Following a process of consultation and debate, I am now prepared to recommend to Senate that the University incorporate the definition and assessment of learning outcomes as a component of curriculum development and quality assessment. The attached documents provide more details of what I am proposing, as well as some responses to questions that have been raised during discussion. These documents should be read in conjunction with material that has been submitted previously to SCUP and Senate – see SI 3.31 (February 2013).

I would like Senate to consider the following:

**Motion:**

That Senate approve the development and assessment of learning outcomes for all academic programs, based on a rationale, process and timeline set out in the attached documents.

encl.
Additional information

Sections A, B and C provide more detailed information about the proposed “rationale, process and timeline” referenced in the motion. Item D provides responses to issues raised by Senators during the discussion of S.13-31 at the February 2013 meeting. Appendices I through III respond to requests from various Senators for more concrete examples of definition of learning outcomes at the course and program level, and of ways in which programs would report to the VPA.

A. Rationale for defining and assessing learning outcomes

A1. Definition of learning outcomes provides clarity to intending and current students about the purpose of courses and programs. The assessment of student performance by instructors can be linked logically to the intended learning outcomes of a course and program, thus clarifying for students the instructor’s selection of the assessment processes and the grading practices.

A2. Definition of learning outcomes provides a framework for development and modification of curriculum and teaching methods. Discussion of learning outcomes can involve both faculty members and students, thus allowing faculty members to incorporate changing student interests into the curriculum. Faculty input will reflect emerging trends in the discipline, so that learning outcomes and curriculum can be modified as the discipline changes. Learning outcomes can be considered by external reviewers during the regular review cycle, and assessed for currency and relevance. Defining the learning outcomes of a course or program can influence the selection of teaching methods.

A3. Academic units can self-assess their performance in the delivery of courses and programs by examining the extent to which students have achieved the intended outcomes. The results of self-assessment can be used to modify the curriculum and teaching methods. Such assessments can be short-term (e.g. what percentage of students have achieved the desired outcome in a course), mid-term (e.g. has the department achieved its goal of creating certain kinds of learning opportunities for students; are students capable of integrating what they have learnt), or long-term (e.g. what are the career outcomes of students a decade after graduation).

A4. Reports on the extent to which learning outcomes have been achieved by students are evidence that an academic unit is capable of defining and assessing its educational goals, and that it responds to data about the results of its assessments. Together with the use of external reviews, this provides evidence that academic units are responsive to the needs of students and to the constructive critiques of external colleagues in the relevant academic discipline. Aggregation of these reports at the University level demonstrates that the institution values and requires accountability, while respecting the diversity of goals and teaching methods that reflect the variety of constituent disciplines and the expertise of individual faculty members.
B. Anticipated model for definition and assessment of learning outcomes

When fully implemented, the SFU outcomes and assessment process will have the following characteristics:

B1. All units identify learning outcomes at the course and program level, collect data on student performance that is relevant to learning outcomes, and use that data to modify the curriculum and teaching methods.

B2. There is a diversity of methods and processes employed; some units conform to requirements of a disciplinary or professional body; others have developed methods that are consistent with their discipline. Both qualitative and quantitative methods of assessment may be used. Although units choose how to implement this, a typical process would involve a cyclical structure of “continuous improvement”:

- The academic unit collectively defines program learning outcomes (see program examples in Appendix I)
- The academic unit identifies which outcomes should be assessed in which courses (see curriculum maps and matrices in Appendix I and course examples in Appendix II)
- Instructors identify which assessment processes (e.g. term paper, final exam, lab report) are most relevant to the outcome to be assessed in a particular course
- Individual instructors may use data to modify syllabus, teaching methods, assessment methods etc.
- Data about student performance are collected from course instructors; other data (e.g. from student or alumni surveys) are also compiled
- Curriculum committee evaluates data on a regular cycle and identifies need for modification
- Program outcomes and/or curriculum and/or course structure are modified
- A record of these activities is kept for reporting purposes (see reporting examples in Appendix III)

B3. Learning outcomes, assessment processes and their role in curriculum development are considered during external reviews by the disciplinary experts who form the review team. During the review cycle, units will report twice to the VP Academic on the processes they use and the impact that this has had on their activities (see reporting examples in Appendix III). This occurs as a component of the self-study document, and at the time of the mid-cycle report to SCUP on what has been achieved since the review.

B4. The VP Academic regularly compiles a report (from data collected during the external review cycle) that synthesizes the impact of assessing learning outcomes, and the VPA uses this as a component of the University’s accountability documentation.

B5. Support for the development or modification of learning outcomes and assessment processes comes from various units, such as the Teaching and Learning Centre, the Centre for Online and Distance Education, and Institutional Research and Planning. The University provides various options for software and IT support to assist in the collection and storage of data within the academic unit.
B6. Consideration of learning outcomes and assessment are integrated into current Senate committees, when appropriate. For example, when considering new programs or courses SCUS and SGSC examine proposed learning outcomes; SCUP considers external reviewers’ suggestions about curriculum and learning outcomes; SCUTL advises on the role of learning outcomes assessment in promoting high-quality teaching and learning, or in the development of effective course evaluations.

B7. Data from assessment of learning outcomes are used only to review and improve curriculum and to help select teaching methods.
C. Processes and timeline for implementation

C1. The development of program- and course-based learning outcomes will remain the responsibility of the academic unit and its faculty members. For most programs the implementation of learning outcomes will be tied to the external review cycle. This means that the process will be introduced gradually, allowing time to learn from experience and to modify the process if necessary. The VPA will provide a regular update to Senate on progress. If a program wishes to accelerate the adoption of learning outcomes, the VPA will try to ensure that resources are available to do so.

C2. Programs that have chosen to, or are required to, develop learning outcomes by external accreditation bodies will determine their own timing for implementation, based on their discipline’s accreditation timeline, rather than the external review cycle. Reports on assessment of learning outcomes will still be incorporated in external reviews of these units.

C3. With assistance and advice from support units, academic units will determine the way in which they will implement and assess learning outcomes. Academic units will control their internal governance processes for defining learning outcomes, developing assessment protocols, and determining how to collect and utilize data. Support units will provide advice about options, information about best practices etc.

C4. Institutional responsibility for development of learning outcomes and assessment lies with the VP Academic, who will designate a current senior staff person to organize the implementation and the development of a sustainable, cyclical process for implementing learning outcomes and assessment over a period of years. This person will also be responsible for developing a standard reporting mechanism, likely built on the Carnegie Mellon model (see Appendix III), whereby a narrative of the assessment of learning outcomes can be gathered and synthesized at the institutional level.

C4. There will be an advisory committee of faculty members, students and relevant professional staff during the implementation phase. This phase will last for a complete cycle of external reviews (approximately seven years). The committee will advise on methods of implementation, and monitor the impact on academic units. During the early stages of implementation, the committee will pay particular attention to concerns about workload and will advise the VPA if additional resources are required.

