

Examples of Interdisciplinary Capstone Courses/Experiences

Bucknell University A Capstone course may promote integration within and across several disciplines and may be created in any one of several ways: by one or more departments or programs, by faculty members individually or as groups. A group of students who wish to study an interdisciplinary topic in a seminar format may petition to have their study overseen by a faculty member and recognized as a Capstone Experience. Small seminars of approx 15 students.

Goucher College IDS 300. Making Connections: A Service-Learning Liberal Arts Capstone Multidisciplinary capstone experience to help seniors put their own majors in a larger context by examining interrelationships among their courses, between their own major and other majors, and between their liberal arts college experience and issues in the off-campus community. Students will work cooperatively as a team and explore the contributions of different liberal arts academic disciplines to address social and civic issues. Process and results will be presented both on and off campus. Large fieldwork component to be carried out as part of Goucher's partnership with the HARBEL Community Organization in northeast Baltimore City. Prerequisites: Senior standing and permission of the instructor.

Rice University Beyond Traditional Borders (BTB), a new hands-on learning initiative for students that transcends disciplines and geographic boundaries to develop medical technologies that can help save lives in developing countries, like Botswana and Honduras. It includes a track for engineering and science majors and one for humanities, social science and policy majors. The plan is to have both engineering and non-engineering majors take a course their freshman year to introduce them to global health issues, split up the majors for the sophomore and junior classes so that each can be assigned hands-on design challenges appropriate for their skill set, and then bring them all back together for a two-semester interdisciplinary capstone design experience. Students may also take global health-related courses other Rice departments offer as electives.

University of Missouri-Columbia Only interdisciplinary capstone is for Interdisciplinary Studies majors, but extensive materials on capstones, which are required for all majors. All capstones listed by discipline at <http://generaleducation.missouri.edu/requirements/capstone.html>

University of South Carolina University 401 – Senior Capstone Experience –seminar course with students doing original research and exchanging results through reports and discussions. University 401 reviews the accomplishments of the undergraduate experience and prepares students for their transition out of the university into either the workplace or graduate studies. Students enrolled in specific sections of University 401 usually share the same academic major and/or career goals (i.e. pre-med, pre-law, journalism and mass communications, industrial chemistry, etc.) The course is designed to assist students in bringing closure to their college experience through systematic, intentional reflection on both the student's major and, in general, their liberal arts education. Students do original research and exchange their results through reports and discussions

Capstone Experience

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A capstone experience in the major is a required curriculum component, effective for students who began as freshmen at NDSU in the fall, 1996. The capstone experience, planned by the major department, is to be identified for the 1998-2000 Bulletin.

A capstone experience is typically defined as follows, "a culminating experience in which students are expected to integrate special studies with the major, and extend, critique, and apply knowledge gained in their major" (Wagenaar, 1993). It is viewed as a "final, mastery experience" (Davis, 1993). It focuses on the "ways of knowing" in the discipline and addresses the types of questions and issues faced by the discipline.

The usual reasons for the requirement of a capstone experience include adding a sense of coherence to the college experience (Carlson & Peterson, 1993). The capstone experience assists in addressing the "piecemeal approach" to the undergraduate program (Julian, 1993), and provides a sense of closure and connection between courses.

Purposes

Wagenaar (1993) has identified the following purposes for the capstone experience.

1. Integrating and synthesizing the field
2. Extending the field
3. Critiquing the field
4. Applying the field
5. Addressing issues raised in the introductory course, but at a higher level
6. Exploring key arguments in the field
7. Making connections with general education
8. Specific comparisons with other fields
9. Critically thinking generically and within the field
10. Examining values and views of life

Although the primary purpose of the capstone experience is to provide a sense of coherence to the undergraduate experience, this "synthesizing and integrating" can be conceptualized in a variety of ways. It could be to integrate and apply learning from general education with the major (Nichols, 1992). Or, to integrate subfields of the discipline (Morely, 1992). Or, to integrate the learning in the major with the expected professional roles of the graduate (Hartman, 1993). Or, to integrate the theoretical and the empirical (Davis, 1993), or the theoretical with methodological considerations (Smith, 1993). Or to integrate knowledge from various disciplines in light of complex ethical and social issues. Or, any combination of these purposes.

