate and final oral presentations. |
| Think critically, communicate effectively, and work collaboratively through preparation of the final presentations and debate arguments. | This will be measured through the in-class debate and final oral presentations. Students will be graded based on Individual projects and Collaborative projects. Students will present in class, participate in class discussions (including group presentations and in-class group activities). |
| Become flexible thinkers | This will be measure through their debate arguments. |
| Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions. | This will be measured in classwork, i.e. quizzes, exams, and class discussions. |
| Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, particularly ethical responsibilities. | This will be measured through the midterm paper. |
| Understand the scientific principles underlying matters of policy or public concern in which science plays a role. | This will be measured through the case study assignment. |

### GENERAL EDUCATION LEARNING OUTCOMES/ASSESSMENT METHODS

|  |  |
| --- | --- |
| **LEARNING OUTCOMES** | ASSESSMENT METHODS |
| Develop knowledge from a range of disciplinary perspectives, and develop the ability to deepen and continue learning. Students will acquire tolls for lifelong learning. | This will be measured through the case study assignment. |
| Acquire and use the tools needed for communication, inquiry, analysis, and productive work. Students will communicate in diverse settings and groups. Understand and employ both qualitative and quantitative analysis to describe and solve problems, both independently and cooperatively. | This will be measured through the written midterm paper, final oral presentation, and final team debate.  This will be measured through completion of their software modeling. |
| Work productively within and across disciplines. | This will be measured in their group participation and submittals. |
| Gather, Interpret, evaluate, and apply information discerningly from a variety of sources and points of view. | This will be measured in their conclusions of the case study. |
| Evaluate evidence and arguments critically or analytically. | This will be measured through the midterm paper. |
| Produce well-reasoned written or oral arguments using evidence to support conclusions. | This will be measured through the midterm paper and case study. |
| Understand and apply values, ethics, and diverse perspectives in personal, professional, civic, and cultural/global domains. Applying knowledge and analyzing social, political, economic and historical issues. | This will be measured through the in-class debate and final oral presentations. |

SCOPE OF ASSIGNMENTS and other course requirements

Class Participation – The course will include a significant amount of discussion; each student is required to be an active participant in the class.

Quizzes – Quizzes will be given at the beginning of each class period to assess the student’s understanding of the reading assignment. Missed Quizzes cannot be made up. Quizzes are at the start of class; be on-time.

Midterm Paper - Students will be required to write a midterm paper discussing the validity of the documentary film, Gas Land.

Case Study – The course will perform a case study on the Alaska Natural Gas Project. Each student will be assigned an aspect of the project to summarize in written paper.

Final Paper/Class Debate – The class will be split into six groups: residents, economists, politicians, scientists, environmentalists, and businessmen. Each group will prepare a summative paper defending their opinion on the growth of the natural gas industry and participate in an in-class debate.

METHOD OF GRADING – elements and weight of factors determining the students’ grade

|  |  |
| --- | --- |
| Class Participation | 10% |
| Quizzes (5) | 20% |
| Midterm Paper | 15% |
| Case Study (1) | 15% |
| Final Paper | 15% |
| Class Debate | 25% |

ACADEMIC INTEGRITY POLICY STATEMENT

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

COLLEGE POLICY ON ABSENCE/LATENESS

A student may be absent without penalty for 10% of the number of scheduled class meetings during the semester as follows:

**Class Meets Allowable Absence**

1 time/week 2 classes

2 times/week 3 classes

3 times/week 4 classes

## Attached course outline written by: M.Villatoro and D. Samaroo

## Date: September 21, 2014

## Reviewed/Revised by: CMCE/Chemistry Department

## Date: March 30, 2015

**Course Needs Assessment**

**Target students and projected head counts:** Starting in Fall 2013, CUNY implemented the Pathways initiative across its undergraduate colleges. The Pathways Common Core is the General Education requirement in all CUNY colleges. All baccalaureate students are required to complete one interdisciplinary liberal arts and sciences course. This course provides a topic of interest to multiple disciplines including but not limited to engineering technology, engineering sciences, and environmental science. Students will work across disciplines, learn to recognize varied perspectives, think critically, communicate effectively, and work collaboratively. We anticipate that there will be 24 students enrolled in the course upon initial offering.