C5. Support for academic programs, the senior staff member in the VPA office, and the advisory committee will come from units such as the Teaching and Learning Centre, Centre for Online and Distance Education, IT Services, and Institutional Research and Planning. The VP Academic will provide funding to help academic units cover certain costs of development and implementation.
D. Clarifications and FAQs

The documents submitted to Senate by the VP Academic and discussed at the February 2013 Senate meeting provide a significant amount of information. The covering memo that accompanied the documents provided some further information about concerns that had been raised during the public discussion about the report of the Learning Outcomes and Assessment Working Group, and set an overall direction for what the University should achieve and how it could be achieved. Nevertheless, it was apparent during the discussion at Senate that there are some issues that require further clarification, and some questions that require answers. These are presented below.

D1 Issue: Use of the phrase “learning outcomes” implies a set of practices that is too narrow, and restricts learning only to what can be measured.

Response: As a number of Senators pointed out, we can state what we are trying to do in plain language: we want to define the aims and goals of our academic programs, and we want to assess in a variety of ways how well we are doing in relation to those intentions. I propose that we use the phrase “learning outcomes” in its broadest sense, that we acknowledge that not all outcomes can be measured easily, and that this is one of a number of methods that can be used to be accountable to our students, our colleagues, and external stakeholders.

D2 Issue: Not enough examples have been presented.

Response: The appendices include some examples of learning outcomes for courses and programs from other universities. The proposal for SFU is that each academic unit should define learning outcomes that are appropriate for the discipline, and for the faculty members and students in that unit. It is therefore not possible to specify the learning outcomes for any particular SFU unit – they will be determined locally, as will the assessment processes.

D3 Issue: The central administration of the University or another body, such as NWCCU, will impose learning outcomes or assessment methods or targets for compliance.

Response: This is incorrect. Senate is being asked to approve a process in which academic units define their own learning outcomes and the processes for assessing them. The VP Academic will report on the variety and diversity of approaches that are developed by academic units, as part of the general description of University accountability. NWCCU standards require only that learning outcomes are developed and communicated to students, and that evaluation of student performance in relation to intended outcomes take place.

D4 Issue: Academic units lack the resources and expertise to define and assess learning outcomes.

Response: Learning outcomes and assessment processes will be the responsibility of the instructor and the academic unit. The Teaching and Learning Centre already includes staff members who will be able to work with academic units to help them select the processes that work best for the unit. If necessary, temporary staff will be hired to work more closely with academic units, with appropriate local oversight.
(e.g. via the undergraduate curriculum committee). However, final decisions about the outcomes and processes for assessment will always be the responsibility of the academic unit.

**D5 Issue: Definition of learning outcomes creates unreasonable restrictions on faculty members.**

Response: Learning outcomes at both program and course levels should include expectations that are generally agreed by the members of an academic unit, and to this extent there is some restriction on the content of courses through a collegial process. I do not see this as any different from the current level of control of curriculum and course content at the unit level. However, it should be understood that the instructor retains control over pedagogy, and that each instructor may have their own goals that can be incorporated into a course in addition to the learning outcomes that have been more formally agreed.

**D6 Issue: Learning outcomes are too short-term. Faculty members, parents and students should be interested in the long-term impact of a university education.**

Response: It is not possible to measure all aspects of the benefits of a university education in the short term. However, that is not a good rationale for abandoning any attempt to ensure that some learning outcomes are being met successfully. Furthermore, there is no reason why an academic unit could not include evaluation of long-term pedagogy as part of its process. In fact, many units provide this information during external reviews, and other data are routinely gathered through alumni surveys. The advantage of assessing shorter-term learning outcomes is the opportunity for more immediate revision of curriculum or pedagogy to meet some of the learning needs of students in a more timely way.

**D7 Issue: The “audit” implications of measuring learning outcomes need to be explained, particularly as regards the autonomy of academic units.**

Response: The data on student performance in relation to learning outcomes should be retained within the academic unit. In order to demonstrate that the University is accountable, two reporting methods should be implemented. First, during the regular cycle of external reviews, the review team will be asked to comment on the unit’s learning outcomes, the extent to which the unit is achieving its goals, and recommendations for the future. Second, the unit will be asked to provide the VP Academic with a report on the definition and assessment of learning outcomes, using a reporting format similar to that developed by Carnegie Mellon (see examples in Appendix III). This report will include narratives about how the unit has used data to fine-tune its curriculum and delivery. Most of the “audit” function will be internal to the academic unit, whose members will decide for themselves what needs to be done.

**D8 Issue: The University community was not properly informed about the implications of applying for accreditation with NWCCU; the learning outcomes process is only being proposed in order to satisfy accreditation requirements.**

Response: The detailed list of occasions on which SFU’s application for accreditation has been discussed or reported can be accessed at

http://www.sfu.ca/content/dam/sfu/vpacademic/files/vp_academic_docs/pdfs/AccredTimelineSept2012.pdf
Initial discussions were held with the Board in 2008, and Senate was informed of the intention in November 2008. In January 2010, documents from NWCCU were distributed for comment to SFUFA, GSS, SFSS, SCUP and the Academic Operations Committee of the Board. Presentations were made to chairs and directors in March 2010 and to the VPA’s advisory committee on teaching and learning in April 2010. An update went to Senate and the Board in March 2011. A further report went to Senate in November 2011. Town hall meetings were held in March and April 2012, and the issue was discussed at meetings later in 2012 devoted to the 2013-18 academic plan and to the renewal of the VP Academic. In addition, reports have been featured in SFU News (including special supplements) and in The Peak.

However, it is perhaps more important to note that incorporation of learning outcomes and assessment into the planning and evaluation of academic programs is becoming more widespread in Canada. Ontario universities have already begun to move in this direction, as have universities in the Atlantic provinces. The BC provincial government has been working on a quality assurance process for BC post-secondary institutions for the past year, and a discussion paper is expected soon. With at least twenty years of experience in this field in post-secondary systems around the world, we are in a position to increase our accountability to stakeholders, while avoiding some of the mistakes that have been made in other jurisdictions.

A number of people have asked if failure to implement definition and assessment of learning outcomes will result in SFU no longer being able to pursue accreditation with NWCCU. Being clear about the goals of academic programs and developing ways to assess one’s performance in relation to those goals is central to accreditation, because it is central to the mission of any educational institution. I therefore think it would be very difficult to become accredited without incorporating assessment of learning outcomes as a component of our overall quality assurance processes. However, I want to be clear that I am recommending this because it will be beneficial to students, it will improve curriculum and focus attention on pedagogy, and it will add to the overall accountability of the University.

D9 Issue: Faculty workload will be increased by “busy work” that has little benefit.

