

2015-16 SAS Annual Assessment Report

Executive Summary

The School of Arts and Sciences 2015-16 assessment record is robust, as we would expect given SAS's success in establishing a strong culture of assessment and evidence-based undergraduate curriculum development. SAS emphasizes sustainable, efficient, and authentic assessments that provide valid practical information for decision-making about how to improve student learning and promotes a culture of evidence-based continuous improvement.

All of the 42 SAS departments and undergraduate programs¹ have aligned learning goals posted online and are actively engaged in regular direct assessment of student learning outcomes, or are working together as a faculty to develop and implement such plans. To date, **all 42** programs have filed their 2015-16 annual assessment reports. These are reviewed first in the SAS Office of Undergraduate Education and then audited by the faculty-based SAS Assessment Committee in the fall.

On the key criteria of developing effective, efficient, and sustainable assessment plans, half (**22/42**) of the reporting departments are using 'best practices' or are making 'very good' progress on all three of these measures. Eighty-three percent of the reporting departments (**35/42**) have developed and are using 'best practice' or 'very good' direct assessment tools. Most notably, all (**42/42**) of the reporting departments included descriptions of curricular and/or assessment improvements they have made, or will make, in light of what they have learned from their assessment results --- the key indicator of efficacious assessment practices.

In a handful of departments (**6/42**), however, the rate of progress clearly has slowed compared to past years. The reports for three departments indicate that no progress was made for AY 2015-16. The SAS Assessment Committee will review the reports for these departments in Fall 2016 and discuss ways to encourage them to reinvigorate their assessment efforts.

This year's reporting form asked departments what additional resources or services would help facilitate the assessment process. Several departments made requests for better data and technological tools to evaluate student experience in their programs. Other departments requested more training sessions and administrative support. The SAS Office of Undergraduate Education plans to work with the SAS Dean's Office and other units on campus to provide these resources and services. In sum, across SAS, assessment is being successfully used as an important tool in maintaining excellence in undergraduate education.

¹ Herein "department" refers to any department *or* program offering an undergraduate curriculum including Organizational Leadership which offers only a minor.

2015-16 SAS Annual Assessment Report

2015-16 SAS Annual Assessment Report

The overarching undergraduate education [vision](#) of the School of Arts and Sciences is to “offer a liberal arts education of the highest quality to a student body that uniquely combines academic excellence and social, economic, and cultural diversity.” In addition to the Core Curriculum goals,² our students will achieve:

- rigorous disciplinary learning goals in major and minor fields of study (or a single credit-intensive major field of study),
- an advanced level of achievement on those Core Curriculum learning goals of particular relevance to the individual student’s major, minor, and areas of elective interest.

The SAS faculty Assessment Committee, along with the SAS Dean’s office, oversees department-based assessment of disciplinary learning goals and advanced achievement of Core learning goals through the major.³ Throughout the year, the SAS Dean’s office assists departments in designing, implementing, interpreting, and improving their assessment efforts. Departments submit annual assessment reports by June 15th, using a [reporting form](#) that allows for the attachment of additional materials at the department’s discretion, and prompts for the following information:

- the learning goals for the major, minor, or course being assessed;
- the strategy or site for student achievement of the learning goal(s): e.g., major requirements, specific courses, internships where students actually demonstrate the learning outcomes;
- a description of least one direct measure of student learning outcomes for the goal(s), and the benchmarks (the minimum acceptable performance standards) for these;
- a summary of the results of the assessment; and
- any planned or implemented changes in light of the results, as well as a projected timeline for the follow-up re-assessment of student outcomes on the goal(s).

In AY 2014-15, the reporting form included an additional question on the most significant challenges faced in developing and implementing an assessment plan. This year, the reporting form was further modified to prompt for the following additional information:

- other course/curricula evaluations or reforms in which faculty are engaged;
- any additional data, resources and/or support services that would facilitate assessment efforts.