**Physical resources:** No additional physical resources are necessary.

**Overlap with other courses:** There is no overlap with other courses

**Full time faculty:** The course will be team taught and will include guest speakers.

**Course Design**

This course will be designed as follows and uses the following pedagogical strategies:

1. Discussions and lectures.
2. Readings, multimedia, and films (instructors will assign and screen the texts and media listed on the course outline, but they may also choose to provide students with additional texts for both in and out of class reading/screening).
3. Field trips (One field trip is schedule to the Brooklyn Navy Yard and must be done during the daytime hours, field trips may occur as a class activity scheduled during a class meeting if daytime or as individual or small group site visits scheduled individually by the students themselves.
4. Software Application (HEC-RAS software will be used for groundwater modeling).
5. OpenLab site will be maintained for the course to allow for sharing of information between faculty and students.
6. Writing assignments (this includes in-class and out-of-class writing assignments).

ID Course Survey for CMCE Students

Please take a few moments to answer the following questions. This survey is for informational purposes only. Participation is completely voluntary and anonymous.

All students enrolled in the BTECH are required to take one Interdisciplinary liberal arts and sciences course.

Have you completed this survey already? Yes\_\_\_\_\_\_\_\_\_\_\_ No\_\_\_\_\_\_\_\_\_\_

Are you enrolled in the BTech Program? Yes\_\_\_\_\_\_\_\_\_\_\_ No\_\_\_\_\_\_\_\_\_\_

Would you consider enrolling in the following class to fulfill your Interdisciplinary requirement?

**CMCE 2510 Sustainable Energy 3 cl hrs, 3 cr**

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.

***Prerequisites: ENG1101, MATH 1275***

Yes\_\_\_\_\_\_\_\_\_\_\_ No\_\_\_\_\_\_\_\_\_\_

For your reference, the current options for interdisciplinary courses are as follows:

**AFR 3000 Black New York 3 cl hrs, 3 cr**

Using history, literature, the arts, politics, and sociology, this interdisciplinary course seeks to trace the Africana presence in New York from the 1600s to the present. This localized course will enable students to examine the varied ways in which people of African descent in the Diaspora have helped to shape the complex identity of New York City over time. Readings, films, music, information literacy sources, and local cultural and research institutions will be used to examine topics, such as slavery, resistance, migration, immigration, labor, Civil Rights, popular culture, gender politics, and gentrification.

***Prerequisite: ENG 1101 and any AFRCourse***

**ECON 2505 Environmental Economics 3 cl hrs, 3 cr**

This course examines current environmental issues from a macroeconomic perspective, focusing on both the long- and short-term economic viability of various proposals to address current environmental challenges. Traditional goals of economic efficiency are examined in the context of the need to expand renewable energy sources, green design, sustainable construction and resource allocation and other efforts to combat climate change on a global scale.

***Prerequisite: ECON 1101 or ECON 1401***

**SBS 2000 Research Methods for the Social and Behavioral Sciences 3 cl hrs, 3 cr**

An introduction to the research methodologies utilized in the social and behavioral sciences, beginning with the fundamentals of research design, through data collection, analysis, interpretation, and the final reporting of results. Both quantitative and qualitative designs are examined using software to aid in inquiry and analysis.

***Prerequisite: Any introductory ANTH, ECON, GEOG, GOV, HIS, PSY***

Thank you for your participation!

**Chancellor’s Report Form**

**Section AIV: New Courses**

|  |  |
| --- | --- |
| **CUNYfirst Course ID** |  |
| **Department(s)** | **Chemistry** |
| **Career** | **[ x ] Undergraduate  [ ] Graduate** |
| **Academic Level** | **[ x  ] Regular  [   ] Compensatory  [   ] Developmental  [   ] Remedial** |
| **Subject Area** | **Interdisciplinary Course** |
| **Course Prefix** | **ESCI** |
| **Course Number** | 2000 |
| **Course Title** | Energy Resources |
| **Catalog**  **Description** | This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts. |
| **Pre/ Co Requisites** | **Prerequisites:** ENG 1101, MATH 1275 or higher |
| **Credits** | 3Credits |
| **Contact Hours** | 3 Class Hours, 0 Lab Hours |
| **Liberal Arts** | **[x ] Yes  [   ] No** |
| **Course Attribute (e.g. Writing Intensive, Honors, etc)** | **Writing Intensive** |
| **Course Applicability** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **[ ] Major** |  |  |  | | | **[ ] Gen Ed Required** | | **[ x ] Gen Ed - Flexible** | | **[ x ] Gen Ed - College Option** | | **[ ] English Composition** | | **[ ] World Cultures** | | **College Option Detail\_Interdisciplinary Course\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | **[ ] Mathematics** | | **[ ] US Experience in its Diversity** | |  | | **[ ] Science** | | **[ ] Creative Expression** | |  | |  |  | **[ ] Individual and Society** | |  | |  |  | **[x ] Scientific World** | |  | |
| **Effective Term** | **Spring 2016** |