Response: Academic units already spend a significant amount of time dealing with curriculum, as evidenced by the volume of material in front of Senate every month. Defining learning outcomes should allow a more focused discussion of curriculum, and is unlikely to increase the ongoing amount of work devoted to curricular issues. Instructors already assess student performance through a variety of methods. While there may be some work required to link the assessment processes more formally to course outcomes, most instructors could probably accomplish this with a few hours work. There will be some work required initially to develop learning outcomes at the program and course level; however, assistance will be provided to help units through this transition. There will be a requirement as part of the external review cycle to report on the assessment of learning outcomes; this should replace work that is involved in the preparation of self-study reports for external reviews.

D10 Issue: there is a critical literature about the value of learning outcomes

Response: as academics, we should not be surprised to find that a critical literature exists. We can take advantage of the literature to ensure that we do not repeat errors that have been made elsewhere.
Appendix I: examples of program-level learning outcomes and curriculum maps and matrices

- Kansas State University: Chemistry program outcomes
- University of Massachusetts Amherst: Psychology program outcomes
- University of Portland: Philosophy program outcomes

- Indiana University: History curriculum map
- California State University Chico: Economics curriculum matrix
- Kansas State University: Chemistry program alignment matrix
Chemistry Student Learning Outcomes

STUDENT LEARNING OUTCOMES
B.S., B.A. Chemistry Degree (ACS certified)

Graduates from the Chemistry degree program will have demonstrated:

- an understanding of major concepts, theoretical principles and experimental findings in chemistry.
- an ability to solve problems in an efficient and accurate manner.
- an ability to employ critical thinking and hypothesis-driven methods of scientific inquiry.
- a working knowledge of basic research methodologies, data analysis and interpretation.
- effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.
- the ability to use computers for chemical simulation and computation, data acquisition, and database usage.
- the ability to use instrumentation for chemical analysis and separation.
- a familiarity with, and application of local, state and federal safety and chemical hygiene regulations and practices.
- an appreciation of the importance and practice of good ethics.
- an ability to work effectively in teams in both classroom and laboratory.

K-State Undergraduate Student Learning Outcomes

- Knowledge. Students will demonstrate a depth of knowledge and apply the methods of inquiry in a discipline of their choosing, and they will demonstrate a breadth of knowledge across their choice of varied disciplines.
- Critical Thinking. Students will demonstrate the ability to access and interpret information, respond and adapt to changing situations, make complex decisions, solve problems, and evaluate actions.
- Communication. Students will demonstrate the ability to communicate clearly and effectively.
- Diversity. Students will demonstrate awareness and understanding of the skills necessary to live and work in a diverse world.
- Academic and Professional Integrity. Students will demonstrate awareness and understanding of the ethical standards of their academic discipline and/or profession.

Summary of the 2008-2009 Annual Progress Report on Assessment of Student Learning

The student learning outcomes that were assessed by the Chemistry Department for the academic year 2008-09 were, (i) an understanding of major concepts, theoretical principles and experimental findings in chemistry, (ii) an ability to solve problems in an efficient and accurate manner, and (iii) an ability to employ critical thinking and hypothesis-driven methods of scientific inquiry. After carefully reviewing the results from these learning outcomes, it was unanimously agreed by the chemistry faculty that the higher ACT-score prerequisite for enrollment in CHM 220 which was implemented in Fall 2008 worked very well and therefore will remain in place for Fall 2009. The assessment results also showed that problems arose for some students in CHM 210 due to inadequate preparation prior to taking the course and a chemistry placement exam may need to be implemented in the future. In 2009, our accrediting body praised the overall strength of our undergraduate program noting that we offer a strong core curriculum.

Download our Alignment Matrix here. (Acrobat Reader required)
Psychology Department Undergraduate Program Learning Objectives

The undergraduate curriculum for psychology majors has been designed to reflect the broad goals of enabling students to:

- Think scientifically about behavior and mental processes
- Use critical thinking skills
- Apply broad perspectives to behavior from both an individual and cultural point of view
- Pursue a variety of post-baccalaureate opportunities including employment, undergraduate school, and professional school.

To support these goals, the Department of Psychology adopted a well-articulated set of undergraduate learning outcomes in 2001. Although there are no national standards for the discipline, our goals and learning outcomes are consonant with those endorsed by the American Psychological Association in a 2002 report, "Undergraduate Psychology Major Learning Goals and Outcomes". The learning outcomes are outlined below:

**Conceptual skills:**

- Critically evaluate empirical support for various theories and findings
- Conduct literature searches using traditional and technology-based methodologies and critically evaluate and synthesize findings
- Understand the interconnections of psychology with other disciplines

**Research skills:**

- Use and evaluate research methods and designs
- Employ and evaluate basic statistics

**Applications skills:**

- Appreciate how psychological findings can be used to make informed judgments that strengthen the community and build public policy

**General skills:**

- Speak and write effectively in the discourse of the discipline
- Understand the diversity of behavior and experience
- Work effectively with others and on teams
- Synthesize natural science and social science aspects of psychology
- Understand the ethical practice of scientific inquiry
- Think scientifically, understanding the relationships between theories, observations, and conclusions
Philosophy: Learning Outcomes

The Philosophy Major is designed to provide the following learning goals and outcomes:

Outcome #1
Engage with significant philosophical problems.

Indicators of Achievement - Graduates will have the ability to:
- Explain why a philosophical problem is significant.
- Critically evaluate attempts to solve a problem.
- Engage and use primary philosophical texts in the context of addressing a philosophical problem.

Outcome #2
Engage in the art of dialogue.

Indicators of Achievement - Graduates will:
- Know how to identify and critically evaluate the presuppositions underlying their own questions and those of others.
- Demonstrate an ability to recognize views that oppose the ones for which they are arguing and to evaluate them in light of the positions they are holding.

Outcome #3
Write technically competent philosophical essays.

Indicators of Achievement - Graduates will have the ability to:
- Give a sustained and well-focused argument for their positions.
- Write papers demonstrating conceptual coherence.

Outcome #4
Integrate diverse views in developing their positions on an issue.

Indicators of Achievement - Graduates will have the ability to:
- Demonstrate an understanding of a diversity of philosophical positions/issues.
- Take a position with respect to some philosophical positions/issues.
- Place their positions in the context of various philosophical positions/issues in the history of philosophy.

Outcome #5
Demonstrate proficiency in the basic concepts of logic.

Indicators of Achievement - Graduates will have the ability to:
- Distinguish between arguments and non-arguments.
- Distinguish between deductive and inductive arguments.
- Evaluate arguments in terms of their soundness or cogency.
- Identify common formal and informal fallacies.
- Translate ordinary language statements into various systems of logic (e.g. categorical logic, propositional logic, and/or predicate logic).
- Use various systems of logic to check arguments for validity (e.g. the square of opposition, rules for categorical syllogisms, truth tables, natural deductions).