These annual departmental reports are reviewed in the Dean’s office and by the SAS Assessment Committee; this annual summary report is prepared for the SAS Executive Dean and the University’s Executive Council on Assessment (ECA). The SAS Assistant Dean for Assessment prepares drafts of individual reviews of each department’s assessment report noting “strengths of the plan,” “points of

² The Core Curriculum is addressed in a separate annual assessment report submitted to the Executive Council on Assessment, the Core Requirements Committee, and the Executive Dean of SAS.*

³ [Developing a Program Assessment Plan](#)

2015-16 SAS Annual Assessment Report

concern,” and “suggestions for moving forward.” The SAS Assessment Committee reviews these drafts and makes modifications as needed. These reviews are then returned to the departments. All SAS departments are actively engaged in regular direct assessment of student learning outcomes, or are working together as a faculty to develop and implement such plans. For the latter, the SAS Assessment Committee, with the assistance of the Assistant Dean, does mid-year follow-ups to ensure departments are moving forward and to provide assistance where desired.

The University’s Assessment Checklist for Academic Programs provides the basis for review of department reports. For all department reports, the Assistant Dean for Assessment does a preliminary scoring of each checklist along a scale from “best practices” to “progress slow or stalled.” Following the SAS Assessment Committee review in Fall 2012, this scoring rubric was slightly modified to clarify the intermediate ratings, and used in 2012-13 and 2013-14. In Fall 2014, the Assessment Committee further revised the ratings categories from 5 to 4 levels, and revised the category descriptions to emphasize the continuing progress of departments over time.

<i>Best Practices department</i>	<i>3.0</i>
<i>Very good progress</i>	<i>2.5</i>
<i>Making good progress</i>	<i>2.0</i>
<i>Progress is slow or stalled - mid-year progress report (to be) requested</i>	<i>1.5- 1.0</i>

In previous assessment cycles, programs were assigned overall evaluations that mapped directly into the scoring system. In Fall 2015, the SAS Assessment Committee decided to simplify the summative classification of program assessment efforts into three categories: “best practices,” “making reasonable progress,” and “progress slowed or stalled.” This simplification was motivated by a desire to provide more straightforward and useful feedback to departments. In particular, the Committee’s sense was that the distinctions in the rate of progress in the summative evaluation served to muddy the waters. For most departments, progress was uneven across the different measures. The Committee wanted to encourage departments to focus less on their overall “grade” and more on the feedback provided on the specific elements of their assessment plans and activities.

2015-16 SAS Annual Assessment Report

2015-16 Results:

42/42 reporting	Annual Report on Assessment ✓ Filed ✓ Comprehensive - includes a report on the various elements below as appropriate
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All of the 42 departments or major programs in SAS filed comprehensive assessment reports this year. These reporting programs plus the Writing Program (which is included in the Core Curriculum Report) account for 94.7% of the total enrollments in SAS courses for 2015-16 (202,554 out of (213,929)⁴.

Several departments filed their assessment reports well past the June 15th deadline. In many of these departments the delay was due in part to having a new undergraduate director who had not previously been engaged in the department's assessment efforts. The experiences of these departments highlight the need for program assessments to be carried out by a committee of faculty, not just the undergraduate director. The SAS Office of Undergraduate Education will be working with these departments to help them establish structures for program assessment that provide for continuity through departmental leadership changes.

Each of these assessment reports was reviewed and scored on each item listed on the ECA checklist. Assessment activities were scored on a 3-point scale from "best practices" to "progress slow or stalled" (See Appendix A). Chart 1 (p. 7) presents the SAS average score for all those departments scored on the item and Chart 2 (p. 8) presents the full results of this scoring. **In the ECA checklists, the SAS average score is given along with the number of departments scoring ≥ 2.5 over the number of departments reporting.**

3 42/42	Learning Goals ✓ Clearly defined ✓ Publicly posted – http://sas.rutgers.edu/component/docman/doc_download/532-sas-learning-goals ✓ Aligned in hierarchy of learning goals http://sas.rutgers.edu/component/docman/doc_download/532-sas-learning-goals ✓ University level ✓ Decanal Unit level ✓ Program/department level ✓ Course level
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⁴ The Writing Program registered 18,071 students in 2015-16 and its excellent assessment program feeds into the Core Curriculum report. The remaining 11,375 students are registered under SAS numbers for interdisciplinary courses and a range of one-credit seminars such as Byrnes, Students in Transition, and Honors Colloquia.

2015-16 SAS Annual Assessment Report

All SAS departments and programs have developed and published [programmatic learning goals](#) available on SAS and department web pages and in the [official catalog](#). As illustrated in Appendix B, department learning goals align with both university and Core learning goals, as well as meeting the SAS goal of rigorous disciplinary learning goals in major and minor fields of study (or a single credit-intensive major field of study).