**Rationale:** The Pathways Common Core is the general education requirement in all CUNY colleges. Starting in Fall 2013, CUNY implemented the Pathways initiative across its undergraduate colleges. All baccalaureate students are required to complete one interdisciplinary liberal arts and sciences course. This course provides a topic of interest to multiple disciplines including but not limited to engineering technology, engineering sciences, and environmental science. Students will work across disciplines, learn to recognize varied perspectives, think critically, communicate effectively, and work collaboratively.

**LIBRARY RESOURCES & INFORMATION LITERACY: MAJOR CURRICULUM MODIFICATION**

Please complete for **all** major curriculum modifications. This information will assist the library in planning for new acquisitions; it will not affect curriculum proposals either positively or negatively.

Consult with library faculty subject selectors (<http://cityte.ch/dir>) **3 weeks in advance** when planning course proposals to ensure enough time to allocate budgets if materials need to be purchased.

**Course proposer:** please complete boxes 1-4. **Library faculty subject selector:** please complete box 5.

|  |  |  |
| --- | --- | --- |
| **1** | **Title of proposal**  Energy Resources | **Department/Program**  Chemistry |
|  | **Proposed by** (include email & phone)  Melanie Villatoro [mvillatoro@citytech.cuny.edu](mailto:mvillatoro@citytech.cuny.edu)  718-260-5578  Diana Samaroo [dsamaroo@citytech.cuny.edu](mailto:dsamaroo@citytech.cuny.edu)  718-260-5853 | **Expected date course(s) will be offered**  Spring 2016  **# of students 24** |

|  |  |
| --- | --- |
| **2** | **Are City Tech library resources sufficient for course assignments? Please elaborate.**  Yes, All reading assignments are available through the library databases. |

|  |  |
| --- | --- |
| **3** | **Are additional resources needed for course assignments? Please provide details about format of resources (e.g., ebooks, journals, DVDs, etc.), author, title, publisher, edition, date, and price.**  No additional resources are need from the library. Some resources will be provided by faculty. |

|  |  |
| --- | --- |
| **4** | **Library faculty focus on strengthening students' information literacy skills in finding, evaluating, and ethically using information. We can collaborate on developing assignments and offer customized information literacy instruction and research guides for your course.**  **Do you plan to consult with the library faculty subject specialist for your area? Please elaborate.**  Yes, we will arrange for a Library visit to the classroom upon distribution of their final assignment. Library Faculty will be given a copy of the assignment to assist in personalizing their lecture to the students. |

|  |  |
| --- | --- |
| **5** | **Library Faculty Subject Selector \_\_\_\_**Anne Leonard**\_\_\_\_\_\_**  **Comments and Recommendations**  I look forward to working with instructors of this course to develop an effective research session that will help students complete the final assignment. The assigned readings and bibliography for this course will guide some of my selections for collection development for this department.  **Date 11/26/14** |

**New York City College of Technology**

**Interdisciplinary Committee**

**Application for Interdisciplinary Course Designation**

**Date \_***August 20, 2014***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Submitted by** \_\_*Melanie Villatoro, Diana Samaroo*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Department(s) \_\_\_***CMCE, CHEM\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. **Proposal to Offer an Interdisciplinary Course**

1. Identify the course type and title:  
     
   🞎 An existing course\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   🞎 A new course \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**X** A course under development: ESCI 2000 ***Energy Resources***

Provide a course description:

This special topics interdisciplinary course will survey various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts.

1. How many credits will the course comprise? \_\_*3*\_\_\_\_ How many hours? \_\_*3*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What prerequisite(s) would students need to complete before registering for the course? Co-requisite(s)?

|  |
| --- |
| *ENG1101, MATH 1275* or higher |

1. Explain briefly why this is an interdisciplinary course.

*Energy is conventionally a science subject, however changes in the environment have caused energy, sustainable energy in particular to become a very important subject affected by politics, economic, and ethics. The topic is so great that the President of the United States released an Executive Order on October 5, 2009 regarding the importance of Sustainable Energy systems and the need to pursue their growth.*

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. What is the proposed theme of the course? What complex central problem or question will it address? What disciplinary methods will be evoked and applied?

