

Syllabus: Freshman Imaging Project I
1051-253
Fall Quarter, 2012-2013 Academic Year

Overview:

The Freshman Imaging Project is a year-long sequence of courses built around a single project aimed at designing, developing, and building a functional imaging system through a unified team effort. With the help of faculty and staff from across the imaging science program, students will plan and organize the effort, conduct trade studies as appropriate to assess technology options, and validate that the resulting system meets desired levels of performance.

This approach to technical education emphasizes real-world, hands-on problem solving by student-led interdisciplinary teams. It offers participating students a degree of autonomy and responsibility rarely found at the freshman level. Students who participate in this project will demonstrate the following outcomes:

- a general understanding of the foundational concepts of imaging science,
- an in-depth knowledge of at least one aspect of imaging science,
- a working knowledge of the principles of systems engineering,
- proficiency in oral and written technical communication,
- an appreciation for the value of interdisciplinary teamwork in technical disciplines, and
- innovation and creativity in their approach to problem solving

For the fall quarter, students will work with prospective users of their system to define relevant performance parameters, document a system specification, and develop plans for a series of technology trade-off studies. The fall quarter will culminate with a "Preliminary Design Review" in which an external board of evaluators assesses whether sufficient progress has been made to proceed with the next phase of development.

Instructor:

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Office Hours: My schedule is highly variable from day to day. Please contact me by e-mail to arrange a mutually agreeable time if you need to meet with me.

Other faculty and staff from the Center for Imaging Science will serve as “mentors” for this group throughout the year. Contact information for these individuals is available on the CIS web site (www.cis.rit.edu).

Schedule & Location:

There are two labs in the Carlson Building which have been designated as dedicated space for the Freshman Imaging Project. Regular class meetings will be on Tuesdays and Thursdays from 1:00 pm – 2:50 pm in the Carlson Building, room 3125 (Freshman Imaging Laboratory). Students also have access to a laboratory known as the “Bat Cave” in room 2205. These rooms are dedicated spaces, for use only by students enrolled in the Freshman Imaging Project.

Please note that the scheduled class meetings will NOT provide sufficient time to accomplish all of the tasks needed to meet this quarter’s goals. Students will need to devote a significant amount of time outside of class in order to achieve the project’s objectives. Therefore, students registered for this class will have 24/7 card swipe access to the two rooms indicated above. **No food or drinks (including water) are allowed in either area at any time.**

Textbook:

Students are not required to purchase a textbook for this class. Students will however need to seek out, read, analyze, and report on suitable materials from online databases and other library resources.

Class Wiki:

The class wiki is a student-managed online repository for all class-related material, including relevant references as well as student-generated information such as documents, presentations, data, images, etc. All enrolled students have access to the wiki and are expected to contribute material. The URL for the class wiki is <https://wiki.rit.edu/display/1051253012121>. It can also be accessed by the link on the menu bar at the top of the class MyCourses page.

Assignments:

There will be several types of tasks assigned throughout the quarter. These assignments will include:

- ***Library Research.*** When assigned to research specific topics, each student will be expected to identify and read **scholarly sources** related to that topic. In general, information in the popular literature or on web sites intended for broad audiences are not considered appropriate for these assignments. Suitable sources will typically consist of articles taken from peer-reviewed journals, or other professional publications intended for practitioners in the field. Be prepared to discuss all researched topics in class.

- **Written Précis.** Unless otherwise noted, all library research will be accompanied by a written précis in which the student should include:
 - A full citation indicating where the source was obtained
 - A short but complete summary of the content in the source
 - A critical analysis of the source
 - A short but complete summary of what you got from the source, and an indication of how this may inform our work on this project

All précis will be posted on the class wiki. In general you will be expected to address each of the items on the list above in sufficient depth to convince the instructor and your classmates that you have read (and in many cases, re-read) the source and have critically considered its value to the field and this course. There are no restrictions on their length, however précis less than two typed pages long (double spaced, 12 point, 1" margins) will likely be inadequate.

- **Equipment Surveys.** These are informal presentations to the class which introduce your fellow students to a piece of equipment, a tool, a process, or a skill which might be useful as we work through this project. Equipment surveys will be performed by teams of three or four, in accordance with a schedule which will be established at the beginning of the quarter. During a survey, the presenting team will be expected to describe the function of the device and conduct a live demonstration of its use. If the device being demonstrated is too large to bring into our lab, the demonstration can take place in the lab where the item is located. Teams must submit written proposals for their equipment surveys at least one week prior to the presentation/demonstration. It is strongly recommended that teams enter into preliminary discussions with the instructor regarding possible topics as far in advance as possible. Each survey should be from 15-30 minutes long, although deviations from these guidelines may be permitted with prior approval of the instructor.
- **Formal Oral Presentations.** Each student will be expected to contribute to a team oral presentation. Unless otherwise noted, these presentations will take place in weeks 8, 9, and 10.