2.8 37/42	Course Syllabi: syllabi/synopsis/expanded course descriptions
2.2 19/42	✓ Includes appropriate learning goals
	✓ Identifies where or how the goals are met

Overwhelmingly SAS syllabi include appropriate learning goals and syllabi or course synopses with learning goals are available to students before they register. Departments/programs vary in the extent to which they pursue specific program goals in particular targeted courses or whether program goals are achieved through an extended course of study involving multiple specific classes that students may mix in ways that fit their own specific needs. We expect that as departments find some of their benchmarks unmet they will target curricular points for student development of the skills and knowledge necessary to meet the particular goal.

2.4 25/42	Assessment Plan, Structure, and Process: Describes the assessment structure and the process by which the assessment plan was developed and shared within the unit
2.5 28/42	✓ Efficient
2.7 36/42	✓ Effective
3.0 42/42	✓ Sustainable
	✓ Reviewed annually

SAS departments continue to progress in developing strong assessment plans, structures, and processes. (For previous years' results compared to 2015-16, see Appendixes B and C.) Our annual reporting system insures that all departments review their plans each year. The SAS averages on the efficient, effective, and sustainable criteria ranged from 2.4 to 2.7 and more than half (**23**) of the departments scored ≥ 2.5 on all four measures. Only **7** reporting SAS departments scored below 2 ('making good progress') on any of the four criteria in this category. Of the **42** reporting departments, **14** scored 'best practices' on all four of these criteria: Africana Studies, Biological Sciences, Cell Biology and Neuroscience, Comparative Literature, Genetics, Geography, Italian, Linguistics,

2015-16 SAS Annual Assessment Report

Mathematics, Molecular Biology and Biochemistry, Organizational Leadership, Physics and Astronomy, Psychology, and Spanish and Portuguese.

	Assessment Tools/Measures
2.7 35/42	✓ Includes some direct measures
2.6 31/42	✓ Tools/measures appropriate to goals
2.5 30/42	✓ Designed to produce reliable results that can be used for program improvement

SAS departments have done well in in developing direct, appropriate, and reliable assessment tools and measures. SAS averages ranged from 2.5 to 2.7; 67% (28) of SAS departments/programs scored ≥ 2.5 , and 13 'best practices', on all three of these criteria.

	Benchmarks/Standards
2.3 23/42	✓ Describes the process used define standards, targets, and relevant peer and historical comparisons
2.4 26/42	✓ Articulates appropriately rigorous standards for judging student achievement of learning goals and identifies unacceptable levels of performance for all learning goals

