Structuring Assessment for Accreditation by Professional Organizations

Moderator: **Gillian Pierce,** Director of Learning Assessment

Proficiency-Based Assessment: Semester 1 through 4 of Spanish Language

Alison Carberry, Lecturer of Spanish, CAS

Susan Griffin, Senior Lecturer of Spanish, CAS

Using Assessment Results to Inform Curricular Change: A Chemistry Department Approach

John Caradonna, Associate Professor of Chemistry, CAS

How Has Assessment Informed Curricula and Other Changes at CGS?

Megan Sullivan, Associate Dean for Faculty Research and Development; Associate Professor of Rhetoric; and Director of the Center for Interdisciplinary Teaching and Learning, CGS

BOSTON UNIVERSITY

Proficiency-Based Assessment: Semester 1 through 4 of Spanish Language

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BOSTON UNIVERSITY

Program Learning Outcomes Assessment at Boston University

Session 2

Closing the Loop: Using Assessment Results to Inform Curricular Change

A Chemistry Department Approach

John P. Caradonna
Department of Chemistry

Lawrence Ziegler, Chairman
John Snyder, Director of Undergraduate Studies
Linda Doerrer, Director of Graduate Studies

The Department of Chemistry offers a choice of three degree programs:

- **The Bachelor of Arts Degree in Chemistry [Options A (Intensive, ACS accredited) or B (without ACS certification)]**: intended for students who are primarily interested in careers as professional chemists or desire a fundamental grounding in chemistry in preparation for professional or graduate schools in chemistry and/or other disciplines where an understanding of chemistry is important.

- **The Bachelor of Arts Degree in Chemistry: Biochemistry**: intended for students who are interested in careers in biochemistry, the biological/biophysical sciences, medicine, pharmacology, and bioengineering.

- **The Bachelor of Arts Degree in Teaching Chemistry (SED)**: intended for students who are primarily interested in careers as chemistry teachers in secondary schools.

Student Learning Outcomes: Knowledge-Based

Each of our graduates will have:

- Mastered the critical knowledge at each level in the curriculum necessary to move on to the next level.
- Demonstrated the ability to use and apply appropriate concepts and quantitative methods in all sub-disciplines of chemistry (analytical, biological, inorganic, organic and physical chemistry, in both the classroom and the laboratory). Biochemistry concentration students will in addition have gained knowledge in cell biology, molecular biology, and biochemistry. Students in the Chemistry Education concentration, a program coordinated with the School of Education (SED) will have achieved certification for secondary education upon graduation.

Student Learning Outcomes: Knowledge-Based (cont.)

- The ability to integrate and apply a relevant body of knowledge to the evaluation of existing scientific studies, and to design studies to test specific hypotheses to address unsolved problems in the chemical and life sciences that benefit from expertise in chemistry.
- Learned how to use computers in data acquisition and processing and to utilize appropriate software as a tool in data analyses.
- Employed modern library search tools to locate and retrieve appropriate scientific information regarding a topic, technique, chemical, or other issue relating to the chemical sciences.

Student Learning Outcomes: Performance/Skills-Based

Each of our graduates will demonstrate the ability to:

- Effectively communicate both orally and in writing about the processes of the chemical sciences as the result of scientific inquiry.
- Utilize basic experimental techniques in all chemistry sub-disciplines through their laboratory experience.
- Operate research grade instrumentation, beginning in the teaching labs and continuing through the research experience, especially in nuclear magnetic resonance spectroscopy.
- Follow the ethical practice of research, experimental interpretation, presentation, and application of research in both the instructional and research labs through an ethics workshop.

Student Learning Outcomes: Affective

All graduates will be able to:

- Successfully pursue their post-graduate career objectives in professional and/or graduate schools, in a scientific career in industry, government, in a teaching career, or in a related career following graduation.