*Sustainable energy systems are the future of energy in the world. 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. This course will integrate science and engineering with perspectives from economics and politics.*

1. Which general learning outcomes of an interdisciplinary course does this course address?   
   Please explain how the course will fulfill the bolded mandatory learning outcome below. In addition, select and explain at least three additional outcomes.

✓**Purposefully connect and integrate across-discipline knowledge and skills to solve problems**

|  |
| --- |
| *Students will not only learn about the science and engineering aspects of the natural gas, but will also be exposed to the environmental, political, economic and ethical impacts.* |

✓ **Synthesize and transfer knowledge across disciplinary boundaries**

|  |
| --- |
| *As a component of the student evaluation, students will address the diverse perspectives surrounding the natural gas controversy* |

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| 🞎 Comprehend factors inherent in complex problems |

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| ✓ Apply integrative thinking to problem solving in ethically and socially responsible ways |

✓ Recognize varied perspectives

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| *Students will be assigned different roles in the debate forum. They will also exam the different viewpoints of all parties involved in the ongoing controversy regarding “fracking”* |

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| 🞎 Gain comfort with complexity and uncertainty |

✓ Think critically, communicate effectively, and work collaboratively

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| *Students will work in teams, write a research paper, and have a class presentation and debate.* |

✓ Become flexible thinkers

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| *Students will debate and present in class their research findings* |
| 🞎 Other |

**General Education Learning Goals for City Tech Students**

* **Knowledge:** Develop knowledge from a range of disciplinary perspectives, and hone the ability to deepen and continue learning.
* **Skills:** Acquire and use the tools needed for communication, inquiry, creativity, analysis, and productive work.
* **Integration**: Work productively within and across disciplines.
* **Values, Ethics, and Relationships**: Understand and apply values, ethics, and diverse   
  perspectives in personal, professional, civic, and cultural/global domains.

1. How does this course address the general education learning goals for City Tech students?

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| *Students will learn about various energy resources. In the latter part of the course, students will hear from different perspectives regarding the growth of the natural gas industry. Students will need to complete their own research and make a summary of their own findings. Students will have to work in groups and prepare for an in class debate which will address the diverse perspectives surrounding the natural gas controversy.* |

1. Which department would house this course[[1]](#footnote-1)? \_\_*ESCI*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Would all sections of the course be interdisciplinary? 🞎 No **X** Yes

* 1. Would the course be cross-listed in two or more departments? 🞎 No **X** Yes   
     Explain.

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| *The course would be listed in the Chemistry Department as an elective. The department currently offers an Associate in Chemical Technology degree only. Interdisciplinary courses are not required for the AS degree.* |

* 1. How will the course be team-taught[[2]](#footnote-2)? **X** Co-taught **X** Guest lecturers 🞎 Learning community  
     If co-taught, what is the proposed workload hour distribution?

\_*1.5h*\_\_\_\_\_\_\_**X** Shared credits 🞎 Trading credits   
If guest lecturers, for what approximate percentage of the course? ✓ Minimum 20%[[3]](#footnote-3)

Please attach the evaluation framework used to assess the interdisciplinarity of the course.[[4]](#footnote-4)

* 1. What strategies/resources would be implemented to facilitate students’ ability to make connections across the respective academic disciplines?

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| *The course will be team taught and the readings will range from scientific framework of fracking to the ethical viewpoints on this subject matter. Guest lecturers will provide differing perspectives on the natural gas industry, ranging from the political to economic impact.* |

1. Would the course be designated as:

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| **X** a College Option requirement[[5]](#footnote-5)? **X** an elective? 🞎 a Capstone course[[6]](#footnote-6)? 🞎 other? Explain. |

CUNY Common Core Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses may be submitted for only one area of the Common Core. All courses must be 3 credits/3 contact hours unless the college is seeking a waiver for another type of Math or Science course that meets major requirements. Colleges may submit courses to the Course Review Committee at any time. Courses must also receive local campus governance approval for inclusion in the Common Core.

