

~NatSci 489 SH (iCons 4 Spring Module) “Integrative Science Senior Exposition Seminar”

Syllabus Spring 2019

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Prerequisites: Completion of iCons 4 Fall (Natsci 489 FH) with a grade of “C” or better

Credits: 1.00

Course Catalog Description:

NatSci 489 SH enhances the thesis research experience for students in the iCons program through peer support teams and advanced scientific communication as students prepare to present their research findings at the Statewide Undergraduate Conference and at the iCons Senior Exposition. *This course satisfies Integrative Experience criterion #1 by providing a structured context for students to reflect on and to integrate their previous learning as they prepare to present their senior research findings in these two public forums.* This seminar, in combination with the iCons 3 course already taken (either Bio 383H or NatSci 389H), fulfills the university’s Integrative Experience requirement.

University of Massachusetts Integrative Experience Criteria

See <http://www.umass.edu/gened/teachingAdvising/integrativeExperience/ie.html>

1. IE1 = Providing a structured, credited context for students to reflect on and to integrate their learning and experience from the broad exposure in their General Education courses and the focus in their majors.
2. IE2 = Providing students with the opportunity to practice General Education learning objectives such as oral communication, collaboration, critical thinking, and interdisciplinary perspective-taking, at a more advanced level.
3. IE3 = Offering students a shared learning experience for applying their prior learning to new situations, challenging questions, and real-world problems.

Integrative Experience:

The General Education Integrative Experience is intended to provide a framework for deep exploration of General Education skills and knowledge (#2), the development and application of those in a real-world context (#3), and opportunity for personal reflection leading to an understanding of how the cumulative learning experiences from GenEd, the major, and other activities has led to an integrated, valuable, and unique undergraduate education for each individual (#1). From the General Education purpose statement: “Integrative learning comes in many varieties: connecting skills and knowledge from multiple sources and experiences; applying theory to practice in various settings; utilizing diverse and even contradictory points of view; and understanding issues and positions contextually.” As fourth-year iCons students, you have experienced all of these forms of integrated learning throughout your academic career, especially in your iCons courses. By now, you understand the process and appreciate the value of reflecting on your experiences and seeking a deeper expression of what those experiences have provided to you and to others through your work and service to your discipline(s).

In iCons 3, you demonstrated excellence in IE criterion #2 (practicing GenEd skills such as collaboration and communication at a more advanced level) and criterion #3 (applying prior learning to new situations and real-world problems). In this 1-credit seminar, we will focus on IE criterion #1, by providing a structured context for you to reflect on and to integrate your learning and experience from the broad exposure in your GenEd courses, your focus in your major, and the unique context of iCons. The

Commented [A1]: This course is a 1-credit offering focused on criterion 1 of the IE requirement. Prior to enrolling in this course, students are expected to have fulfilled criteria 2 and 3 in a different course.

Commented [A2]: This portion, following the more general breakdown of the IE criteria, underscores the value of integrating one’s learning, both from General Education courses and those within the major.

Commented [A3]: This articulates for students the connection across the two-sequence IE courses, highlighting the focus on reflection and integration in this course.

combination of these courses (iCons 3 and iCons 4 seminar) fulfills the GenEd IE graduation requirement. The specific activities (see below) will provide an evolving framework for you to identify discrete learning gains, their origins, and their ultimate value to you as you individually conduct your research and as you collectively bring your new scientific insight together in a meaningful and collaborative way. Such course activities are designated below in the Week-by-Week schedule (pp. 4-5) as “IE1 Focus” activities.

The Final iCons Component:

The mission of the iCons Program is to produce the next generation of leaders in science and technology with the attitudes, knowledge, and skills needed to solve the inherently multifaceted problems facing the world. This course is the final step along your pathway to becoming young leaders in your fields, by finalizing and reflecting upon the insights and wisdom you have gained along your undergraduate career. At the end of this course and hence the iCons Program, we expect that you will be able to identify important societal problems, recognize the role that science and technology will play for a given problem, articulate the fields of inquiry needed to address the problem, work effectively in diverse teams to advance understanding, and develop the habits of mind and reflective skills of life-long-learners.

Student Learning Goals:

- Integrate learning from present and previous study to promote general applicability of key attitudes, knowledge, and skills (i.e., wisdom) developed during your college years. (IE1 Focus)
- Engage in self-reflection as learners; providing and utilizing constructive criticism.
- Enhance awareness of effective team function by contributing to and improving effective team function.
- Communicate and contextualize research motivation and findings, orally and in writing, to scientists and non-scientists.
- Share research in a public forum.