Assessment Measures – Department Assessment Subcommittee

Committee consists of UPC, PFF, and additional faculty/staff

- Analyze course and performance data
  - exams and lab reports
  - student evaluations
  - advising issues
  - feedback from Undergraduate Program Director
  - student oral and written research reports/ presentations in research labs
  - honors/senior research presentations
  - annual senior exit surveys with Chairman
  - collect information from external (alumni, industry, academic) bodies

Assessment Measures – Department Assessment Subcommittee

- Summarize its findings and present results to UPC and Department Chairman
- UPC presents to full faculty and moderates teaching lunch meetings of interested faculty designed to discuss issues and generate potential solutions
- Full faculty discuss options and charge UPC with developing curricular changes in consultation with appropriate cognate departments and CAS committees

Initial Assessment Target

- *The Undergraduate Policy Committee (UPC) has proposed, with the support of the faculty and chairman, to assess our introductory biochemistry course and lab (CAS CH421) to determine if we are meeting the goals and objectives established by the chemistry faculty teaching the course and the students enrolled in the course. This course is required for all versions of the chemistry major, hence our assessment will have a common influence to all of our advanced students.*

Biochemistry Course Offerings

- **CH/BI 421 (first of two terms; ≈ 175 students)**
  Introductory biochemistry. Protein structure and folding, enzyme mechanisms, kinetics, and allostery; nucleic acid structure; lipids and membrane structure; bioenergetics; vitamins and coenzymes; introduction to intermediary metabolism. (Prereq: CH101/102, **109/110**, **111/112**; CH203/204, **203/214**, **211/212**)

- **CH273 (one term; ≈ 195 students)**
  Biomolecules in aqueous systems. Composition, structure, and function of proteins, nucleic acids, and polysaccharides. Information transfer from DNA to RNA and proteins. Bioenergetic principles in glycolysis, oxidative energy metabolism, and selected biosynthetic paths. Applications to medicine, nutrition, and biotechnology. (Prereq: CH171, CH174 or CH101/102, CH203/204)

Assessing the role and success of CH421, Introductory Biochemistry

- **Initial selection based on**:
  - request of course instructors (past and current)
  - past student evaluations
  - graduating senior exit interviews

- **CH421 historically co-taught with BI421**
  - student population consists of CAS chemistry, BMB, neuroscience, psychology, and biology majors (including students interested in pre-medical, pre-dental, and pre-veterinary studies), Sargent College students, and College of Engineering students

Assessing the role and success of CH421, Introductory Biochemistry

- **Heterogeneous student population backgrounds**
  - in terms of familiarity and comfort with basic thermodynamics/bioenergetics, mechanistic organic chemistry, cell biology, genetics, biophysical methods, mathematical modeling, and bioinformatics
- Current 400-level course does not fully utilize earlier aspects of the undergraduate chemistry curriculum

Assessing the role and success of CH421, Introductory Biochemistry

- **Data collection**:
  - all students asked to complete a survey at start of course describing their backgrounds and their course expectations
  - will be compared with survey at end of course to see if course expectations were met
  - midterm surveys being used for more immediate feedback
  - student performance on common exams/ questions in CH421/BI421 will be examined
  - review of laboratory portion of course with correlation to past laboratory expectations regarding topics and depth of analysis
  - work with BMB faculty to address issues

Assessing the role and success of CH421, Introductory Biochemistry

- **Efforts should/will lead to**:

  - Development of a new curricular approach
  - Generate well-defined academic paths that match student objectives and areas of interest while maintaining overall foundation development
  - Enhance integration of course content with previous foundation coursework in major
  - Support cross-over interests of majors from other departments
  - Support continuation into CH/BI422
  - Serve as gateway course to advanced integrated courses in the chemical/biological area
  - Redistribution of students between CH/BI421 and CH273

How Has Assessment Informed Curricula and Other Changes at CGS?

Megan Sullivan, Associate Dean for Faculty Research and Development and Director of the Center for Interdisciplinary Teaching & Learning, College of General Studies

1. Allowed us to articulate what we all need

Students need

- a place to archive, organize and reflect upon their learning.
- an opportunity to showcase their best work in college and for jobs & internships.
- a chance to explore college, career and personal goals.

