Soft Interfaces IGERT Program of Study

Key features of the Syracuse Soft Interfaces IGERT program are:

- early engagement in research
- interdisciplinary courses
- training in science policy and science communication

The table below outlines the program of study for the first two years. It is expected that after that the students will be mainly engaged in research and supported on various research projects.

Fall (Year 1)	**Spring (Year 1)**	**Summer (Year 1)**
1-3 courses in home Department	1-2 courses in home Department	Research or Internship
Physical Cell Biology BEN/BIO/CEN/CHE/PHY 635*	*Science, Technology, and Public Policy* PAI 772**	
Lab Experience	*Open Problems in Soft Interfaces* BEN/BIO/CEN/CHE/PHY 638*	

Fall (Year 2)	**Spring (Year 2)**	**Summer (Year 2)**
Core and/or advanced course in home department or other participating department[##]	COM 600: Multimedia Reporting: Climate Change ***OR*** COM 600: Sustainability Science and the Media Core and/or advanced course in home department or other participating department[##]	Research or Internship
Ethical Issues in Engineering & Research BEN 600[#]	Special topic course[##]	

*Register using the prefix appropriate to your program of study.
** Other courses may be available. Please consult your advisor.
[#]Temporary number.
[##]To be determined individually in consultation with your advisors and depending on available course offerings

Revised 11/20/14

Note: As Fellows, IGERT Trainees have 30 hours of tuition credits per year (12+12+6). Although they are not required to use all hours in any given semester, they are encouraged to make wise use of the tuition credit to ensure that by the end of the second year they have accumulated the minimum credit hours required by their program for a doctoral degree. The total credit requirements for each degree are as follows:

Biology …….. 48 (24 from formal courses)
Biomedical Engineering ……. 42
Chemical Engineering ……. 42 (24 in CEN courses)
Chemistry …… 48 (18 of required CHE courses)
Physics …….. 48

BEN/BIO/CEN/CHE/PHY 635 - *Physical Cell Biology* – This central IGERT course will emphasize current quantitative advances in cell biology and cover topics such as the structure and dynamics of cell membranes, the dynamics of the cytoskeleton and molecular motors, DNA replication and repair, genome packing, gene regulation, and signaling pathways. The course will be co-taught by biology and physics faculty.

BEN/BIO/CEN/CHE/PHY 638 - *Open Problems in Soft Interfaces* – This is a seminar-style course on the critical analysis of the current literature on interfaces, where the students will define the frontiers of interface research by identifying unsolved problems. Small interdisciplinary groups will scour online databases for "hot" articles or research groups associated with a particular research topic (e.g., biomaterial interfaces relevant to a particular disease or injury; fundamental interface problems in soft matter physics; techniques for patterning surfaces; mechanisms for bacterial biofilm control; novel mechanisms for drug delivery) ultimately selecting a single paper to be pitched to the entire class for in-depth consideration by all. Following this selection, several students will lead the discussion of the article. This course may be taken more than once, if so desired.

PAI 772 - *Science Policy Course* – The students will take a course in science policy at the Maxwell School. An IGERT scientist will work alongside Maxwell faculty to ensure the course is relevant and accessible to IGERT students. The goal of this requirement is to provide the students with a perspective on how science affects policy and how policy affects science, at a deep enough level that it may help guide their careers and promote positive involvement in policy.

BEN 600 - *Ethical Issues in Engineering & Research* – This course is designed to enable students to appreciate the critical importance of ethical conduct in their professions, recognize ethical issues when they occur, and make ethically sound decisions in dealing with those issues. IGERT Fellows can take the course for 1, 2, or 3 credits (depending on their interests and the requirements of their PhD program of study) with the course requirements scaling proportionally with the credit level.

COM 600 – *Multimedia Reporting: Climate Change* - This course will immerse students in the principles and practices of writing and producing stories about the science of and adaptation to climate change and sustainability. Along with traditional forms, the students will be exposed to the use of new science story telling tools, including data visualization, 3D animation and virtual worlds. The final class project will be an interactive, multimedia magazine that the students will design and execute.