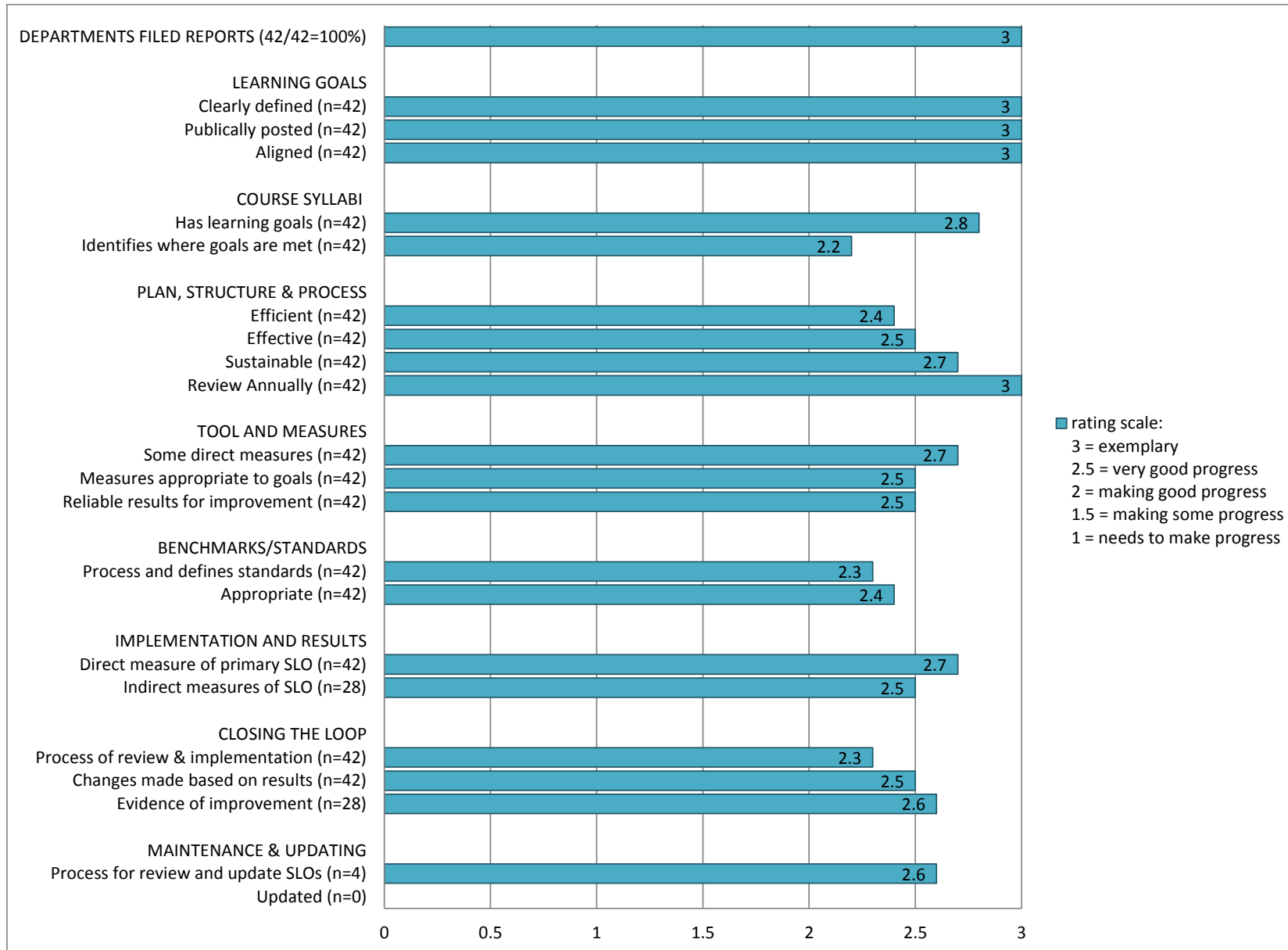
SAS departments employ benchmarks that incorporate rigorous standards for student achievement. Just over 20% (9/42) of all SAS departments/ programs scored 'exemplary' on both of these criteria in AY 2015-16.

	Assessment Implementation and Results
2.7 35/42	✓ Conducted and reports on at least one direct assessment measure of at least one of the primary student learning goals; results included in report

SAS Departments particularly excelled in conducting and reporting direct assessments of student learning outcomes. The SAS average on this was 2.7 and 35 of the departments scored ≥ 2.5 on the conduct and reporting of direct assessments. 32 SAS departments also conducted at least one optional indirect assessment of student learning, 18 of which earned a score ≥ 2.5 .