Faculty & College need

- to discover and measure how and what students are learning.
- to examine students' reflections and self assessments.
- to review students' individual and group work.
- to assess the impact of our courses and programs, including our advising program.

2. Provided the opportunity to use ePortfolios

All 1,100 students archive & create in their ePortfolios.

Students Archive

- assignments, papers, and interdisciplinary work for ALL CGS courses.
- capstone projects.
- reflections, questions, and research regarding courses, majors, internships & careers.

Faculty & Staff Assess

- student work in individual courses and across disciplines/teams.
- individual and group work for projects.
- whether students have the opportunity to engage in meaningful work with advisors.

3. Showed us what students can do

BOSTON UNIVERSITY College of General Studies

Team W: Nahomi Velasquez site ma

Home | Capstone 2013 | Humanities 202 | Natural Science 202 | Social Science 202 | Comparative Politics 357 | Humanities 201 | Natural Sciences 201 | Social Sciences 201 | American Politics 211 | Humanities 101 | Humanities 102: Interdisciplinary Connections | Rhetoric 102 | Rhetoric 101 | Social Science 102 | Social Science 101 | U.S. History 151 | Interdisciplinary Reflections | Advising

Home

Welcome to my E-Portfolio!

Hello everyone!

My name is Nahomi Velasquez, I am originally from Fresh Meadows, New York and am currently a sophomore at CGS. I am an aspiring political science major and with a minor in history. I chose to major in political science because I am especially interested in how our government operates and how those daily operations affect our fellow nations. However, my interests are not limited to that field of study; I also love physics because I love to know how the world works; everything from transmitting signals to landing a man on the moon! Last but not least, I also love sports and love to play sports, particulalry volleyball. I play volleyball for BU, Go Terriers!

Reading Entries past the midterm are located towards the bottom.

Reading Entries from 9/14/11 to 10/21/11 (Midterm)

9-14-11

The Iliad

Hector and Achilles as foils

Homer's *Iliad* may well be one of the best composed epic poems ever written in the sense that it is compromised of opposing characters who somehow hold similar attributes. For instance, both Achilles and Hector are great warriors, however they differ in their reasons for fighting this war. Achilles's main intention in fighting this war is based on the achievement of a solid reputation and the protection of manhood. In other words, Achilles fights to maintain his reputation of a great warrior and make a legacy for himself but he also fights for his woman prize, which Agamemnon has stolen from him, and so by association his manhood. By contrast, Hector fights this war in actuality to protect Troy and its citizens. In Hector's case, an entire city depends solely on his ability to defeat the Greeks. Hector's integrity is further highlighted in his conversation with his brother Paris, in which he urges him to fight the war he caused as well as when he stands alone outside the gates of Troy, ready to fight Achilles, and in part also ready to accept his fate.