Prerequisites:

- iCons 1: “NatSci 189H -- Global Challenges, Scientific Solutions.”
- iCons 2: “NatSci 289H -- Integrated Scientific Communication” (section 1 for iCons students in the Biomedicine/Biosystems track; section 2 for iCons students in the Renewable Energy track).
- iCons 3: “NatSci 389H -- Team-oriented Lab Discovery in Renewable Energy” for iCons students in the Renewable Energy track; or “Bio 383H -- Gene and Genome Analysis” for iCons students in the Biomedicine/Biosystems track.
- iCons 4: “NatSci 489 FH”

Course Components:

- Bi-weekly peer-support team meetings
- Bi-weekly team-assessment diaries
- Integrative Experience in readings, reflections, and writings
- Producing PowerPoint or poster presentations of research
- Presenting research findings at Statewide Undergraduate Research Conference
- Presenting research findings at iCons Senior Exposition

Process for choosing speakers at iCons Senior Expo (4 students):

- ~March 15th: iCons 4 instructor solicits nominations from research advisors for students who (a) have a great story to tell and (b) can tell the story well.
- ~April 1st: nominations from advisors are due to iCons 4 instructor.
- ~April 11th: Senior Expo speakers chosen and announced.

Meeting Schedule and Course Mechanics:

1. Near the beginning of the semester for discussion of a text that stimulates the integrative experience and the process of reflection (e.g., "Siddhartha" by Hermann Hesse);
2. Mid-semester to discuss thesis outlining/writing;
3. Mid-semester to prepare for the Statewide Undergraduate Research Conference; Additionally, all iCons4 students will attend and present their research
5. Mid semester Poster Presentation on Research, ~March20
6. At the Statewide Undergraduate Research Conference, Friday, April 26, 2019
7. At the end of the semester at the iCons Senior Exposition, TBA
8. Personal IE Reflective Essay: Due May 01, 2019

Your peer-support team (already formed in the fall semester during NatSci 489 FH) will meet roughly every other week throughout the spring semester to share IE-related reflections, to support each other's research, and to critique practice presentations. Students submit bi-weekly Teamwork Effectiveness Diaries on alternate weeks. The NatSci 489 SH instructor will join each peer support team's first meeting of the spring semester, if possible. The semester culminates with the public presentation of research findings at the iCons Senior Exposition. Woven through the semester, starting in week 3 (see below), each student iteratively develops a reflective narrative addressing his or her progress and intellectual growth through college.

Personal IE Reflective Essay: (Due May 01, 2019)

As a semester-long assignment, you will construct a (min 750 words) narrative on your intellectual / personal journey through college. In this narrative, you are asked to address how you came to be the scholar you are now. This narrative should be developed iteratively, subject to peer and instructor critique, with the objective of obtaining a deeply meaningful statement of personal and academic growth. In considering growth, we will ask about the major or minor turning points in your career as a UMass Amherst student, incorporating experiences from your major, from your GenEd courses, from your elective activities, and from the iCons program, that have prepared you for success both in conducting your research and in translating that research to a larger societal challenge. As a starting point, you should consider the following themes:

- Complex problem-solving challenges (e.g., possibly involving any of your iCons work, but not limited to iCons work) that required integration of attitudes, knowledge, and skills across disciplines (specifically incorporating your unique palate of Gen Eds, major courses, and extra-curriculars) -- Did you have some success or not? In either case, what lessons of wisdom did you take away that may have changed your world view?
- Character-building experiences (e.g., significant academic "mistakes" or "mishaps," required courses that "in the moment" were otherwise uninspiring, extended periods of academic confusion and/or frustration) that upon reflection have changed who you are as a scholar and/or problem-solver, or that may likely change in the future who you will be as a scholar or problem-solver.
- Shared learning experiences that required you to work with an intellectually diverse team to solve complex, real-world problems by drawing on the distributed expertise of your team, and led you to think and communicate using an interdisciplinary set of values and perspectives. What did you do to better understand your teammates from other fields? How did you communicate your own scientific perspective in an effective way? What was the benefit of working with an intellectually diverse team?

Commented [A4]: The course begins with a reading and discussion to help students begin the process of reflection and integration.

Commented [A5]: The reflective essay, while a final product of the course, is woven throughout the semester, demonstrating the importance of ongoing and iterative reflective practice.

Commented [A6]: As the culminating assignment of this course, the personal reflective essay prompts students to reflect on their full UMass educational experiences, drawing connections between their General Education courses and those in the major.

Commented [A7]: Students receive peer and instructor feedback throughout to help develop their reflections and strengthen their own understanding of growth.

Commented [A8]: Students are provided prompts to help spur their reflective thinking.