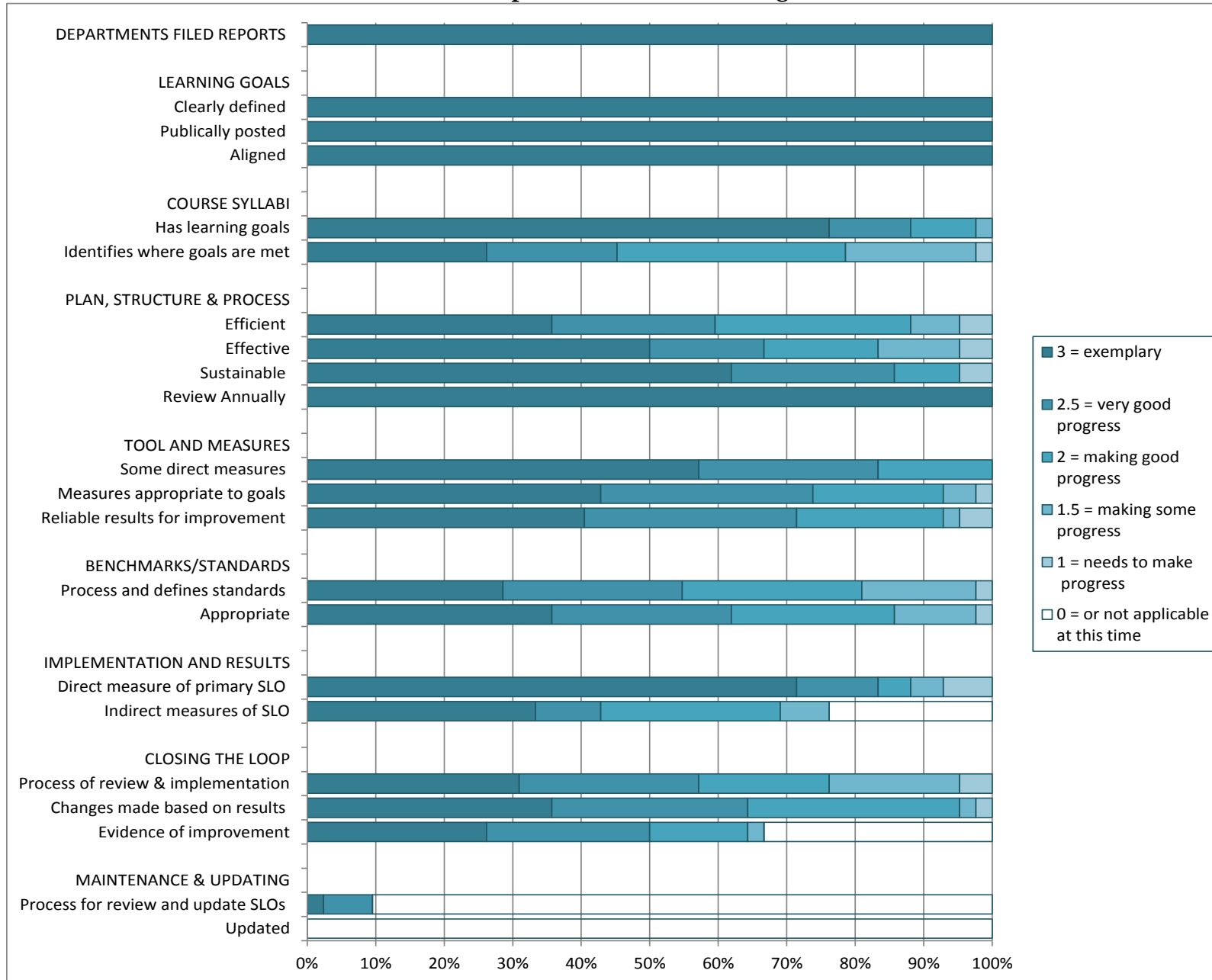
2015-16 SAS Annual Assessment Report

Chart 1: Average of SAS Department Scores, 2015-16



2015-16 SAS Annual Assessment Report

Chart 2: Percent of SAS Departments (n=42) Scoring at Each Level on Checklist Rubric, 2015-16



2015-16 SAS Annual Assessment Report

2.3 24/42	Response to Assessment Results: “Closing the Loop” activities ✓ Describes the process used to review assessment information and use for improvement
2.5 27/42	✓ Modification/refinement of pedagogy, curriculum, assessment tool, or learning goal based on assessment results.

All departments included information about the analysis and review of their assessment results this year, and over half (24) of all departments scored ≥ 2.5 on ‘closing the loop’ activities, indicating that there is clear and substantial progress being made on implementing evidence-based decision-making across SAS programs. In addition, all 42 departments included at least some detail in their reports about the planning and/or implementation of modifications to courses, curriculum, and/or assessment processes in an effort to improve their student learning outcomes and the reliability of their assessments. Some of the modifications, based on the most recent assessment results, have necessarily not yet been implemented.⁵

The real proof of successful assessment in SAS is apparent in the examples of positive changes departments are making based on what they have learned from their assessments. Appendix D lists the changes SAS departments have reported that they have made, or are planning to make, to improve student learning by addressing concerns revealed by their assessment data.

2.6 21/28	Response to Assessment Results: Post-“Closing the Loop” assessments ✓ Successful Improvement: Provides evidence of improved student learning based on implemented changes
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Many departments are still in the early stages of assessment and have not yet had the opportunity to implement and evaluate course or curricular changes prompted by prior assessment results. However, 28 departments reported evidence of improvements in student learning resulting from prior “close the loop” actions. Appendix E provides some examples of such reports from American Studies, Biological Sciences, Italian, Linguistics, Molecular Biology and Biochemistry, and Spanish and Portuguese.