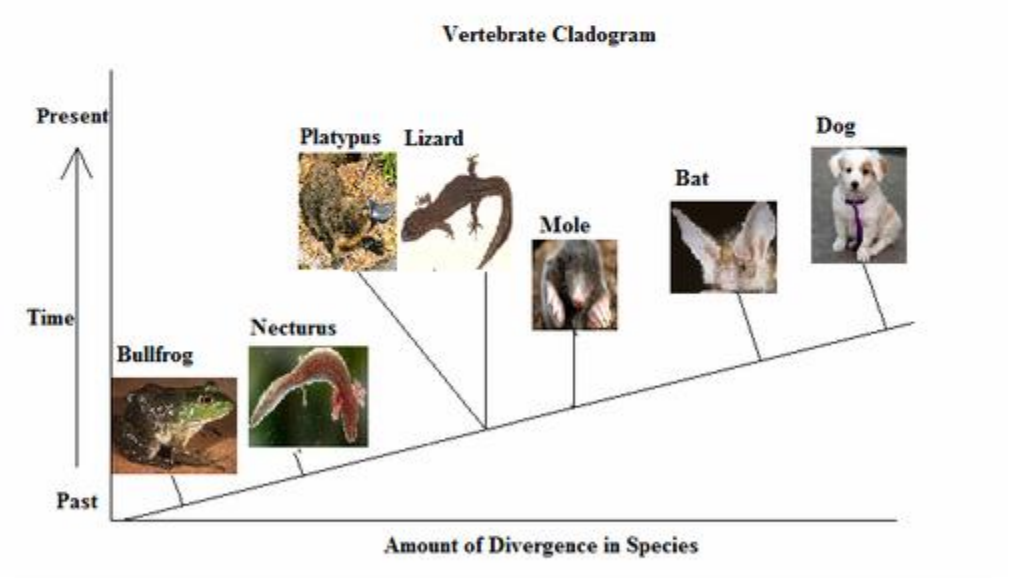
It is difficult to consider both Achilles and Hector as foils, but one can make a case that they are because of the different values they uphold. Although they are both great warriors, Achilles is very selfish as his primary concern is his legacy while Hector on the other hand prioritizes the citizens of Troy.

9-14-11

*The Kid A*s a Reflection of Chaplin's Life

Chaplin's The Kid is one of the best blends of comedy and sentimentality of all time; although it is very humorous and its main intention is to entertain, it also deals with serious underlying issues that occurred within early 19th century society. Chaplin's skill as a director, actor and producer is really showcased in the

Natural Sciences 201



This cladogram takes into account seven species and compares eleven bone structures in order to determine which species are most similar and most complex. The bone structures that were used as criteria are as follows, phalanges (both front and back), scapula, fibula, radius, humerus, mandible, coccyx vertebrae, lumbar vertebrae, cervical vertebrae and thoracic vertebrae.

The Bullfrog is the first animal because it is the animal that has the least in common with

Capstone 2013

Capstone Topic:
Containing Cholera In Haiti: Why It is Vital to U.S. Interests

Capstone Team 2013 (Team W): Adena Feitelson, Elizabeth Agneta, Nahomi Velasquez, Elizabeth Dean, Christine Francois, Caroline Wong and Filiz Yuzbasioglu

4. Made us work across disciplines to ask questions and articulate learning goals

- What should students know and be learning in their first two years of college?
- What kind of college – wide assessment rubric do we have; do students know this rubric; and do faculty across the disciplines assess student work similarly?
- How can we create the kind of assessment that informs faculty as they are teaching and after-the-fact?
- How can students become better at understanding what and how they have learned?

As a result of these questions, we created a rubric to assess ePortfolios across the disciplines; we created an assessment score sheet to be used in conjunction with the rubric and across the disciplines; and we charted progress.