The Philosophy Major curriculum is intended to develop the skills embodied in these learning goals. The Capstone Project, completed in the senior year, is the primary means by which the Philosophy Department assesses whether students have met the first four of these learning goals. The exam at the end of the Logic course (PHL 421) is the primary means by which the Philosophy Department assesses whether students have met the fifth of these learning goals.
## Curriculum Overview

<table>
<thead>
<tr>
<th>Typical components of history course</th>
<th>100 Level [Comprehend/Recognize]</th>
<th>200 Level [Interpret/Apply]</th>
<th>300 Level [Explain/Evaluate]</th>
<th>400 Level [Create]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understanding the nature of the historical discipline and analysis</td>
<td>Learn the interpretive nature of the historical discipline</td>
<td>Illustrate how historians make interpretations of the past using primary and secondary sources</td>
<td>Appraise historical interpretations</td>
<td>Synthesize multiple historical interpretations</td>
</tr>
<tr>
<td>2. Dealing with evidence: Primary sources</td>
<td>Learn how to analyze/learn to question a primary source</td>
<td>Interpret the human agency within the context of how an artifact from the past was produced</td>
<td>Evaluate trustworthiness of sources and contrast diverse and conflicting primary sources</td>
<td>Develop relationships among multiple sources</td>
</tr>
<tr>
<td>3. Dealing with evidence: Secondary sources</td>
<td>Identify author’s arguments</td>
<td>Distinguish between an author’s main arguments and secondary points</td>
<td>Evaluate author’s argument and evidence</td>
<td>Synthesize issues in scholarly writings</td>
</tr>
<tr>
<td>4. Dealing with evidence: Textbooks</td>
<td>Summarize important themes and supporting details</td>
<td>Dissect the textbook and connect it to major course themes</td>
<td>Use the textbook to contextualize other scholarly writings</td>
<td>Textbook is used only to understand broader contextual issues, not as a source</td>
</tr>
<tr>
<td>5. Constructing and evaluating arguments</td>
<td>Recognize broad arguments</td>
<td>Produce arguments based on primary and secondary documents</td>
<td>Produce arguments based on evidence to address historical problems, imagine counter-arguments, and develop own voice</td>
<td>Develop an argument based on original research</td>
</tr>
<tr>
<td>6. Conducting historical research</td>
<td>Practice all other 100-level skills to prep for doing research</td>
<td>Practice all other 100-level skills to prep for doing research</td>
<td>Learn to find scholarly articles, books and primary sources</td>
<td>Select problem of study and find appropriate resources</td>
</tr>
<tr>
<td>7. Writing for history</td>
<td>Develop thesis statement supported by evidence</td>
<td>Further develop skill of producing clear arguments supported by evidence</td>
<td>Create an argument, marshal evidence and use endnotes, footnotes, and bibliography</td>
<td>Writing historically, employ appropriate use of a citation style</td>
</tr>
<tr>
<td>Student Learning Outcomes</td>
<td>Courses</td>
<td>Goal:</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>I = Introduce</td>
<td>P = Practice</td>
<td>C = Competency</td>
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<td>I</td>
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</table>

1. Be able to apply the market model to explain and predict price changes and economic behavior in individual markets.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>101, 102, 103, 301, 330, 335, 340, 253/333/355, 360, 365, 370, 375, 410, 435, 440, 450, 462, 465, 466, 470</td>
<td>I P C</td>
</tr>
</tbody>
</table>

2. Be able to identify and assess the opportunity costs involved in any economic activity, whether the decision-maker is in a household, a business firm, or a social organization.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
</tr>
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</table>

3. Be able to apply mainstream macroeconomic theory to explain and predict events in the aggregate economy, including roles played by fiscal and monetary policies.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>101, 102, 103, 301, 302, 330, 370, 375, 376, 410, 431, 470, 483</td>
<td>I P C</td>
</tr>
</tbody>
</table>

4. Be able to identify economic issues and problems, gather data needed to evaluate them, and analyze the data to gain insights into economic behavior and formulate possible solutions.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>301, 302, 335, 340, 352/333, 360, 365, 376, 389, 431, 435, 440, 450, 462, 465, 466, 470, 481, 482, 483</td>
<td>I P C</td>
</tr>
</tbody>
</table>

5. Acquire and develop an in-depth understanding of several specialized areas in economics, thereby learning how to apply microeconomic and macroeconomic theory to specific policy issues.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
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6. Be able to communicate with written and spoken word in the discipline of economics.

<table>
<thead>
<tr>
<th>Courses</th>
<th>Goal:</th>
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</thead>
<tbody>
<tr>
<td>Degree Program SLO's</td>
<td>CHM 200</td>
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<tr>
<td>----------------------</td>
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</tr>
<tr>
<td>1. an understanding of major concepts, theoretical principles and experimental findings in chemistry</td>
<td>X</td>
</tr>
<tr>
<td>2. an ability to solve problems in an efficient and accurate manner.</td>
<td>A</td>
</tr>
<tr>
<td>3. an ability to employ critical thinking and hypothesis-driven methods of scientific inquiry.</td>
<td>A</td>
</tr>
<tr>
<td>4. a working knowledge of basic research methodologies, data analysis and interpretation</td>
<td>A</td>
</tr>
<tr>
<td>5. effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.</td>
<td>A</td>
</tr>
<tr>
<td>6. the ability to use computers for chemical simulation and computation, data acquisition, and database usage.</td>
<td>A</td>
</tr>
<tr>
<td>7. the ability to use instrumentation for chemical analysis and separation</td>
<td>A</td>
</tr>
<tr>
<td>8. a familiarity with, and application of local, state and federal safety and chemical hygiene regulations and practices</td>
<td>A</td>
</tr>
<tr>
<td>9. an appreciation of the importance and practice of good ethics</td>
<td>X</td>
</tr>
<tr>
<td>10. an ability to work effectively in teams in both classroom and laboratory</td>
<td>A</td>
</tr>
</tbody>
</table>

University SLO's

| Knowledge | A | A | A | A | A | A | X | X | X | X | X | X | X | A | X | X | X | X |
| Critical Thinking | A | A | A | A | A | A | X | X | X | X | X | X | X | A | X | X | X | X |
| Communication | X | X | X | X | X | X | X | X | X | X | X | X | A | X | X | X | X | X |
| Diversity | X | X | X | X | X | X | X | X | X | X | X | X | A | X | X | X | X | X |
| Integrity | X | X | X | X | X | X | X | X | X | X | X | X | A | X | X | X | X |

"X" for courses in which students have the opportunity to learn the outcome. "A" for courses in which student performance is used for program level assessment of the outcome.
Appendix II: examples of course-level learning outcomes

- Portland State University CHEM 442 Quantum Mechanics
- University of Michigan PSYCH 270 Introduction to Psychopathology
- University of West Georgia PHIL 4150 Analytic Philosophy
Chemistry 442/552
Quantum Mechanics
Spring 2012
Syllabus

Dr Gwen Shusterman: 302 SB 2, 503-725-3897, shustermang@pdx.edu

Web page: web.pdx.edu/~shusteg – course D2L page link

Office Hours: Tuesday 10-11, Wednesday 10-11 and after class meetings. Open door policy.


