ISSuES Program Assessment

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July 2010

The ISSuES program assessment plan combines several methods of analysis to gather data relating to learning outcomes and program effectiveness. A mixed methods approach increases the validity and reliability of program assessment by providing multiple measures of the student learning outcome data while also contributing valuable information about the efficiency of the program design. To address student learning outcomes, our program assessment combines rubric-style faculty assessment of writing samples and exit interviews. To address the efficiency of our program's design, we keep a longitudinal database that tracks each student's GPA throughout the program, course choices, focus cluster choices and data relating to application, matriculation and program status.

ISSuES Student Learning Outcomes

The program assessment literature stresses the importance of beginning the assessment process by choosing intended learning outcomes that fit the general goals of the program, while being both achievable and measureable (Kuk and Banning 2009, Moskal et al.. 2009). Both online and in our certificate proposal, ISSuES promises its graduates a plethora of potential student learning outcomes. First, we promise to provide engineering undergraduates with more coherent exposure to the social sciences and humanities by emphasizing the relationship between science, technology, engineering, and society. Second, consistent with the "Wisconsin Experience," this certificate aims to build cultural competency, civic engagement, and leadership skills. Third, ISSuES seeks to develop students' civic knowledge and ethical reasoning. Finally, we expect ISSuES students to enhance their capacity for critical thinking, written and oral communication, and problem solving.

These general goals have been developed into more concrete and measurable student learning outcomes. Put simply, we expect that students who graduate from the ISSuES certificate program will:

1) Be exposed to the social sciences and humanities;
2) Develop the capacity for interdisciplinary, critical thinking about the relationship between science, engineering and society;
3) Develop a sense of personal and social responsibility for their engineering practice;
4) Develop strong written communication skills.

Student Learning Outcomes Assessment

ISSuES student learning outcomes are measured in two different ways:

1. Exit Interviews
2. Assessment of Writing Samples

Exit Interviews

The exit interview has the following goals:

1) Encourage ISSuES students to reflect directly on their learning outcomes and how participation in ISSuES may impact their future engineering practice;
2) Provide ISSuES students with the opportunity to offer direct feedback about the program's design, efficiency and efficacy;
3) Give certificate advisors an overall impression of the student's learning outcomes;
4) Provide an opportunity for certificate advisors to encourage the ISSuES student to complete the Letter to My Major Advisor writing sample if s/he has not already done so.

The exit interview is meant to be a reflective and positive experience for the ISSuES student and the structure of the interview should be informal and the content variable. The Exit Interview Instructions offer the Certificate Advisor some basic guidelines for conducting these interviews as well as a space for recording their impressions (Appendix 1). Though the exit interviews are not required for program completion, students are strongly encouraged to participate. Certificate Advisors should make an effort to email and schedule these interviews with students who are completing the program.

Writing Samples

One method by which we will assess ISSuES student learning outcomes is through the comparing a writing sample produced by each ISSuES student at the end of the program with a writing sample produced at the beginning of the program. The two writing sample prompts, instructions and sample outlines have been designed to encourage to the student to reflect and write about topics related to the four learning outcomes. The ISSuES certificate currently requires one writing sample. The Letter of Interest (appendix 2) accompanies the Certificate Application Form and is a 1-2 page essay in response to the following prompt:

> The ISSuES Certificate Program is designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political environments?
> (If you are in the College of Engineering:) As an engineering student, how do expect broad knowledge of the social sciences and humanities to affect your engineering practice?

After completing the program, ISSuES are strongly encouraged (though not required) to draft another letter. This writing sample is a "Letter to My Major Advisor" and is a 1-2 page essay in response to the following prompt (appendix 3):

> The ISSuES Certificate Program was designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Now that you have completed the program, why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political environments? (If you are in the College of Engineering:) As an engineering student, how do expect broad knowledge of the social sciences and humanities to affect your engineering practice?

. To assess these two writing samples and compare the initial Letter of Interest and Letter to My Major Advisor, we created a rubric grading tool that uses each of the four ISSuES learning outcomes as evaluative criteria (appendix 4). Each writing sample will be scored for each of the four ISSuES learning outcomes following the instructions provided on the Writing Sample Comparison Coversheet (appendix 5). These scores will allow us to assess each of the four learning outcomes for individual students, compare ISSuES students to each other and allow for general program assessment.