CGS Assessment Rubric—Draft version

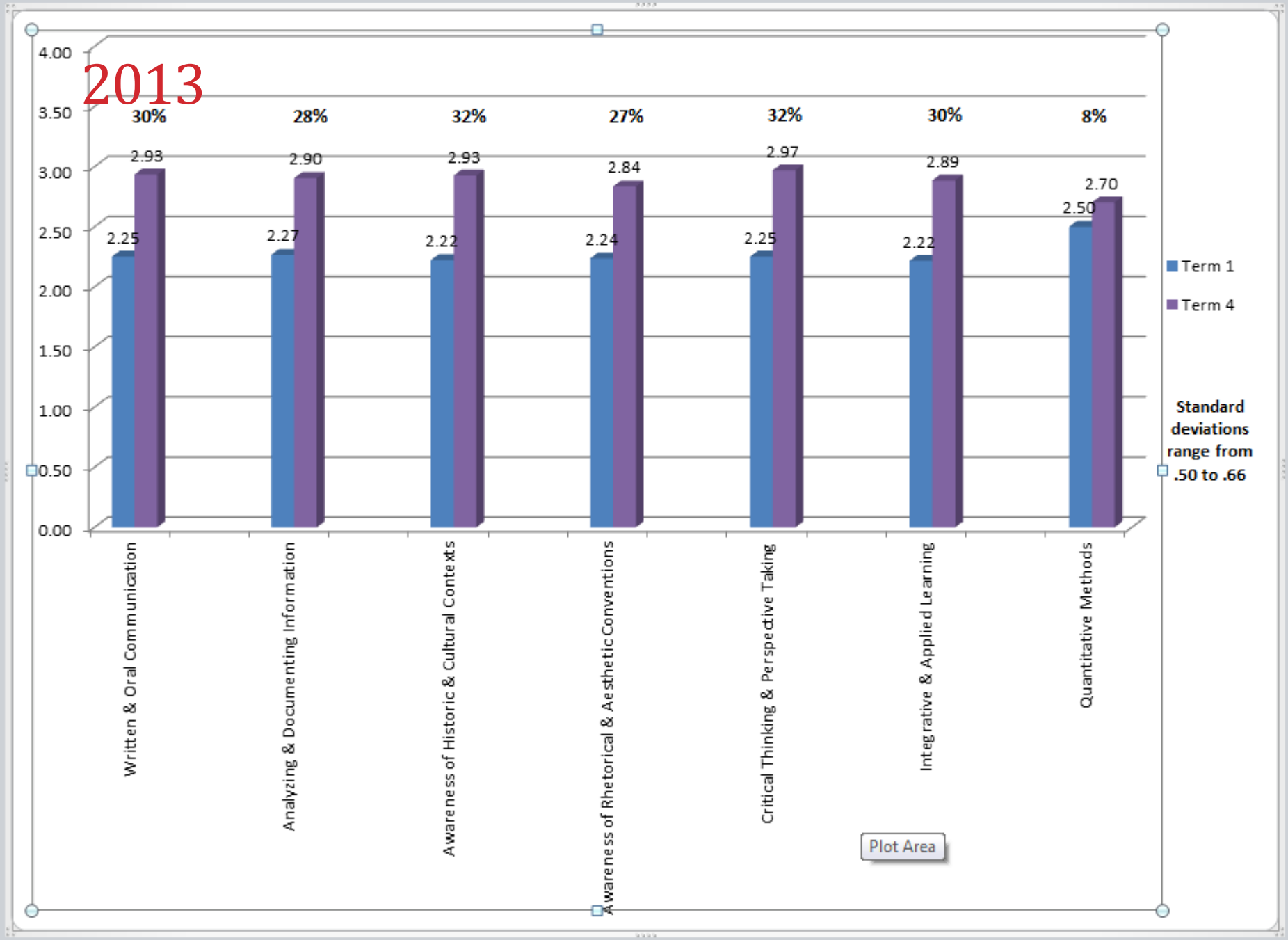
	level 4 excellent	level 3 competent	level 2 developing	level 1 no mastery
Written and oral communication	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (including organization, content, presentation, formatting, and stylistic choices); uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task; uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Follows expectations appropriate to a specific discipline and/or writing task for basic organization, content, and presentation; uses language that generally conveys meaning, although there may be problems with clarity and the writing may include some errors.	Attempts to use a consistent system for basic organization and presentation; uses language that sometimes impedes meaning or clarity. Contains errors in usage.
Gathering, analyzing, and documenting information	Synthesizes in-depth information from a range of high-quality, credible, relevant sources that are appropriate for the discipline and genre to develop ideas and documents these sources fully using MLA or Chicago style.	Consistently presents in-depth information from credible, relevant sources appropriate to the discipline and genre to support ideas. Documents sources with few errors or exceptions using MLA or Chicago style.	Demonstrates an attempt to use credible and/or relevant sources to support ideas and to document these sources properly using MLA or Chicago style.	Minimally attempts to use sources to support ideas in the writing; these sources may not be correctly documented using an acceptable style manual and/or may not be fully relevant to the task at hand.
Awareness of specific historical, literary, and cultural contexts	Uses appropriate, relevant, and compelling content and sufficient detail to illustrate mastery of the subject, including historical, literary, and cultural contexts.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline(s), but many not yet provide sufficient detail or illustrate mastery of historical, literary, and cultural contexts.	Uses appropriate and relevant content to develop and explore ideas through most of the work; does not display a consistently clear or adequately detailed understanding of historical, literary, and cultural contexts.	May use appropriate and relevant content to develop simple ideas in some parts of the work.
Rhetorical and aesthetic conventions	Demonstrates a thorough understanding of context, audience, purpose. Makes skillful rhetorical choices and shows deep appreciation for literary and aesthetic conventions and their effects.	Demonstrates adequate consideration of context, audience, and purpose. Understands rhetorical effects and shows appreciation for literary and aesthetic conventions and their effects.	Demonstrates some awareness of context, audience, and purpose. Can identify rhetorical strategies and shows some appreciation for literary and aesthetic techniques and conventions.	Demonstrates minimal attention to context, purpose, and audience. May not be aware of rhetorical effects of one's own work or of rhetorical strategies and literary techniques in works analyzed.
Critical Thinking and perspective-taking	Questions are examined from a range of viewpoints, taking into account the complexities of an issue. Conclusions and related outcomes are logical and reflect the student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Specific position takes into account the complexities of an issue and acknowledges other viewpoints. Conclusion is logically tied to a range of information.	Information is presented with some interpretation or evaluation, but not enough to develop a coherent analysis or synthesis. Acknowledges different sides of an issue, but may be more aware of others' assumptions than one's own (or vice versa).	Specific position is stated, but is simplistic and obvious. Conclusion is inconsistently tied to some of the information discussed. Information from sources is presented without interpretation or evaluation.
Integrative and applied learning	Makes insightful connections across disciplines and perspectives. Draws conclusions by combining examples, facts, theories or methodologies from more than one field of study to arrive at a sophisticated interdisciplinary understanding.	Makes connections across disciplines and perspectives by independently combining examples, facts, theories, or methodologies from more than one field of study.	When prompted, connects examples, facts, or theories across disciplines and perspectives. May not show a strong understanding of how methodologies differ across fields of study or could be applied in a new situation.	When prompted, presents examples, facts, or theories representing different disciplines and perspectives. Shows a limited interdisciplinary understanding.
Quantitative methods	Uses quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful and carefully-qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data for basic judgments, drawing plausible conclusions from this work.	Uses the quantiative analysis of data for tentative judgments; hesitates to draw conclusions from this work.