COM 600 - *Sustainability Science and the Media* - This course will introduce students to the issues and challenges involved in communicating complex environmental topics to the public, through both analysis of media coverage and hands-on training. We will examine how various types of media convey information (or don't) on a variety of sustainability-related topics—things like drought, pollution, biodiversity loss, extreme weather, resource extraction—and look at how media attention influences (or doesn't) public opinion. We will also explore the roles and responsibilities of scientists who do research in these areas. And we will look at ways that scientists can help the public become better informed about the environmental issues that will shape our world over the next century.

Lab Experience – Early engagement in interdisciplinary research is an important feature of the IGERT program. To facilitate this all students are required to have a one-semester lab experience, which may take one of several forms listed below, after consultation of the student with his/her departmental academic advisor and the IGERT advisor. To satisfy this requirement students must choose <u>one</u> of the following:

1. The student works on a project in multiple research labs (or a single lab) for 11-12 weeks, for a number of hours roughly corresponding to what expected for a 3-credit course. *If allowed by departmental rules*, students are asked to register for an Independent Study course (BIO/BEN/CEN/CHE/PHY 690) and get credit for their work. In the choice of research projects, it should be kept in mind that a central goal of the IGERT is to seed collaborative projects among local researchers. For this reason chosen projects must at least have the potential of becoming collaborative, if they are not so already.

2. The student visits the group of 8 different faculty members who are IGERT participants (with at least half of these being in departments different from the student's home department) to learn about their research. The student should pay 1-2 visits to each chosen labs to observe what people do and ask questions. At the first visit, the student will be assigned a reading on the topic of the research carried out in the lab. The student's academic advisor must agree to supervise this activity and discuss the reading with the student, keep track of the labs visited and verify that the student has done the work. *If allowed by departmental rules*, students are asked to register for an Independent Study course (BIO/BEN/CEN/CHE/PHY 690) and get credit for their work. In all cases the academic advisor must inform in writing the IGERT Director that the students plans to satisfy the *Lab Experience* requirement following this path and send a brief report at the end of the semester.

3. Other mechanisms for satisfying this requirement may be developed jointly by the advisors and the student. They must be approved by the IGERT Program Director.

4. Lab Rotations required in Biology satisfy the *Lab Experience* requirement.

The chosen plan on how each student will satisfy the *Lab Experience* requirement must be finalized and communicated to your advisors no later than the first day of the second week of classes.

Students who become IGERT Trainees in their second year of graduate studies (or later) and are already involved in research may have this requirement waived. Such requests must be sent to the IGERT Program Director via email no later than the first day of the second week of classes.

Additional Requirements for IGERT Trainees and Associates

IGERT Seminar & Social – IGERT Fellows and Associates are required to participate in this informal meeting, generally held once every two weeks. Dates and times, as well as location, will be communicated at the start of each semester.

IGERT Retreat – This is an annual one-day meeting of the Syracuse Soft Interfaces IGERT community. It will generally be held on campus on a date to be announced every year. Members of the IGERT External Advisory Board will attend the meeting and participate in the sessions. Students will have the opportunity to give posters and oral presentations on their research. All IGERT participants (Fellows, Associates and faculty) are expected to participate in the annual IGERT Retreat.

Advising

Students are generally assigned an advisor by their home department. In addition, first year students will be assigned an ``IGERT Advisor'', who will be a faculty member generally from a department other than their home department. Students should meet with their IGERT Advisor at the beginning of the school year, and at least once every semester after that. Finally Cristina Marchetti, IGERT Program Director (mcm@phy.syr.edu) is available to arrange meetings with students at any time.

For all administrative matters, course, registration, etc., please consult Ms. Michelle Lissner, IGERT Program Coordinator (melissne@syr.edu 315-443-3467, Rm 307 Physics Building).