Regardless of the specific purposes selected by the department, the capstone experience focuses on the discipline from a holistic perspective, provides an in-depth exploration of issues, and integrates elements of the academic experience. In addressing important questions in the discipline, a range of answers is expected, with how to evaluate and verify those answers, and the place of the discipline among other disciplines is explored.

The capstone experience is also a turning point for the student, from education to professional practice. It is the transition from college to a professional career or graduate school.

Intended Outcomes

After the department has identified the purposes of its capstone experience, the expected or intended student outcomes are identified. These can be the same as the outcomes stated for the major (a wise idea) or those plus others.

The following are examples of intended outcomes that can be addressed in a capstone experience.

1. Write in a clear, organized, effective manner
2. Speak effectively and intelligently
3. Work constructively in groups, on teams
4. Make reasoned decisions
5. Use library effectively for research
6. Evaluate critically what read and heard
7. Understand theories and perspectives of the discipline
8. Demonstrate higher order thinking (critical thinking)
9. Use research skills

The capstone experience provides opportunities for multiple assessment of the intended outcomes.

Assessment of the Outcomes

Assessment of the outcomes begins with the intended outcomes of the major and general education. The capstone is a rich source of information on students' achievement levels in both skills and knowledge. It is an excellent place to gather student achievement data in relation to the overall intended program outcomes.

The assignments and activities in the capstone experience must be carefully designed to provide the opportunity for students to demonstrate their level of achievement of the outcomes.

One obvious product of a capstone can be an expanded paper. This permits demonstration of the students' skills in writing, critical thinking, knowledge of their discipline and its tradition, and understanding of the environment in which they live. Oral presentations can be required of this paper or of other tasks. Class participation can also be used to assess knowledge, critical thinking, and so forth. Ask from students their best thinking, clearest writing, greatest knowledge, and to address social and ethical issues.

This can come from group work, field work, or independent work. Real-world problems can be used very effectively (Blank, 1994). Students' self-directed learning can also be assessed. Questions can also be asked of the student, such as, did they learn to:

- make decisions
- articulate their knowledge to someone else
- manage a complicated process
- write technical reports.

In using the capstone activities for assessment, scoring protocols need to be created. Such techniques as primary trait analysis and secondary reading are effective. It is better to use from one to three faculty members other than the instructor of the capstone for this.

Typical criteria (possible primary traits) for assessing papers and critiques often include the following.

1. Organization and development of the thesis statement
2. Application of the theoretical/conceptual framework
3. Empirical support of the thesis
4. Bibliographic sources
5. Format and style of presentation
6. Grammar, spelling, and other "mechanics" of writing (Durel, 1993).

The same ideas can be adapted to oral presentations.

If students do not demonstrate the knowledge and skills we expect from graduates, then we need to know where they learned and where they failed to learn so we can make improvements.

References

Atchison, P. (1993, July). Creating the capstone connection. *Teaching Sociology*, 21(3), 226-228.

Blank, G. B. (1994, June). A capstone course and an evolution of outcomes assessment. Paper presented at the AAHE Ninth Annual Assessment and Quality Conference, Washington, DC.

This article reports on a capstone course in Forestry. The emphasis is on a real-world forestry problem which students address through field work, collaborative team work, and independent analysis resulting in both written papers and oral presentations. Examples of protocols are included.

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Durel, R. J. (1993, July). The capstone course: A rite of passage. *Teaching Sociology*, 21(3), 223-225.

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Examples are from capstone courses in mathematics, English, and political science.

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- Smith, W. L. (1993, July). The capstone course at Loras College. *Teaching Sociology*, 21(3), 250-252.
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- Tiemann, K. A. (1993, July). On making the center hold. *Teaching Sociology*, 21(3), 257-258.
- Troyer, R. J. (1993, July). Comments on the capstone course. *Teaching Sociology*, 21(3), 246-249.
- Wagenaar, T. C. (1993, July). The capstone course. *Teaching Sociology*, 21(3), 209-214.
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- Wattendorf, J. M. (1993, July). The sociology capstone course in a professional school. *Teaching Sociology*, 21(3), 229-232.
- Wolf, B. (1993). *Handbook on assessment strategies: Measures of student learning and program quality*. Bloomington: Indiana University, Office of the Vice Chancellor for Academic Affairs and Dean of Faculties. pp. 29-32.