Evaluation:

The general principles used to assess student performance in the fall quarter include:

- **Inputs from multiple sources.** The most accurate assessment of performance will result when the viewpoints and opinions of multiple individuals are considered, including that of the individual being graded.
- **Based on attitude, effort, and contribution.** Students in the Freshman Imaging Project are given an unprecedented amount of independence. However, with that independence

comes the responsibility to approach this experience with a positive attitude and a desire to learn and grow. That positive attitude is manifested by an honest effort in which the activities of each individual reflect a genuine desire to help the group accomplish its goals and move the project forward. Therefore, the performance of each individual will be assessed on the basis of their attitude toward their responsibilities within the project, the quality of the effort they devote to these responsibilities, and the degree to which those efforts contribute to the good of the team and the objectives of the project.

- ***Frequent, timely and relevant data.*** Each person should have ample opportunity to reflect and act on information they receive regarding their performance on this project.

The assessment plan includes two primary elements. Each element will contribute to the overall assessment of the students' performance. Currently each element is weighted equally. The elements are as follows:

- ***Monthly one-on-one meetings with the instructor.*** These meetings will give each student the opportunity to discuss directly with the instructor any concerns or issues which may have a bearing on their performance on this project. They will also allow the instructor to give each student a mid-term assessment of their performance to date, and suggest ways to improve, if necessary. These meetings will take place during weeks 3, 6, and 9.
- ***"360 degree" reviews.*** At the end of the term each student will provide an honest assessment of his or her own performance. In addition, each person will evaluate, and will be evaluated by, all other participants in the project, including their peers, the instructor, and the teaching assistant. A student-developed survey will assist each of the participants perform this review.

Shared Expectations for Ethics and Professional Integrity

RIT and The Center for Imaging Science expect all students to pursue their studies in an ethical manner. Details of these expectations are posted on the CIS web site at http://www.cis.rit.edu/files/Expectations-PersonalEthicsProfessionalIntegrity_8_10_2011.doc. Copies of this document will be made available on the first day of class. All students will be asked to sign and return the document to acknowledge their receipt of this information and their understanding of the consequences of violating the policy.

Fall Quarter Overview

The Freshman Imaging Project is structured to simulate an authentic design and development experience. Consequently, the week-to-week schedule is dynamic and varies in response to an ongoing assessment of the group's progress toward the project goals. However there are several milestones which must be met:

Week 1:

- Introduction to the design project
- Introduction to library research
- Wiki training
- First meeting with prospective system “user”

Week 2:

- Screening of video scavenger hunts

Week 3:

- Begin equipment surveys
- First round of 1-on-1 meetings with instructor

Week 6:

- Second round of 1-on-1 meetings with instructor (note: short week)

Week 8:

- Presentation to General Science Exploration students

Week 9:

- Final round of 1-on-1 meetings with instructor
- Final equipment survey
- Presentation at Imaging Science & Technology meeting

Week 10:

- Preliminary Design Review

Lab Safety

The Freshman Imaging Project is a rigorous, hands-on, laboratory-oriented course. Students enrolled in the course will be exposed to equipment and procedures which could potentially cause harm. Consequently, students should not attempt to use such equipment unless they have been properly trained on its use. Lab safety will be discussed in more detail throughout the quarter.

Please note that due to the nature of this course, all of the information in this syllabus is subject to change.

Good luck!

RULES OF THE FRESHMAN IMAGING LAB

1. Safety first. Don't attempt to use any equipment you haven't been trained to use. A two-person rule must be followed any time students are using potentially hazardous equipment and any time students will be in the lab for any purpose between 6 p.m. and 6 a.m.
2. No food or drink of any kind in any of the freshman labs, EVER.
3. All equipment checked out of the stockroom must be returned as soon as it is no longer being used. Other lab tools and equipment must be put away in the appropriate place as soon as they are no longer being used. Your instructor will not clean up the lab for you.
4. Treat the laboratory and all equipment with professionalism and respect.
5. Hang coats on the rack outside the lab. Put backpacks in/on the lockers and under the tables/benches.
5. Last one out turn off the lights and close the door.