⁵ A number of those actions included in Appendix D were not scored on “Modification/refinement of pedagogy, curriculum, assessment tool, or learning goal based on assessment results” in the ECA chart because they have not yet been implemented.

2015-16 SAS Annual Assessment Report

2.6 4/4 0 0/0	<p>Maintenance/Updating Process</p> <ul style="list-style-type: none"> ✓ Describe the process used to review and update learning goals ✓ Learning goals are updated, as needed, in light of changes in University, unit, or program mission and strategic plans, advances in disciplinary knowledge, evolution of stakeholder needs, and changes in student preparation and capacity
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Similarly, it is premature to expect many departments to have had occasion to update program learning goals. Like assessing the effect of changes made based on previous assessments, this is an area that the SAS Office of Undergraduate Education will continue to work on with departments as assessment matures in the School of Arts and Sciences. Even so, since 2009-10, 8 SAS departments have responded to their prior assessment results, changes in external disciplinary and/or professional standards, and the SAS Assessment Committee's recommendations for moving forward, to focus attention on the review and revision of their program learning goals: American Studies, Asian Languages & Cultures, Biological Sciences, Earth and Planetary Sciences, Latin American Studies, Latino & Hispanic Caribbean Studies, Molecular Biology & Biochemistry, and Political Science.

In assessment of student learning outcomes, **13** SAS departments have been designated as using "best practices" for 2015-16.

Africana Studies	Italian	Psychology
Biological Sciences	Linguistics	Spanish & Portuguese
Cell Biology & Neuroscience	Mathematics	
Criminal Justice	Molecular Biology &	
Genetics	Biochemistry	
Geography	Physics & Astronomy	

Many other programs took significant steps forward in their assessment efforts this year. A few programs have farther to go, but SAS is committed to providing encouragement and technical assistance to promote their progress.

This year, programs were also asked to report on other course and curricular evaluation activities in which their faculty were engaged. Over the past couple of years, the SAS Office of Undergraduate Education has realized that many faculty and departments are engaged in assessment efforts that do not always fit neatly into the program assessment report template. The responses to the new question confirm this. Appendix F provides some examples from the submitted forms. A number of responses report collaborations across departments to develop new programs and discuss teaching and assessment methods. A few departments are evaluating their introductory level courses to standardize the level at which they are taught and to attract new students to their major and minor programs. Biological Sciences conducts surveys on student study habits. The variety of activities reported makes it clear that SAS faculty are committed to finding ways to improve student learning.

2015-16 SAS Annual Assessment Report

AY 2015-16 was the second year that SAS departments were asked to report the most significant challenges faced in the process of assessment. To solicit more information on how these challenges might be addressed, departments were prompted to describe additional data, resources and/or support services that would facilitate departmental assessment efforts. Although the responses varied greatly, reflecting the heterogeneity of the SAS departments, some common themes emerged. Many departments cited the challenges presented by the growing number of courses taught by PTLs and NTTs who are less familiar, and in many cases, less invested in the assessment process. Many responses also noted the impact of shifting enrollments, leaving some departments unable to run capstone courses for their majors due to lack of enrollment and others unable to staff enough such courses to meet demand. This year, many departments also cited the need for more data. A number of departments wanted to be able to track student performance across courses in their major programs. For example, a few programs cited the desire to know how a student who earned a C in (or had to repeat) an introductory course fared in subsequent courses. Other departments asked for enhancements to classroom support technology like Sakai and test-scanning software that would make it easier to compile and analyze assessment results.

The SAS Office of Undergraduate Education is committed to providing departments the resources they need to evaluate their courses and programs effectively and efficiently. The Office has requested resources to hire a Director of Institutional Research and Technology who would facilitate and conduct analyses of undergraduate student data for SAS. This person would work with the Vice Dean and Associate Dean of Undergraduate Education to formulate and conduct analysis at the School-level, as well as work with departments to assist in the evaluations of their programs and courses. The SAS Office of Undergraduate Education will also follow up on the requests for more training and examples of best practices. Undergraduate chairs from departments with strong assessment records will be asked to discuss their experiences at Undergraduate Chair Meetings as well as in more informal settings with faculty.