Learning Objectives:

1. Students can give/write down at least one reason we need quantum mechanics as a tool/theory to understand chemistry.
2. Students are able to apply the concept of boundary conditions to generate solutions to the Schrodinger Equation and determine quantum numbers.
3. Students can use the approximation methods, Perturbation Theory and Variational Method, to calculate the energies and allowed states of a system.
4. Students can give a written description of the quantum origin of spectroscopy.
5. Students can deduce/determine structural information from spectroscopic data.
6. Students can effectively communicate scientific concepts to scientific and non-scientific audiences.
7. Students effectively and comfortably adopt various roles within the group structure, such as, manager, recorder or reporter.

Homework: Weekly problem assignments, unless otherwise announced, will be due on Wednesdays. Homework will be posted on the D2L page. Homework is due at class time. Late homework accepted through Friday for partial credit.

Simulations homework will also be posted on D2L. There will be worksheets posted and a very short quiz the day the assignment is due. Simulations will be assigned no more often that once a week and be due on Mondays. Some weeks there will be no simulation homework.

Computer software: The Mathcad program is available on the chemistry commons computers, SB 1 221. You can purchase a personal student copy through OIT for $20. This is a good tool for mathematically solving quantum problems, but not a requirement. I have set up a number of assignments that may be explored to further your understanding of key concepts. Only available for Windows.

For molecular modeling, Spartan software is available on the chemistry commons computers. This software is relatively expensive, but if you are interested in student software, you can look at the website: www.wavefun.com

Grades: Homework: 20%
In-Class participation: 15%
Midterm: 15%
Quizzes: 15%
Final: 35%
INTRODUCTION TO PSYCHOPATHOLOGY
(PSYCH 270)

Winter 2012
Time: W 4:00-6:00 pm + Discussion Section
Room: 1800 CHEM

Professors:
Patricia Deldin Ph.D.
Office: 2255 East Hall
Email: pjdeldin@umich.edu
Office hours: Th 1-2 or by apt.

Joseph Gone Ph.D.
Office: 2239 East Hall
Email: jgone@umich.edu
Office hours: Th 10:30-11:30 or by apt.

Nestor Lopez-Duran Ph.D.
Office: 2253 East Hall
Email: nestorL@umich.edu
Office hours: Wed 3-4 or by apt.

Course Description and Objectives

This survey course will introduce students to key issues in the contemporary scientific investigation of psychiatric disorders and psychological distress. The main objective of this course is to provide a scientific framework upon which students will learn about the causes, phenomenology, and treatment of the major psychiatric disorders.

In addition, students will learn to think critically about a number of contemporary issues, such as:
- How do we define and describe psychiatric disorders and psychological distress in a multicultural world?
- How do we integrate recent evidence on the causes of psychiatric disorders in ways that go beyond the traditional dichotomy of biology vs. the environment?
- How has the Diagnostic and Statistical Manual of Mental Disorders advanced and limited our understanding of psychiatric disorders?
- What does the evidence say about recent social/media controversies in our field (e.g., vaccines and autism, ADHD and medications, substance abuse and legalization, etc)?

This course will be divided into 3 sections and each section will be taught by a different professor (see schedule). Specifically, Dr. Gone will teach the first section from January 4th to February 1st, Dr. Deldin will teach from Feb 8th to March 14th, and Dr. Lopez-Duran will teach from March 21st to April 25th. Who should you contact? Feel free to contact your GSI for all questions regarding this course at any time. You can also contact Dr. Deldin, Dr. Gone, or Dr Lopez-Duran for questions regarding the course content that they are teaching. For example, you should contact Dr. Gone for questions about the content he will teach from Jan 4th until February 1st. Finally, Dr. Lopez-Duran is the course leader for all administrative issues. Please contact him for all non-content related questions.

Course Requirements

Expectations
- This course meets 4 hours each week, including a 2-hour lecture and a 2-hour discussion section.
- Attendance to the lecture is mandatory. In addition, a significant portion of the lecture material is not in the book. Therefore, it will be extremely difficult, if not impossible, to do well on this course if you don’t attend lectures every week and take careful notes.
- Attendance to section is also mandatory. Although some clarification of lecture content will happen in section, section will not be a substitute for lecture.
- To do well in this course, it is expected that students will attend all lectures and sections, take careful notes during lecture, do all assigned readings before each lecture, complete all homework assignments, and study intensively and strategically for all exams.

Books:
The textbook will be a primary resource for the course and will structure our exploration of abnormal psychology. All reading assignments will come from the required texts:
If you know that you will need to miss class on a day on which a test is scheduled (for example, due to a UWG sponsored event), you must let me know about your absence as far in advance as possible so that I can schedule another day and time for you to take the test (or a make-up test). If you miss a test without receiving my explicit permission beforehand and making arrangements for a make-up test, you will be permitted to take a make-up test if and only if one of the following conditions applies: (a) Your absence was due to illness or injury serious enough to require professional medical care and which prevented you from contacting me before the test; or (b) Your absence was due to other extenuating circumstances beyond your control. I will determine on a case-by-case basis what constitutes "extenuating circumstances beyond your control." You may be required to provide documentation pertaining to your absence before you are allowed to take a make-up test. Make-up tests will usually be longer and potentially more difficult than the original test that you missed.

Extra-credit work will not be given under any circumstances.

Attendance, Late Arrival, Early Departure

You may miss four class meetings with no effect on your grade. Beginning with your fifth absence, you will lose five points from your final average for every class meeting you miss. This policy applies to the first week of class, even for days on which you have not yet registered for the class. I will make exceptions for absences necessitated by UWG-sponsored events or other circumstances that were absolutely outside your control. However, I will make these exceptions only if ALL of your absences can be accounted for in one of these ways (e.g., if you miss five classes and you have documented, acceptable reasons for missing only four classes, then your fifth absence will still count against you). Attendance will be taken at the beginning of class. Make-up tests will usually be longer and potentially more difficult than the original test that you missed.

Extra-credit work will not be given under any circumstances.
Appendix III: examples of reports from academic units at Carnegie Mellon University, upon which the SFU reporting framework could be modeled

- Sample assessment chart
- Department of History
- Economics
- Social and Decisions Sciences
Carnegie Mellon University
Program-level Outcomes Assessment Chart

This form is intended to facilitate documentation of program-level outcomes assessment for accrediting agencies, advisory boards, and other internal or external audiences. For the purpose of following through on 2008 Self-Study recommendations, this information will be collected annually.