Evidence suggests that when scorers receive adequate training in using rubrics, interrater reliability is high (Diller and Phelps 2008, Burgin and Hughes 2009). Brown and Glasner suggest that scorers can increase the reliability of their scoring by going through a small sample of portfolios separately, comparing scores and then scoring again (1998). Once we have a critical mass of students who have completed the program, we can begin address the reliability of the rubric. If each of us reviews and score a set of writing samples together, then grades her/his own subset of writing samples separately, we can be fairly confident that the scores will be consistent enough for program assessment. To further increase reliability, both writing samples will be scored for each individual after they have completed the program. The writing sample produced at the end of the program and the writing sample produced at the beginning of the program will be scored at the same time. In this way, we can ensure that both samples are being scored in the same way.

Program Efficiency Assessment

To determine whether our program design is meeting the needs of our engineering students in an efficient manner (not increasing time to graduation), we have a longitudinal database designed to track a variety of information relating to the student's participation in ISSuES and overall academic performance. Data collected for year-one largely relates to application and admission to the program and was collected from each student's application materials. Collected data included information about each ISSuES student's application and admission dates, chosen certificate advisor and chosen focus cluster. This data proved useful for tracking students through the application process and ensuring even distribution of certificate advisors.

As of the summer of 2010, this information is easily and conveniently stored in an excel file. However, as the program continues, the number of students will increase and we will expand the data collected to include what courses our students take, GPA tracking and program completion dates. It may be necessary to transfer the data to a more sophisticated data storage system. Also, an InfoAccess query will be necessary to periodically pull up all ISSuES student's transcripts and allow us to more efficiently collect GPA and course credit data. This information will be a useful tool for certificate advising and provide us with an overall picture of what focus

clusters and courses are most attractive to students, how the participation in ISSuES affects time to graduation and overall academic performance.

Each spring, an annual report will be created using the Annual Report Template (appendix 6) and information from the longitudinal database and any other assessments that are currently in process.

Suggestions for Future Assessment:

1) Create an InfoAccess query to pull up additional information about ISSuES students relating to GPA and courses taken.

2) Look into the feasibility of portfolio assessment. As detailed in the Program Assessment Memo created in the fall of 2009, our program's flexibility and focus on interdisciplinary reflection about the relationship between the social sciences, humanities and technology lends itself well to student process portfolios. While the collection, organization and storage of such materials would exceed staff time availability and resources of both the Holtz Center and the ISSuES students at the present, it may be more feasible as the program becomes more established.

Works Cited

Brown, S. and A. Glasner. 1999. "Assessment Matters in Higher Education: Choosing and Using Diverse Approaches." *Higher Education* 37(4).

Kuk, Linda and James Banning. 2009. "Student Affairs Preparation Programs: A Competency Based Approach to Assessment and Outcomes." *College Student Journal* 43(2):492-502.

Moskal, Patrick, Taylor Ellis and Thomas Keon. 2008. "Summary of Assessment in Higher Education and the Management of Student-Learning Data." *Academy of Management Learning & Education* 7(2):269-278.

ISSuES Program Assessment Timeline

Fall 2010	Advertise ISSuES with 2 information events with food. Coordinate around and advertise in InterEgr 102. Create InfoAccess Query to collect data for longitudinal database.
Spring 2011	Use Annual Report Template and longitudinal database to create report of previous academic year.
Fall 2011	Advertise ISSuES with 2 information events with food. Coordinate around and advertise in InterEgr 102.
Spring 2012	Use Annual Report Template and longitudinal database to create report of previous academic year.
Fall 2012	Advertise ISSuES with 2 information events with food. Coordinate around and advertise in InterEgr 102.
Spring 2013	By now, students should be completing the program. Pilot the exit interviews and adjust instructions/interview design accordingly. Review, score and test the validity of rubrics on a small subset of the Letter of Interest and Letter to My Advisor writing samples. Adjust the rubrics accordingly and score all of the samples for all the finished students. Use Annual Report Template and longitudinal database and the data from the writing samples to create report of previous academic year and first class of ISSuES graduates.
Fall 2013	Using the Annual Report, assess the program and make changes as necessary. Advertise ISSuES with 2 information events with food. Coordinate around and advertise in InterEgr 102.
Spring 2014	Conduct exit interviews. Score writing samples for completing students. Use Annual Report Template and longitudinal database and the data from the writing samples to create report of previous academic year and new ISSuES graduates.