Assessment Score Sheet

(4-point scale, with 4 indicating highest level of achievement)

Student Name: _____ BU ID#_____

	Term 1	Term 2	Term 3	Term 4	+/- Change
Written & oral communication					
Analyzing & documenting data					
Awareness of historic & cultural contexts					
Awareness of rhetorical & aesthetic conventions					
Critical thinking & perspective taking					
Integrative and applied learning					
Quantitative methods					
TOTAL OF CHANGES:					


2013
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
30%
28%
32%
27%
32%
30%
8%
2.25
2.93
2.27
2.90
2.22
2.93
2.24
2.84
2.25
2.97
2.22
2.89
2.50
2.70
Written & Oral Communication
Analyzing & Documenting Information
Awareness of Historic & Cultural Contexts
Awareness of Rhetorical & Aesthetic Conventions
Critical Thinking & Perspective Taking
Integrative & Applied Learning
Quantitative Methods
Term 1
Term 4
Standard deviations range from .50 to .66
Plot Area

5. Uncovered what we need to do: one example of closing the loop

- By scoring ePortfolios against our rubric, our assessment committee found students need to learn more about quantitative analysis or quantitative reasoning.
- We informed entire faculty; we hired an expert to present a workshop on QR. Faculty read literature on how to incorporate QR.
- Faculty created a study group to create projects/papers across the disciplines that would allow students to practice QR.
- We have assigned projects and papers in QR and we will re-assess the results.