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| College | New York City College of Technology, CUNY | |
| Course Prefix and Number (e.g., ANTH 101, if number not assigned, enter XXX) | ESCI 2000 | |
| Course Title | Energy Resources | |
| Department(s) | Chemistry | |
| Discipline | Environmental Science | |
| Credits | 3 | |
| Contact Hours | 3 | |
| Pre-requisites (if none, enter N/A) | ENG 1101, MATH 1275 or higher | |
| Co-requisites (if none, enter N/A) |  | |
| Catalogue Description | This special topics interdisciplinary course surveys various energy resources: hydropower, solar, wind, geothermal and natural gas. Students learn about the scientific process of energy production and its applications. Students explore economic, social, political, and environmental impacts. | |
| Special Features (e.g., linked courses) |  | |
| Sample Syllabus | Syllabus must be included with submission, 5 pages max recommended | |
| Indicate the status of this course being nominated:  current course  revision of current course  a new course being proposed | | |
| CUNY COMMON CORE Location  Please check below the area of the Common Core for which the course is being submitted. (Select only one.) | | |
| Required  English Composition  Mathematical and Quantitative Reasoning  Life and Physical Sciences | | Flexible  World Cultures and Global Issues  Individual and Society  US Experience in its Diversity  Scientific World  Creative Expression |
| Waivers for Math and Science Courses with more than 3 credits and 3 contact hours  Waivers for courses with more than 3 credits and 3 contact hours will only be accepted in the required areas of “Mathematical and Quantitative Reasoning” and “Life and Physical Sciences.” Three credit/3-contact hour courses must also be available in these areas. | | |
| If you would like to request a waiver please check here: | | Waiver requested |
| If waiver requested:  Please provide a brief explanation for why the course will not be 3 credits and 3 contact hours. | |  |
| If waiver requested:  Please indicate whether this course will satisfy a major requirement, and if so, which major requirement(s) the course will fulfill. | |  |

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| Learning Outcomes  In the left column explain the course assignments and activities that will address the learning outcomes in the right column. | |
| Required Core (12 credits) | |
| ­­A. English Composition: Six credits  A course in this area must meet all the learning outcomes in the right column. A student will: | |
|  | Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence. |
|  | Write clearly and coherently in varied, academic formats (such as formal essays, research papers, and reports) using standard English and appropriate technology to critique and improve one's own and others' texts. |
|  | Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources. |
|  | Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media. |
|  | Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation. |
| B. Mathematical and Quantitative Reasoning: Three credits  A course in this area must meet all the learning outcomes in the right column. A student will: | |
|  | Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables. |
|  | Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems. |
|  | Represent quantitative problems expressed in natural language in a suitable mathematical format. |
|  | Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form. |
|  | Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation. |
|  | Apply mathematical methods to problems in other fields of study. |

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| C. Life and Physical Sciences: Three credits  A course in this area must meet all the learning outcomes in the right column. A student will: | |
|  | * Identify and apply the fundamental concepts and methods of a life or physical science. |
|  | * Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation. |
|  | * Use the tools of a scientific discipline to carry out collaborative laboratory investigations. |
|  | * Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report. |
|  | * Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data. |
| II. Flexible Core (18 credits)  Six three-credit liberal arts and sciences courses, with at least one course from each of the following five areas and no more than two courses in any discipline or interdisciplinary field. | |
| A. World Cultures and Global Issues | |
| A Flexible Core course must meet the three learning outcomes in the right column. | |
|  | * Gather, interpret, and assess information from a variety of sources and points of view. |
|  | * Evaluate evidence and arguments critically or analytically. |
|  | * Produce well-reasoned written or oral arguments using evidence to support conclusions. |
| A course in this area (II.A) must meet at least three of the additional learning outcomes in the right column. A student will: | |
|  | * Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring world cultures or global issues, including, but not limited to, anthropology, communications, cultural studies, economics, ethnic studies, foreign languages (building upon previous language acquisition), geography, history, political science, sociology, and world literature. |
|  | * Analyze culture, globalization, or global cultural diversity, and describe an event or process from more than one point of view. |
|  | * Analyze the historical development of one or more non-U.S. societies. |
|  | * Analyze the significance of one or more major movements that have shaped the world's societies. |
|  | * Analyze and discuss the role that race, ethnicity, class, gender, language, sexual orientation, belief, or other forms of social differentiation play in world cultures or societies. |
|  | * Speak, read, and write a language other than English, and use that language to respond to cultures other than one's own. |