Appendix 1[1]

Exit Interview Instructions

Integrated Studies in Science, Engineering, and Society

Student Name:_____ ID #:_____

Degree/Major:_____

Certificate Advisor:_____ Date ISSuES Program Completed_____

Instructions

The exit interview has the following goals:

1) Encourage ISSuES students to reflect directly on their learning outcomes and how participation in ISSuES may impact their future engineering practice.
2) Provide ISSuES students with the opportunity to offer direct feedback about the program's design, efficiency and efficacy.
3) Give certificate advisors an overall impression of the student's learning outcomes.
4) Provide an opportunity for the certificate advisors to encourage the ISSuES student to complete the Letter to My Major Advisor writing sample if they have not already done so.

The exit interview is meant to be a reflective and positive experience for the ISSuES student and the structure of the interview should be informal and the content variable. The questions below are suggestions and are not comprehensive or in any specific order. Feel free to use any amount or combination of these questions to get start a conversation going that addresses the topics listed about.

Please use the space provided below to record your overall impressions of the ISSuES student and their experiences in the ISSuES program including any suggestions they may have.

1

Suggested Questions

1) What was your focus cluster? How do you believe the courses you completed fit into the overall theme of your focus cluster?
2) How helpful did you find your certificate advisor?
3) How much do you believe your ISSuES courses contributed to your engineering practice?
4) How do you think participation in ISSuES has affected the way you think about your role as an engineer?
5) For engineering students: How do you think participation ISSueS has affected your progression through the engineering program?
6) What do you think is the most important message you have taken away from participating in ISSuES?
7) For engineering students: Would you recommend ISSuES to a freshman in COE? Why or why not?
8) If you could change one thing about the ISSuES undergraduate certificate, what would it be?
9) What was the most interesting/memorable/useful course you took as part of your ISSuES curriculum? Why?
10) What was the least interesting/memorable/useful course you took as part of your ISSuES curriculum? Why?
11) How do you believe participation in the ISSuES program will affect your future practice in the work world?
12) As you enter the job market, do you plan to inform prospective employers of your participation in ISSuES? Why or Why not?
13) We expect that students who graduate from the ISSuES certificate program have a number of objectives. Could you speak a little about each of these and whether or not you believe you have experienced them?
    a. Exposure to the social sciences and humanities
    b. The capacity for interdisciplinary, critical thinking about the relationship between science, engineering and society.
    c. A sense of personal and social responsibility for their engineering practice.
    d. Strong written communication skills.

Appendix 2

Letter of Interest Form

Integrated Studies in Science, Engineering, and Society
Letter of Interest Form

Student Name:_____ ID #:_____

Degree/Major:_____

Certificate Advisor Consulted:_____ Date Consulted_____

Which focus area do you intend to complete?

- o Ethics
- o Design
- o Leadership
- o Unsure
- o General_____ (specify focus)

Letter of Interest

Please attach a 1-2 page (single spaced) **Letter of Interest**. This short essay should be in response to the following prompt. A sample outline is provided on the second page of this **Letter of Interest Form.**

Prompt: The ISSuES Certificate Program is designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political environments?

If you are an engineering student, please answer the following question **in addition** to the prompt above.

As an engineering student, how do expect broad knowledge of the social sciences and humanities to affect your engineering practice?

Please also attach an up-to-date DARS report.

OFFICE USE ONLY:

RECEIVED BY:_____ DATE SUBMITTED_____

APPROVED BY:_____ DATE APPROVED: _____

Sample Outline for Letter of Interest

Your Letter of Interest should be clear, concise, and complete in sentence structure. It should have a clear and concise thesis supported by evidence. The letter should only be 1 to 2 pages long (single spaced), so you need to be concise. Before you submit your Letter of Interest to the Holtz center, you should ask a faculty member or fellow student to proofread your work.

> **Prompt:** The ISSuES Certificate Program is designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political contexts?
>
> If you are an engineering student, please answer the following question **in addition** to the prompt above.
>
> As an engineering student, how do expect broad knowledge of the social sciences and humanities to affect your engineering practice?