As a school, SAS has made remarkable advances in assessment of student learning outcomes, and we appreciate the impetus to continually reexamine the quality and success of the undergraduate education our students enjoy, and to address the array of challenges that have been identified by our departments as they move ahead with evidence-based decision-making processes in assessment and curriculum development.

2015-16 SAS Annual Assessment Report

In sum, the SAS uses assessment practices as an important tool in maintaining excellence in undergraduate education. SAS emphasizes sustainable, efficient, and authentic assessments that provide valid practical information for decision-making about how to improve student learning outcomes and promoting a culture of continuous improvement based on evidence.

Submitted on Behalf of the SAS Assessment Committee, July 2016

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2015-16 SAS Annual Assessment Report

Appendix B: Summary – SAS Departments, Program Assessment Reports

SAS: Summary of Department Assessment Reporting	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
number of SAS departments	38	42*	42*	42*	42*	42*	42*
learning goals articulated - see SAS Undergraduate Program Learning Goals ⁶	92% (35)	100% (42)	100% (42)	100% (42)	100% (42)	100% (42)	100% (42)
annual assessment report submitted	18% (7)	98% (41)	93% (39)	95% (40)	98% (41)	100% (42)	100% (42)
assessment tools and measures used appropriate to goals	18% (7)	60% (25)	93% (39)	95% (40)	95% (39)	93% (39)	93% (39)
direct measures of assessment provided	16% (6)	33% (14)	62% (26)	64% (25)	93% (38)	90% (38)	88% (37)
changes made based on review of assessment results	8% (3)	33% (14)	71% (30)	90% (35)	90% (37)	86% (36)	95% (40)
plans/schedule for going forward included	16% (6)	98% (39)	93% (39)	95% (37)	90% (37)	76% (32)	76% (32)

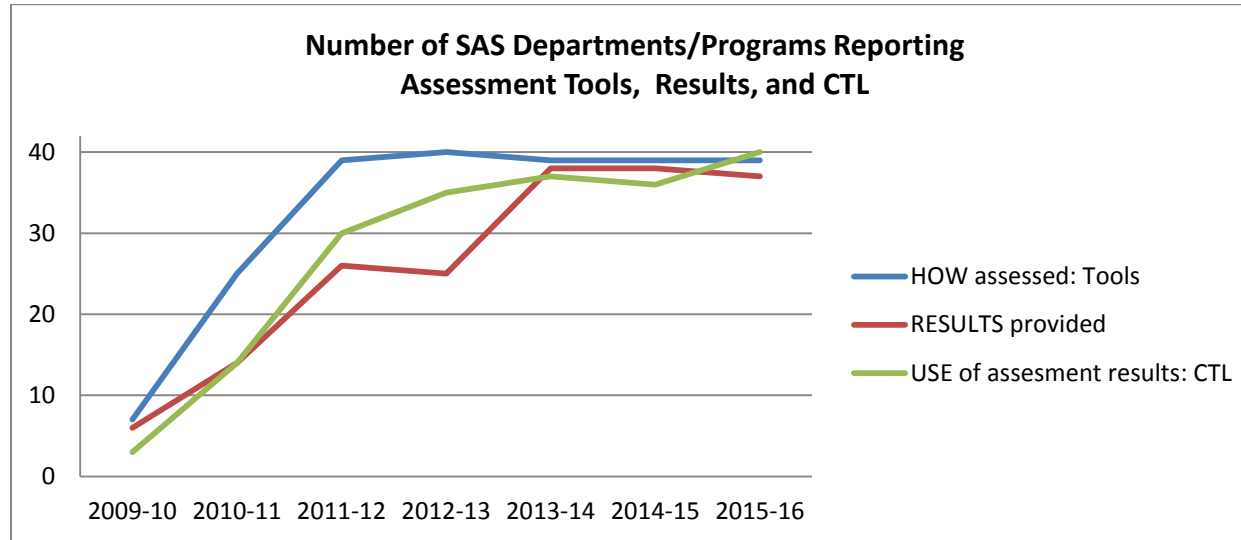
**Includes the joint SAS/SEBS major in Marine Science*

Notes: Only departments scoring 2.0 or higher included in counts. Percentages based on the number of reports submitted for that academic year.