Date: Type Date Here

Name of Person Completing Form: Type Your Name Here

Dept/Program: Type Your Department/Program Name Here

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Direct Performance Measures</th>
<th>Indirect Performance Measures</th>
<th>Major Finding(s)</th>
<th>What Actions Resulted from Finding(s)?</th>
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</table>

Suggestion: It may be easier to work the chart from right to left, beginning with documenting recent changes to the program curriculum in the “Actions” column.

1Program outcomes identify the knowledge, skills, abilities, etc., that students should be able to demonstrate upon completion of the program. The outcomes need to be specific and measurable.

2Direct measures require students to demonstrate their knowledge, etc., for faculty to then assess whether/how well students are achieving/have achieved a program outcome. Examples of direct measures include artistic work products, case studies, exams, juried performances, oral presentations, papers, and portfolios.

3Indirect measures gather perceptions of whether/how well students are achieving/have achieved a program outcome. Examples of indirect measures include alumni, employer, and student surveys, exit and focus group interviews, enrollment and retention data, and job placement data. Indirect measures complement the data collected from direct measures and cannot stand alone as sole measures of student performance.

4Programs should identify the major findings after analyzing the data collected.

5Programs should provide evidence that the findings have been used to further develop and improve student achievement of program outcomes (i.e., actions that were taken as a result of data collection and analysis). It is also important to state when findings provide evidence that students are successfully achieving a program outcome.
# Carnegie Mellon University
## Program-level Outcomes Assessment Chart

This form is intended to facilitate documentation of program-level outcomes assessment for accrediting agencies, advisory boards, and other internal or external audiences. For the purpose of following through on 2008 Self-Study recommendations, this information will be collected annually.

**Date:** June 30, 2011  
**Name of Person Completing Form:** Joe W. Trotter, Head  
**Dept/Program:** Department of History (B.A. in History, B.A. in Global Studies, and B.A./B.S. in Ethics, History, and Public Policy)

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Direct Performance Measures</th>
<th>Indirect Performance Measures</th>
<th>Major Finding(s)</th>
<th>What Actions Resulted from Finding(s)?</th>
</tr>
</thead>
</table>
| **I.** Be able to explain continuity and change over time and place, by gathering, organizing, and interpreting evidence from primary and/or secondary sources that are relevant to particular historical contexts and appropriate to particular disciplines and/or course methodologies | Timeline and diagram assignments  
Mapping exercises/map quizzes  
Long essay exams (in-class)  
Take-home exams  
Short answer/Identification exams  
Graded contributions to discussion  
Oral presentations (group or individual) | | | |
| **II.** Be able to read texts (including entire books, routinely) and other media critically, to analyze evidence, arguments, and competing interpretations, and to challenge assumptions and values that underlie claims about the past and its relation to the present. | Regular, extended readings (formerly known as “books”)  
Long essay exams (in-class)  
Take-home exams  
Required reading notes  
Journal responses | | | |

1. Program outcomes identify the knowledge, skills, abilities, etc., that students should be able to demonstrate upon completion of the program. The outcomes need to be specific and measurable.
2. Direct measures require students to demonstrate their knowledge, etc., for faculty to then assess whether/how well they are achieving/achieved a program outcome. They include artistic work products, case studies, exams, juried performances, oral presentations, papers, and portfolios.
3. Indirect measures gather perceptions of whether/how well students are achieving/have achieved a program outcome. They include alumni, employer, and student surveys, exit and focus group interviews, enrollment and retention data, and job placement data. Indirect measures complement the data collected from direct measures and cannot stand alone as sole measures of student performance.
4. Programs should identify the major findings after analyzing the data collected.
5. Programs should provide evidence that the findings have been used to further develop and improve student achievement of program outcomes (i.e., actions that were taken as a result of data collection and analysis). It is also important to state when findings provide evidence that students are successfully achieving a program outcome.

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Note for “Action” column: All three majors in the Department of History were newly implemented in fall 2009, less than two years ago. So far, only 5 students have graduated with the new EHPP major, only 5 have graduated with the new Global Studies major, and none have yet completed the new B.A. in History. We will begin the “Actions” process to further refine our new majors during the 2011-2012 academic year.
<table>
<thead>
<tr>
<th>Program Outcomes¹</th>
<th>Direct Performance Measures²</th>
<th>Indirect Performance Measures³</th>
<th>Major Finding(s)⁴</th>
<th>What Actions Resulted from Finding(s)?⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response papers</td>
<td>Book reviews</td>
<td>Oral presentations (informational or interpretive)</td>
<td>History courses I took at Carnegie Mellon included critical reading; I was particularly interested in courses that included readings from multiple points of view.”</td>
<td>During the 2011-2012 year, the department’s Undergraduate Education Committee will explore ways to increase historiographical emphasis in existing courses for majors, as well as the possibility (within staffing constraints) of creating a new course.</td>
</tr>
<tr>
<td>Book reviews</td>
<td>Oral presentations (informational or interpretive)</td>
<td>Book/document content analyses</td>
<td>However, several students asked for more training in historiographical schools of thought and/or interpretive theories. Sample comment: “I would have liked to have learned more about the major critical and interpretive schools of thought.”</td>
<td></td>
</tr>
<tr>
<td>Oral presentations (informational or interpretive)</td>
<td>Film reviews</td>
<td>Student debates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book/document content analyses</td>
<td>Film reviews</td>
<td>Student debates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Film reviews</td>
<td>Small group discussions of primary sources</td>
<td>Small group discussions of primary sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student debates</td>
<td>Graded contributions to discussion</td>
<td>Graded contributions to discussion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**III. Be able to write analytical, historical arguments based upon the careful use of evidence, language, reasoning, and organization.**

| Direct Performance Measures² | Indirect Performance Measures³ | Major Finding(s)⁴ | What Actions Resulted from Finding(s)?⁵ |
| Long (5-10 pp.) analytical essays | Short (5-10 pp.) analytical essays | Long (20-30 pp.) research papers | At the 2011 annual Western Pennsylvania Regional Conference of Phi Alpha Theta (the history honor society), eleven (11) of our students competed by giving historical research papers. Eleven out of eleven ranked highly -- earning two “first place” and nine “second place” awards in different categories. |
| Long (20-30 pp.) research papers | Interpretations of visual evidence | Writing assignments to integrate primary and secondary sources | Personal exit interviews and/or questionnaires completed by 17 out of 25 graduating primary and additional majors in May 2011 indicated that the department-wide emphasis on writing is effective. Sample comments: “I have also learned a lot about writing history” “The program achieved both objectives [assembling sources and reading critically] well, while also helping me become a much better writer in the process.” |
| Interpretations of visual evidence | Oral presentations (persuasive) | Oral presentations (persuasive) | |
| Writing assignments to integrate primary and secondary sources | Oral presentations (persuasive) | Oral presentations (persuasive) | |
| Oral presentations (persuasive) | Oral presentations (persuasive) | Oral presentations (persuasive) | |

**IV. Be able to conduct historical, archival, or field research, independently and/or collaboratively, to integrate it with earlier scholars’ work, and to present findings in written and/or oral formats that acknowledge sources properly, fully, and fairly**

| Direct Performance Measures² | Indirect Performance Measures³ | Major Finding(s)⁴ | What Actions Resulted from Finding(s)?⁵ |
| Long (20-30 pp.) research papers | Ethnographic field notes | Ethnographic and/or oral history interviews | In 2010-2011, six (6) members of the History faculty advised twelve (12) students on research projects presented at the annual “Meeting of the Minds” event. |
| Ethnographic field notes | Interpretations of visual evidence | Oral presentations (group or individual) | Personal exit interviews and/or questionnaires completed by 17 out of 25 graduating primary and additional majors in May 2011 indicated that most students felt strongly prepared as researchers. Sample comment: “I feel so much better prepared than many of my peers in terms of in-depth research and analytical thinking” |
| Ethnographic and/or oral history interviews | Oral presentations (group or individual) | Graded contributions to discussion | |
| Interpretations of visual evidence | Oral presentations (group or individual) | Historical simulations or role playing exercises (based on research into different populations or points of view) | |
| Oral presentations (group or individual) | Historical simulations or role playing exercises (based on research into different populations or points of view) | Historical simulations or role playing exercises (based on research into different populations or points of view) | |
| V. Be able to employ the knowledge and skills gained by studying the past to understand contemporary issues, to challenge inaccurate or unsupported claims, to make careful comparisons across time, space, and culture, and to take informed positions as students at an international university and as global citizens. | Short and long essay assignments on the historical origins of contemporary issues | For 2009-2010, History ranked first among Humanities Departments for the number of primary majors who studied abroad [Source: Emily Half, Study Abroad Overview 2009-2010, 13 September 2010.] |
| | Breadth and depth requirements in all three curricula | |
| | Graded discussion leadership | |
| | Graded contributions to discussion | |

| VI. BA in History: Be able to articulate factual and contextual knowledge of specific places and times, to make careful comparisons (across time, space, and culture) and to discern how each generation (including theirs) uses the past for present purposes. | [Capstone assignments] Knowledge of national (beyond U.S.), regional, and global historical development | Two (2) History majors studied abroad in 2009-2010. |
| | Knowledge of the world before 1900 | The number of students in the "new" majors in the History Department grew from 44 in fall 2009, to 110 in May 2011. |
| | Research papers that integrate primary and secondary sources | The number of BA in History students grew from 7 in fall 2009, to 16 primary and 12 additional majors in spring 2011. |

| VI. BA in Global Studies: Be able to articulate complex understandings of the processes of globalization in the long- and short-term, by combining interdisciplinary, theoretical, and historical perspectives with cross-cultural knowledge and advanced language training. | Policy-oriented research projects | Seven (7) Global Studies majors studied abroad in 2009-2010. |
| | Written preparation and oral presentation of research proposals and preliminary results | The number of BA in Global Studies students grew from 11 in fall 2009, to 32 primary and 14 additional majors in spring 2011. |
| | Peer critiques of written and oral work | |

| VI. BA/BS in EHPP: Be able to persuade people to agree with their particular arguments and analyses; to conduct research under time and resource constraints; and to craft policies that address real world problems in a way that is sensitive both to history and competing sets of values. | Book/Film Analyses Topical Essays Normative Essays Debates, Mock Trials, and Legislative Hearings Issue Briefings Group Projects, particularly crafting recommendations for policy makers. | Seven (7) EHPP majors studied abroad in 2009-2010. |
| | | The number of BA/BS in EHPP students grew from 26 in fall 2009, to 33 primary and 3 additional majors in spring 2011. |
Carnegie Mellon University  
Program-level Outcomes Assessment Chart

This form is intended to facilitate reporting program outcomes assessment to accrediting agencies, advisory boards and other internal or external audiences. For the purpose of following through on 2008 Self-Study recommendations, this information will be collected annually.

Date: 7/11/2011  Program: Social and Decision Sciences  Name of Person Completing Form: John Miller and Connie Angermeier

<table>
<thead>
<tr>
<th>Program Outcomes 1</th>
<th>Direct Performance Measures 2</th>
<th>Indirect Performance Measures 3</th>
<th>Major Finding(s) 4</th>
<th>What Actions Resulted from Finding(s)? 5</th>
</tr>
</thead>
</table>
| 1. Students apply frontier tools from the social sciences, particularly microeconomics, to understand policy decisions and outcomes and to describe, predict, and influence social systems. | * Written exams  
* In-class individual presentations  
* In-class group presentations  
* Analytical essays  
* Homework based on assigned readings (both field-specific and current news)  
* Peer review  
* Review from graduate Teaching Assistants | * Preparing multiple drafts of essays  
* Senior and alumni surveys | * Some students have difficulty determining what is valid evidence in making arguments  
* Some students have more preparedness in economics than others  
* Some students need to change how they view economics – from traditional microeconomics to behavioral economics | * Provide opportunities to participate in interactive economic simulations  
* Extra opportunities for practice/study problems  
* Require analysis of published news articles to better apply concepts taught in class |
| 2. Students demonstrate how to write and speak about social science theories of individual and social behavior arising in economics, decision science, organizations, psychology, and political science, including results and debates. | * Written exams on theories and facts  
* Writing assignments based on assigned texts and articles  
* Preparing multiple drafts of essays  
* Individual and group presentations and class discussions  
* Analytical essays and | * Preparing multiple drafts of essays  
* Senior and alumni feedback/surveys | * Students often have difficulty sorting through contradictory findings about “facts”  
* Students are able to identify and solve problems, but the quality and appearance of the work is substandard | * Provide opportunities to help students become better consumers of empirical research  
* Provide opportunities to help students become better producers of empirical research  
* Provide opportunities for students to share and learn about ethics and diverse perspectives within the social sciences  
* Increased emphasis on communicating results – emphasis on total quality of work |

Submit completed form to the Provost's Office, WH 604, by Wednesday, June 30, 2010
3. Students solve/explore unstructured real-world problems that require teamwork and contributions from diverse disciplines.

