ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE OUTLINE FORM

# COLLEGE OF SCIENCE

Chester F. Carlson Center for Imaging Science

**REVISED COURSE**: COS-IMGS-181 Innovative Freshman Experience I

**1.0 Course Approvals**

| **Required course approvals:** | **Approval Requested Date:** | **Approval Granted Date:** |
|---|---|---|
| Academic Unit Curriculum Committee | 4/30/13 | 5/7/13 |
| College Curriculum Committee | 9/23/2013 | 11/11/2013 |

| **Optional designations:** | **Is designation desired?** | | ***Approval request date:** | ****Approval granted date:** |
|---|---|---|---|---|
| General Education: | Yes √ | No | 11/11/2013 | 11/20/2013 |
| Writing Intensive: | Yes | No √ | | |
| Honors | Yes | No √ | | |

**2.0 Course information:**

| | |
|---|---|
| **Course title**: | Innovative Freshman Experience I |
| **Credit hours:** | 3 |
| **Prerequisite(s):** | First year status, or permission of instructor |
| **Co-requisite(s)**: | None |
| **Course proposed by:** | Chester F. Carlson Center for Imaging Science<br>Undergraduate Curriculum Committee |
| **Effective date:** | 8/26/2013 |

| | **Contact hours** | **Maximum students/section** |
|---|---|---|
| Classroom | 3 | 20 |
| Lab | | |
| Studio | | |
| Other (specify) | | |

**2.1 Course Conversion Designation (Please check which applies to this course)**

| | |
|---|---|
| X | Semester Equivalent (SE) Please indicate which quarter course it is equivalent to:<br>10 51 253 Freshman Imaging Project I |
| | Semester Replacement (SR) Please indicate the quarter course(s) this course is replacing: |

| | |
|---|---|
| | New |

**2.2 Semester(s) offered** (check)

| | | | |
|---|---|---|---|
| Fall X | Spring | Summer | Other |

All courses must be offered at least once every 2 years. If course will be offered on a bi-annual basis, please indicate here:

**2.3 Student Requirements**

| |
|---|
| **Students required to take this course**: (by program and year, as appropriate)<br>First year Imaging Science (COS) and Motion Picture Science (CIAS) students |
| **Students who might elect to take the course**:<br>First year students from any discipline, particularly those in scientific, engineering, or technology majors, or students in University Studies, General Science Exploration, or Engineering Exploration. |

**3.0 Goals of the course** (including rationale for the course, when appropriate):

The primary goal of this course (the first of a two-course sequence) is to expose first year students to the fundamental principles and methods of science and technology by using an innovative, interactive, project-based approach.

**4.0 Course description** (as it will appear in the RIT Catalog, including pre- and co-requisites, and quarters offered). Please use the following format:

**COS-IMGS-181 Innovative Freshman Experience I**

Innovative Freshman Experience I is the first of a two-course sequence. Through the exploration of concepts in physics, math, and computer science, students will experience the creation of a system to address a contemporary technological need through the application of the principles of the scientific method. With the help of faculty and staff from different departments across campus, as well as external experts, students will plan and organize the effort, review current literature applicable to the posed technical challenge, apply hypotheses to address presented scientific questions, conduct experiments to assess technology options, integrate components to create a prototype, and confirm that the prototype and methods meet desired levels of performance. The students will develop a working knowledge of the scientific method and an appreciation for the value of teamwork in technical disciplines, develop the skills required to execute a large project, and increase proficiency in oral and written technical communication. (Prerequisites: First year status, or permission of instructor.) **Class 3, Lab 0, Credit 3 (Fall)**

**5.0 Possible resources (texts, references, computer packages, etc.)**

Students will be required to research course-related topics using online journal article databases and other library resources. No single textbook will be assigned, but typical resources may include:

5.1 Young, H. and Freedman, R., University Physics, Pearson Addison-Wesley, San Francisco, California.

5.2 Halliday, D., Resnick, R., Walker, J., Fundamentals of Physics, John Wiley and Sons,

New York.
5.3 Weir, M. and Hass, J., Thomas, Calculus: Early Transcendentals, Addison-Wesley, Reading, Massachusetts.