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| B. U.S. Experience in its Diversity  A Flexible Core course must meet the three learning outcomes in the right column. | |
|  | Gather, interpret, and assess information from a variety of sources and points of view. |
|  | Evaluate evidence and arguments critically or analytically. |
|  | Produce well-reasoned written or oral arguments using evidence to support conclusions. |
| A course in this area (II.B) must meet at least three of the additional learning outcomes in the right column. A student will: | |
|  | Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the U.S. experience in its diversity, including, but not limited to, anthropology, communications, cultural studies, economics, history, political science, psychology, public affairs, sociology, and U.S. literature. |
|  | Analyze and explain one or more major themes of U.S. history from more than one informed perspective. |
|  | Evaluate how indigenous populations, slavery, or immigration have shaped the development of the United States. |
|  | Explain and evaluate the role of the United States in international relations. |
|  | Identify and differentiate among the legislative, judicial, and executive branches of government and analyze their influence on the development of U.S. democracy. |
|  | Analyze and discuss common institutions or patterns of life in contemporary U.S. society and how they influence, or are influenced by, race, ethnicity, class, gender, sexual orientation, belief, or other forms of social differentiation. |
| C. Creative Expression | |
| A Flexible Core course must meet the three learning outcomes in the right column. | |
|  | Gather, interpret, and assess information from a variety of sources and points of view. |
|  | Evaluate evidence and arguments critically or analytically. |
|  | Produce well-reasoned written or oral arguments using evidence to support conclusions. |
| A course in this area (II.C) must meet at least three of the additional learning outcomes in the right column. A student will: | |
|  | Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring creative expression, including, but not limited to, arts, communications, creative writing, media arts, music, and theater. |
|  | Analyze how arts from diverse cultures of the past serve as a foundation for those of the present, and describe the significance of works of art in the societies that created them. |
|  | Articulate how meaning is created in the arts or communications and how experience is interpreted and conveyed. |
|  | Demonstrate knowledge of the skills involved in the creative process. |
|  | Use appropriate technologies to conduct research and to communicate. |

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| D. Individual and Society A Flexible Core course must meet the three learning outcomes in the right column. | |
|  | Gather, interpret, and assess information from a variety of sources and points of view. |
|  | Evaluate evidence and arguments critically or analytically. |
|  | Produce well-reasoned written or oral arguments using evidence to support conclusions. |
| A course in this area (II.D) must meet at least three of the additional learning outcomes in the right column. A student will: | |
|  | Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the relationship between the individual and society, including, but not limited to, anthropology, communications, cultural studies, history, journalism, philosophy, political science, psychology, public affairs, religion, and sociology. |
|  | Examine how an individual's place in society affects experiences, values, or choices. |
|  | Articulate and assess ethical views and their underlying premises. |
|  | Articulate ethical uses of data and other information resources to respond to problems and questions. |
|  | Identify and engage with local, national, or global trends or ideologies, and analyze their impact on individual or collective decision-making. |
| E. Scientific World A Flexible Core course must meet the three learning outcomes in the right column. | |
| This will be measured in their conclusions of the case study. | Gather, interpret, and assess information from a variety of sources and points of view. |
| This will be measured through the midterm paper. | Evaluate evidence and arguments critically or analytically. |
| This will be measured through the midterm paper and case study. | Produce well-reasoned written or oral arguments using evidence to support conclusions. |
| A course in this area (II.E) must meet at least three of the additional learning outcomes in the right column. A student will: | |
|  | Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology-related studies. |
| This will be measured in classwork, i.e. quizzes, exams, and class discussions. | Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions. |
|  | Articulate and evaluate the empirical evidence supporting a scientific or formal theory. |
| This will be measured through the midterm paper. | Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities. |
| This will be measured through the case study assignment. | Understand the scientific principles underlying matters of policy or public concern in which science plays a role. |

1. An interdisciplinary course for the College Option requirement may be housed in a department that is not liberal arts. [↑](#footnote-ref-1)
2. Attach evidence of consultation with all affected departments. [↑](#footnote-ref-2)
3. While an interdisciplinary course must be team-taught, there is no formal percentage requirement, but this minimum is a guideline. [↑](#footnote-ref-3)
4. In the case that a course is equally taught, include proposed plans for faculty classroom observation and student evaluation of teaching. [↑](#footnote-ref-4)
5. To qualify for the College Option, such a course must also meet the New York State definition of a liberal arts and sciences course.  
   <http://www.highered.nysed.gov/ocue/lrp/liberalarts.htm> [↑](#footnote-ref-5)
6. A course proposed as a Capstone course must be separately approved by the Capstone Experience Committee. [↑](#footnote-ref-6)