Opening Paragraph: Here you want to introduce yourself and give your general reasons for pursuing the ISSuES certificate. If you are especially interested in a specific focus, here is the place to declare that interest and explain why.

Body: In this section, you should answer the prompt and explain why you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political contexts.

Your ideas should be clear and supported with evidence. This evidence can be relevant knowledge from past courses or life experiences.

If you are engineering student, this is where you explain how you expect your engineering practices to be affected by broad knowledge of the social sciences and humanities. Again, your ideas should be clear and supported with evidence. This evidence can be relevant knowledge from past courses or life experiences.

Closing Paragraph: Finally, leave the Certificate Advisory Committee with a strong sense that you are qualified and will be successful in the ISSuES Certificate Program. In what ways have your past experiences prepared you for interdisciplinary work?

Appendix 3

Letter to Major Advisor Coversheet

Integrated Studies in Science, Engineering, and Society
Letter to Major Advisor Coversheet

Student Name:_____ ID #:_____

Degree/Major:_____

Certificate Advisor:_____ Date ISSuES Program Completed_____

Which focus area did you complete?

- o Ethics
- o Design
- o Leadership
- o General_____(specify focus)

Letter to Your Major Advisor

We at the Holtz Center for Science and Technology Studies are interested to hear about your experience in ISSuES. While completion

Please attach a 1-2 page (single spaced) **Letter to My Major Advisor**. This short essay should be in response to the following prompt. A sample outline is provided on the second page of this **Letter of Interest Form.**

Prompt: The ISSuES Certificate Program was designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Now that you have completed the program, why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political environments?

If you are an engineering student, please answer the following question **in addition** to the prompt above.

As an engineering student, how do you expect your broad knowledge of the social sciences and humanities to affect your future engineering practice?

Please also attach an up-to-date DARS report.

OFFICE USE ONLY:

RECIEVED BY:_____ DATE SUBMITTED_____

APPROVED BY:_____ DATE APPROVED: _____

Sample Outline for the Letter to My Major Advisor

Your Letter to My Major Advisor should be clear, well thought out and complete in sentence structure. It should have a clear thesis supported by evidence from your experience. The letter should only be 1-2 pages long (single spaced), so you need to be concise. Before you submit your Letter to My Major Advisor to the Holtz Center, you should ask a faculty member or fellow student to proofread your work.

> **Prompt:** The ISSuES Certificate Program was designed to help you gain broad knowledge of the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society. Now that you have completed the program, why do you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political environments?
>
> If you are an engineering student, please answer the following question **in addition** to the prompt above.
>
> As an engineering student, how do expect broad knowledge of the social sciences and humanities to affect your future engineering practice?

Opening Paragraph: Here you want to introduce yourself and give your general reasons for pursuing the ISSuES certificate.

Body: In this section, you should answer the prompt and explain why you believe it is important to understand how science and technology shapes (and is shaped by) social, cultural, economic and political contexts. Your goal here is to show us what you have learned from participating in ISSuES.

Your ideas should be clear and supported with evidence that references your participation in the ISSuES program. Evidence can include knowledge gained from your focus cluster courses, experiences in ISSuES program activities or knowledge from STS 201..

If you are engineering student, this is where you explain how you expect your engineering practices to be affected by broad knowledge of the social sciences and humanities. Again, your ideas should be clear and supported with evidence from your participation in ISSuES.

Closing Paragraph: Finally, leave the reader with a strong sense of how you plan to utilize what you have learned from participating in the ISSuES program.

Appendix 4
Writing Sample Comparison Coversheet & Rubrics

Integrated Studies in Science, Engineering, and Society

Student Name:_____
ID #:_____

Degree/Major:_____

Certificate Advisor:_____
Date ISSuES Program Completed_____

Focus Cluster Completed:_____

Please attach the student's Completed Course Contract and final academic transcript to this coversheet.

Instructions

We expect that students who graduate from the ISSuES certificate program will have:

5) Developed the capacity for interdisciplinary, critical thinking about the relationship between science, engineering and society.
6) Developed a sense of personal and social responsibility for their engineering practice.
7) Developed strong written communication skills.

Please use the attached rubrics to score the Letter of Interest and the Letter to My Advisor writing samples. The total score for each writing sample should fall between 3-9 points.