## 6.0 Topics (outline):

In this predominantly student-led, project-based class, the students will investigate the basic physics, math, and computer science concepts applicable to solving a real-world problem. During this investigation students will also develop plans of work for completing the project and communicate that plan to a panel of experts.

Some of the topics will include, but may not be limited to the following:

- Introduction to scientific research
- Scientific principles (examples)
    - Mathematical modeling
    - Electricity and magnetism
    - Optics
    - Scattering, reflection, transmittance
    - Acoustics
    - Human physiology
- Use of library and databases
- Experimentation and laboratory practices
- Project management

## 7.0 Intended course learning outcomes and associated assessment methods of those outcomes

| Course Learning Outcome | Assessment 1 | Assessment 2 |
|---|---|---|
| Students will explain the initial steps of the scientific method and scientific discovery | Team report | Workflow diagram |
| Students will integrate basic principles in math and physics to analyze components in a system | Lab report | Oral presentation |
| Students will demonstrate proficiency in oral and written technical communications | Précis and preliminary design review | Oral presentation |
| Students will integrate innovation and creativity in their approach to problem solving | Team report | Oral presentations |

## 8.0 Program outcomes and/or goals supported by this course

8.1 For Imaging Science majors, this course will provide students with the opportunity to apply knowledge and skills in imaging science as a contributing member of a multi-disciplinary team.
8.2 For Motion Picture Science majors, the course will develop communication and leadership skills that allow for successful collaboration and efficient team dynamics for

| |
|---|
| working in a collaborative medium. |

**9.0**

| | General Education Learning Outcome Supported by the Course | Assessment Method |
|---|---|---|
| ***Communication*** | | |
| | Express themselves effectively in common college-level written forms using standard American English | |
| | Revise and improve written and visual content | |
| x | Express themselves effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing) | Oral presentations to classmates and professional meetings |
| x | Comprehend information accessed through reading and discussion | Précis, oral presentations in class |
| ***Intellectual Inquiry*** | | |
| | Review, assess, and draw conclusions about hypotheses and theories | |
| | Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions | |
| | Construct logical and reasonable arguments that include anticipation of counterarguments | |
| | Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information | |
| ***Ethical, Social and Global Awareness*** | | |
| | Analyze similarities and differences in human experiences and consequent perspectives | |
| | Examine connections among the world's populations | |
| | Identify contemporary ethical questions and relevant stakeholder positions | |
| ***Scientific, Mathematical and Technological Literacy*** | | |
| | Explain basic principles and concepts of one of the natural sciences | |
| x | Apply methods of scientific inquiry and problem solving to contemporary issues | Lab reports, oral presentations |
| | Comprehend and evaluate mathematical and statistical information | |
| | Perform college-level mathematical operations on quantitative data | |
| x | Describe the potential and the limitations of technology | Pugh analysis matrix, lab reports |
| | Use appropriate technology to achieve desired outcomes | |
| ***Creativity, Innovation and Artistic Literacy*** | | |
| x | Demonstrate creative/innovative approaches to course-based assignments or projects | Prototype definition delivered at a preliminary design review |
| | Interpret and evaluate artistic expression considering the cultural context in which it was created | |

**10.0 Other relevant information** (such as special classroom, studio, or lab needs, special scheduling, media requirements, etc.)

This course will be conducted in a dedicated space in the Carlson Building, specifically designed for this purpose. The space features all of the infrastructure and features the students will need to collaborate on this project, including areas which facilitate group discussions and brainstorming as well as areas equipped for bench testing and system construction. Access to the space will be controlled by electronic card swipe, and students enrolled in the course will have 24-hour access.

**11.0 Supplemental information for Optional Course Designations: If the course is to be considered as writing intensive or as a general education or honors course, include the sections of the course syllabus that would support this designation.**

**11.1 General Education Committee:**

**Feedback to course proposers:**

# Programform.doc
NYSED Documentation Form

### Audience
This document is intended for all department chairs and program directors.

### Summary

This document includes the information and required forms for submission of program to NYSED for semester conversion.

# Change Log

| Responsible | Date | Version | Short description |
|---|---|---|---|
| Chris Licata | 6/15/2010 | 1 | Document originator |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |