

To: Mike Malone
Academic Cabinet
Date: 04/02/2009
Re: Quantitative Literacy Report and Proposal

The Quantitative Literacy Committee presents the attached proposal for quantitative literacy to the Academic Cabinet to review. The proposal consists of three sections:

- (1) Intended Learning Outcomes for Quantitative Literacy
- (2) Summary of Curriculum Development and Assessments for Quantitative Literacy
- (3) Saint Joseph's College Quantitative Literacy Graduation Requirement

The first presents a list of learning outcomes that represents the quantitative skills that the committee would like our Saint Joseph's College students to possess upon graduation.

The second presents a "CQI format" table that tracks the progress of quantitative literacy during the freshman through senior year with proposed assessment tools.

The third represents a curriculum proposal in a format similar to what might be placed in the college catalog. This proposes the creation of a quantitative requirement that must be completed by the sophomore year.

The committee has been working since October and this represents the members' recommendation. They spent considerable time researching current practices at other colleges and discussing approaches that would be feasible and appropriate for SJC. The committee has also continually solicited input from SJC faculty and continues to welcome that input.

We have not created a detailed syllabus for the proposed Quantitative Literacy course, nor have we created the implementation details for the development of quantitative literacy outlined the second document. That would be the work of the committee next year (2009-2010), provided it receives approval of the Cabinet, Provost, and faculty for this model. The planned implementation date would be fall of 2010.

Respectively submitted,
Karen Donnelly
Chair, Quantitative Literacy Committee

INTENDED LEARNING OUTCOMES FOR QUANTITATIVE LITERACY

March 12, 2009

As they approach graduation, Saint Joseph's College students will be able to demonstrate the following:

A. Proficiency with numbers, quantitative values and estimation.

Students can work with and draw sensible meaning from numerical values, such as units of measurement, conversions, rates of change, growth models, and proportions.

B. Data interpretation skills.

Students can accurately read and reason with data, as is often displayed in tables, charts, graphs, diagrams, and other visual formats.

C. Statistical interpretation skills.

Students can use basic statistical results and summaries to support or refute claims and to understand important trends, especially as these are used in current events, news, and policy debates.

D. Proficiency with basic financial data and tools.

Students can use quantitative measurements and analysis related to managing personal financial business and making personal financial decisions.

E. Probability reasoning skills.

Students can use basic probability concepts to assess risk and to evaluate uncertainty, as these issues relate to political policy, health care, financial, and other common decisions of citizenship.

F. Proficiency with technology used for quantitative thinking and analysis.

Students use calculators, spreadsheets, and other common applications as tools to address quantitative problems and questions.

G. Critical thinking and logical reasoning skills.

Students can understand and evaluate arguments, question assumptions, and think critically about historical and current events, especially as they involve quantitative analysis, in ways that help them become informed citizens. Quantitative literacy complements curriculum in Core and in the majors that aims to develop students into good critical thinkers.

SUMMARY OF CURRICULUM DEVELOPMENT AND ASSESSMENTS FOR QUANTITATIVE LITERACY

Program: <i>Quantitative Literacy</i>	Intended Learning Outcomes	Assessment Tools
<p>Freshman Year</p> <p><i>An initial screening process for incoming students consists of the benchmarks at right. Since no data currently ties these measures to later success meeting the [new] intended learning outcomes, we will continue to use these measures while collecting data for later assessment and review.</i></p>	<p>(i) <u>All entering students</u>: Demonstrate acceptable breadth and performance in high school-level mathematics.</p> <p>(ii) <u>Students not meeting benchmarks of (i)</u>: Demonstrate acceptable breadth and performance in high school-level mathematics.</p> <p>(iii) <u>Students not meeting screen (i) and (ii)</u>: Enroll in MTH 017 or MTH 093.</p>	<p>(i) Review of transcripts and standardized test scores. [Details in 2008-2009 Catalog, pg 16.]</p> <p>(ii) Evaluation of performance on SJC-administered math proficiency exam; must achieve 70% + to have MTH 017 or MTH 093 waived.</p> <p>(iii) Achieve a final score of 60%+ in MTH 017 or MTH 093.</p>
<p>Sophomore Year</p> <p><i>The details for how these outcomes will be achieved have not been determined, and this is the next step in the Quant Lit committee's work. However, we believe much of what appears in the next column should be addressed before the end of sophomore year.</i></p> <p><i>Examples of possible models include:</i></p> <ul style="list-style-type: none"> • <i>Requiring a new quantitative methods/literacy course of all students.</i> • <i>Requiring one of a selected list of existing quantitative methods courses.</i> • <i>A combination of the first two bullets above.</i> • <i>Integrating quantitative methods skills into the Core Curriculum.</i> 	<p>(A) Students can work with and draw sensible meaning from numerical values, such as units of measurement, conversions, rates of change, growth models, and proportions.</p> <p>(B) Students can accurately read and reason with data, as is often displayed in tables, charts, graphs, diagrams, and other visual formats.</p> <p>(C) Students can use basic statistical results and summaries to support or refute claims and to understand important trends, especially as these are used in current events, news, and policy debates.</p> <p>(D) Students can use quantitative measurements and analysis related to managing personal financial business and making personal financial decisions.</p> <p>(E) Students can use basic probability concepts to assess risk and to evaluate uncertainty, as these issues relate to political policy, health care, financial, and other common decisions of citizenship.</p> <p>(F) Students can use calculators, spreadsheets, and other common applications as tools to address quantitative problems and questions.</p>	<p><i>For illustration purposes only:</i></p> <p>(A) and (B) Rubric is used to evaluate a case study requiring quantitative analysis in order to make a recommendation for decision-making.</p> <p>(C) Application-based examination of statistical proficiency.</p> <p>(D) Rubric is used to evaluate three life-style oriented financial problems.</p> <p>(E) Application-based examination of probability proficiency.</p> <p>(F)...</p>

<p>Junior Year</p> <p><i>It is important to committee members that, whatever the model chosen for delivery of quantitative literacy material, follow up is needed in the junior year to reinforce application of at least some of the outcomes.</i></p> <p><i>This might be appropriate in Cores 5, 6 (or both), or in some majors courses.</i></p>	<p>(A) Students can work with and draw sensible meaning from numerical values, such as units of measurement, conversions, rates of change, growth models, and proportions.</p> <p>(B) Students can accurately read and reason with data, as is often displayed in tables, charts, graphs, diagrams, and other visual formats.</p> <p>(E) Students can use basic probability concepts to assess risk and to evaluate uncertainty, as these issues relate to political policy, health care, financial, and other common decisions of citizenship.</p>	<p><i>For illustration purposes only:</i></p> <p>(A) and (B) Rubric is used to evaluate a case study requiring quantitative analysis in order to</p> <p>(E) Rubric is used to evaluate a lab problem involving...</p>
<p>Senior Year</p> <p><i>A final assessment of whether, or how well, students have achieved the quantitative literacy outcomes should come in the senior year. Possible places for this are:</i></p> <ul style="list-style-type: none"> • <i>Core 10 research projects.</i> • <i>Test, project, problem, or other application in the major.</i> • <i>Independent quantitative literacy examination.</i> • <i>Some combination of above.</i> 	<p>(G) Students can understand and evaluate arguments, question assumptions, and think critically about historical and current events, especially as they involve quantitative analysis, in ways that help them become informed citizens.</p> <p><i>Any of the other outcomes could be evaluated again, too.</i></p>	<p><i>For illustration purposes only:</i></p> <p>(G) Rubric is used to evaluate use of quantitative reasoning used to support positions in Core 10 papers and presentations.</p>

Saint Joseph's College Quantitative Literacy Graduation Requirement

The College is committed to developing graduates who have the ability and “habit of mind” to use and evaluate quantitative information and apply it in their personal, professional, and public roles. To facilitate the development of the student’s quantitative habit of mind throughout the undergraduate years, a quantitative literacy course requirement must be completed by the end of the sophomore year.

Fulfilling the Requirement: Students can fulfill this requirement in one of the following ways:

- Completing QL101 Quantitative Literacy (See description below)
- Completing any of the following QL courses:

ECN 210	Statistics for Business and Economics
MTH 111	Math as a Human Pursuit
MTH 122	Discrete Mathematics
MTH 125	Calculus I (or AP credit)
MTH 342	Statistics
NUR 204	Statistical Analysis for Healthcare Providers
POL 225 / PSY 225 / SOC 225	Statistics

MTH QL 101 Quantitative Literacy 3 credits

This course covers the basic mathematical and technological tools used to analyze quantitative information through an emphasis on life-skills applications and analysis of current events. Topics include the interpretation of data, computation and estimation, logical reasoning, visual representation of data, statistical reasoning, basic probability, and financial concepts. Throughout the course, quantitative literacy skills will be used to interpret topics such as current events, public policy debates, news reports, personal financial decisions, and health care issues.

Prerequisite: Student has met the college’s Quantitative Literacy Entrance Requirement (see catalog)