Writing Sample One: Letter of Interest

	Strong = 3 **Moderate = 2** **Marginal = 1**
Written communication skills Is the student able to write clearly and confidently about the relationship between science, technology and society? A strong essay will have a clear thesis appropriate to the assignment, supported by specific and relevant evidence, with logical paragraph structure. The language and style should be appropriate to the audience, with accurate spelling and grammar. A strong essay will convey knowledge of and interest in a range of disciplines.	
Capacity for interdisciplinary critical thinking about the relationship between science, engineering and society Does the student demonstrate understanding of the relationship between science, engineering and society? A strong essay will display an understanding of the ways in which engineering practice shapes and is shaped by cultural, political and social forces with evidence drawn from the knowledge and methods of multiple disciplines. The overall tenor of the essay will demonstrate the ability to both respect and critique a variety of disciplinary approaches.	
A sense of personal and social responsibility for their engineering practice Does the student's work reflect and awareness of the ways in which his/her own engineering practice is shaped by the relationship between science, engineering and society? A strong essay will display an understanding of the ways in which the student's engineering practice will shape and be shaped by cultural, political and social forces. Specific examples or arguments will demonstrate critical thinking regarding the ethics of engineering, particularly as it relates to the student's own practice.	
Total Score	

Writing Sample Two: Letter to My Advisor

	Strong = 3 **Moderate = 2** **Marginal = 1**
Written communication skills Is the student able to write clearly and confidently about the relationship between science, technology and society? A strong essay will have a clear thesis appropriate to the assignment, supported by specific and relevant evidence, with logical paragraph structure. The language and style should be appropriate to the audience, with accurate spelling and grammar. A strong essay will convey knowledge of and interest in a range of disciplines.	
Capacity for interdisciplinary critical thinking about the relationship between science, engineering and society Does the student demonstrate understanding of the relationship between science, engineering and society? A strong essay will display an understanding of the ways in which engineering practice shapes and is shaped by cultural, political and social forces with evidence drawn from the knowledge and methods of multiple disciplines. The overall tenor of the essay will demonstrate the ability to both respect and critique a variety of disciplinary approaches.	
A sense of personal and social responsibility for their engineering practice Does the student's work reflect and awareness of the ways in which his/her own engineering practice is shaped by the relationship between science, engineering and society? A strong essay will display an understanding of the ways in which the student's engineering practice will shape and be shaped by cultural, political and social forces. Specific examples or arguments will demonstrate critical thinking regarding the ethics of engineering, particularly as it relates to the student's own practice.	
Total Score	

Interdisciplinary Studies in Science, Engineering and Society (ISSuES)

Annual Report 200x-20xx Academic Year

The mission of the Integrated Studies in Science, Engineering and Society (ISSuES) Undergraduate Certificate is to offer undergraduate students an opportunity to interact with the social sciences and humanities in a way that emphasizes the relationship between science, technology, engineering and society.

HIGHLIGHTS OF THE YEAR (List roughly 5-7)

Events with students
Work done on ISSuES Website
Assessment Plan Moving Forward
Advertising Efforts
Participating in Campus Event
Sponsoring a Speaker
Etc.

Teaching and Learning

A brief paragraph here about notable events or accomplishments related to the ISSuES students and their learning, STS 201, or student learning outcomes.

Program Administration

List here events and accomplishments in the area of program administration.

Goals For Next Year

Briefly list the goals for ISSuES for the coming year. What did we learn this year and what can we change to better meet the needs of our students?

ISSuES Statistics

Provide statistics here related to admission, program completion, focus cluster distribution and certificate advisor distribution. As the program progresses, include information about the most popular departments for focus cluster courses, compare the current year to the last year and note any significant/interesting statistics.

ISSuES Program Participation for 2009-2010

New Applications	XX
New Admits	XX
Dropped this Year	XX
Total # of Current ISSuES Students	XX

Focus Cluster Distribution

Total # of Students in Design	XX
Total # of Students in Ethics	XX
Total # of Students in Leadership	XX
Total # of Students in General	XX
Total # of Undecided Students	XX

Certificate Advisor Distribution

Jeffrey Russell	XX
Daniel Kleinman	XX
Sarah Pfatteicher	XX