- Term papers
  - Homework based on assigned readings with focused questions for analysis
  - Peer review
  - Review from graduate Teaching Assistants

- Design and conduct novel empirical research
- Analytical essays, term papers, and reports
- Preparing multiple drafts of essays and reports
- In-class discussions
- Individual and group presentations
- Homework based on assigned readings with focused questions for analysis
- Peer review
- Review from graduate Teaching Assistants

- Review from external advisory board
- Senior and alumni feedback/surveys

- Some students are weak in presentation skills to non-peers
- Students have some difficulty synthesizing multiple disciplines
- Analytical ability in writing exceeds that in speaking

- Require multiple drafts of written work to refine analytical abilities

4. Students demonstrate independent learning skills and enthusiasm for the field.

- Senior thesis work
- Projects for study abroad and internships
- Projects for individual student research

- Undergraduate, faculty, and alumni feedback/surveys
- Student reflective paper on experiential education (ex: “What

- In the SDS graduating class of 2010, approximately 26% of our students have experience abroad. Their projects/writings/presentations reflected their ability to be self-

- Refine advising procedures to promote study abroad, independent research, and internships
- Offer various outlets for students to discover research/experiential opportunities

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1 Data provided by the Study Abroad Office
Carnegie Mellon University
Program-level Outcomes Assessment Chart

This form is intended to facilitate documentation of program-level outcomes assessment for accrediting agencies, advisory boards, and other internal or external audiences. For the purpose of following through on 2008 Self-Study recommendations, this information will be collected annually.

Date: 6/30/2011  Name of Person Completing Form: Carol B. Goldburg

Dept/Program: Undergraduate Economics Program

<table>
<thead>
<tr>
<th>Program Outcomes</th>
<th>Direct Performance Measures</th>
<th>Indirect Performance Measures</th>
<th>Major Finding(s)</th>
<th>What Actions Resulted from Finding(s)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students should be able to identify, explain, and use economic concepts, theories, models, and data-analytic techniques.</td>
<td>In-class individual presentations</td>
<td>Successful Application to Graduate School</td>
<td>1) Most students can identify, explain, and use economic concepts, theories, models, and data-analytic techniques.</td>
<td>3) Introduce more current events/examples into the intermediate economic theory courses.</td>
</tr>
<tr>
<td></td>
<td>In-class group presentations</td>
<td>Employer Feedback</td>
<td>2) Some students are frustrated that they cannot jump immediately into elective courses after taking just Principles of Economics (73-100).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In-class quizzes/tests</td>
<td>Senior exit interviews</td>
<td>3) Some students want their intermediate theory courses to spend time going over current events.</td>
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<td>Research projects</td>
<td>1-3rd year end-of-year surveys</td>
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<td>Meeting of the Minds presentations and awards</td>
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<td></td>
<td>Discussions at Faculty Meetings</td>
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<tr>
<td>Students should acquire and use knowledge and skills of economics, mathematics, statistics, and computing flexibly in a variety of contexts, providing the foundation for success in graduate studies and careers in the public and private sectors.</td>
<td>Class discussions</td>
<td>Successful application to Graduate School</td>
<td>1) Some students find it difficult to transition form their theoretical training in statistics to econometric theory and applications.</td>
<td>1) Review curriculum of identified upper level electives to find ways in which data-analysis can be used effectively.</td>
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<tr>
<td></td>
<td>In-class individual presentations</td>
<td>Employer Feedback</td>
<td>2) While the faculty would like students to use economic/statistical data analysis programs (e.g., s-views, R, etc), many students prefer to use Excel because, apart from proprietary in-house data analysis packages, Excel is what many think they will use after their undergraduate degree program.</td>
<td>2) Help students to understand the value of distinguishing themselves via data-analytic skills that reach beyond the limited statistical capabilities of Excel.</td>
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<tr>
<td></td>
<td>In-class group presentations</td>
<td>Alumni Feedback</td>
<td>3) Few upper level electives require econometric analysis (beyond OLS)</td>
<td>3) Discuss at next Economics Curriculum Committee Meeting (Fall 2011)</td>
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<td>Discussions at Faculty Meetings</td>
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<tr>
<td>Program Outcomes</td>
<td>Direct Performance Measures</td>
<td>Indirect Performance Measures</td>
<td>Major Finding(s)</td>
<td>What Actions Resulted from Finding(s)?</td>
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</table>
| Students should be able to apply their economic tools to formulate positions on a broad range of social and economic problems and engage effectively in policy debates. | Class discussions  
In-class individual presentations  
In-class group presentations  
In-class quizzes/tests  
Research projects | Successful Application to Graduate School  
Employer Feedback  
Alumni Feedback  
Discussions at Faculty Meetings  
Discussions at Undergraduate Economics Program co-curricular events. | 1) Students are successful in applying their economic tools to economic problems.  
2) Some students have not been exposed to analytical frameworks that allow them to effectively engage in policy debates on topics where “the sanctity of life” and other intangibles must be quantified. | 2) Discuss at next Economics Curriculum Committee Meeting (Fall 2011) |
| Students should use investigative skills necessary for conducting original economic research and participating effectively in project teams. | Products Resulting From SURG Grants  
Senior Honors Theses  
Senior Project Course  
Peer Assessments of Teamwork (based on articulated criteria)  
Faculty Observations of Teamwork (based on articulated criteria) | Employer Feedback  
Alumni Feedback  
Discussions at Faculty Meetings  
CMU Community Feedback  
SURG Grants | 1) Most students work well in teams. The majority of difficulties that arise can be traced to either a) cultural differences and/or b) work-ethics.  
2) When self-selecting into groups, the determinants are: academic ability, friendships, and nationality.  
3) Many students have strong interests in pursuing research; however, they face the following barriers: a) identifying a faculty mentor, and/or b) setting up an individual research problem that can be accomplished in one-term or even two-terms, and/or c) having available summer funds so that they need not work elsewhere full-time.  
4) More structure is needed for the Senior Honors Thesis Program  
5) Some of the very top students choose not to write a Senior Honors Thesis. | 1) a) In some courses, faculty form groups and change group composition throughout the term.  
3) a) The introduction of the new Economics Colloquium course (73-450) should serve as a faculty research introduction to the students  
c) Dennis Epple and Carol Goldburg will be working with Deans Robert Dammon and John Lehoczky to identify ways to help finance more summer research opportunities.  
4) A new structure for the Senior Honors Thesis Program will be designed by the end of summer 2011. This will hopefully address point 5). | 2) Discuss at next Economics Curriculum Committee Meeting (Fall 2011) |
| Students should be able to deliver effective presentations in which they combine visual communication design with oral arguments and/or the written word. | In-class individual presentations  
In-class group presentations  
Brief Written Responses  
Written Essays  
Written Reports | Meeting of the Minds presentations and awards  
Alumni Feedback  
Discussions at Faculty Meetings  
CMU Community Feedback  
Employer Feedback | 1) Most students are strong public presenters with a keen sense of their audience, pacing, and the appropriate balance between the spoken and the graphic.  
2) Many students would benefit from increased writing opportunities. | 2) Discuss at next Economics Curriculum Committee Meeting (Fall 2011) |