⁶ On SAS Undergraduate Education website, at http://sas.rutgers.edu/component/docman/doc_download/532-sas-learning-goals

2015-16 SAS Annual Assessment Report

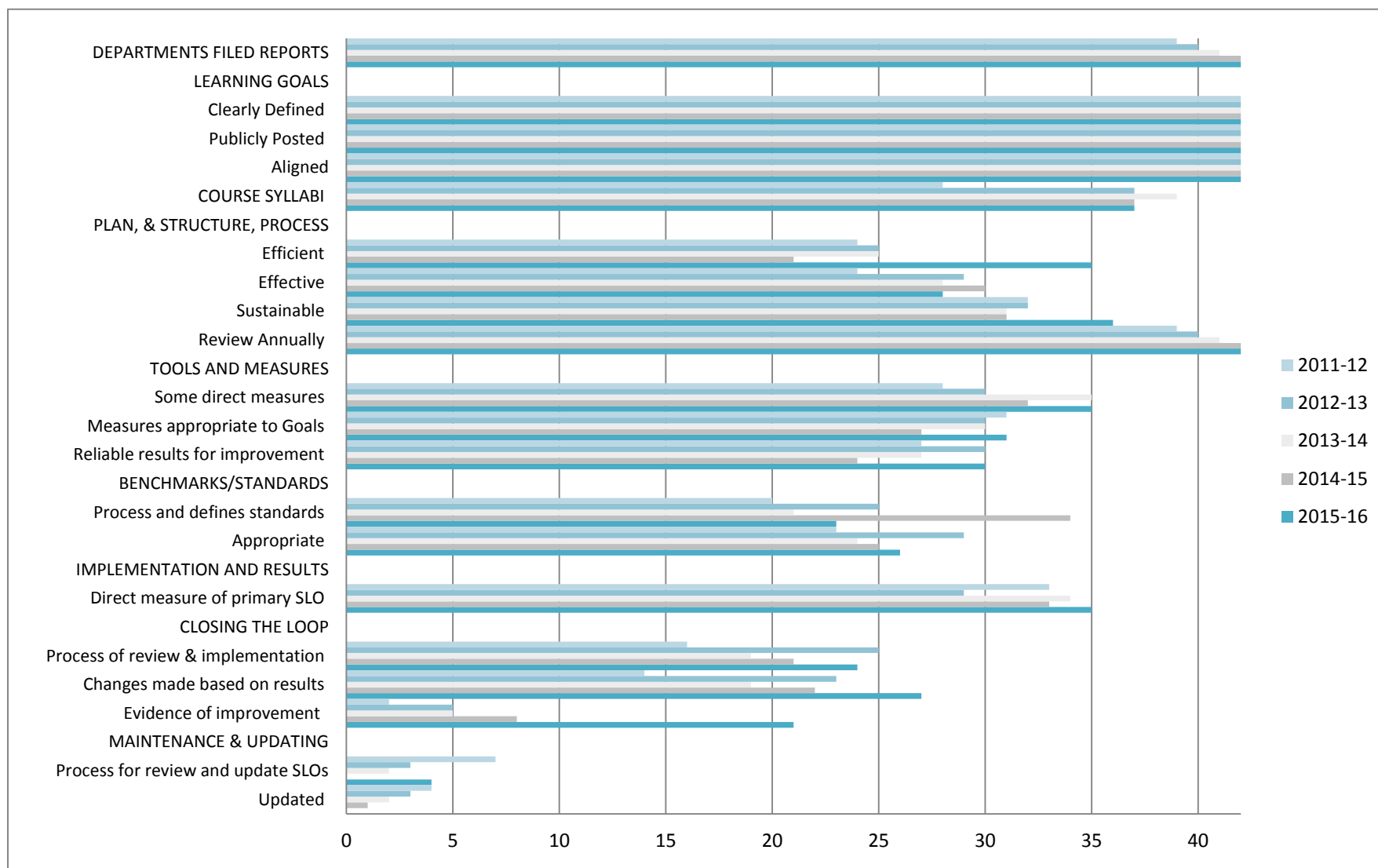
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2015-16 SAS Annual Assessment Report

Appendix C: Academic Years 2011-12 through 2015-16

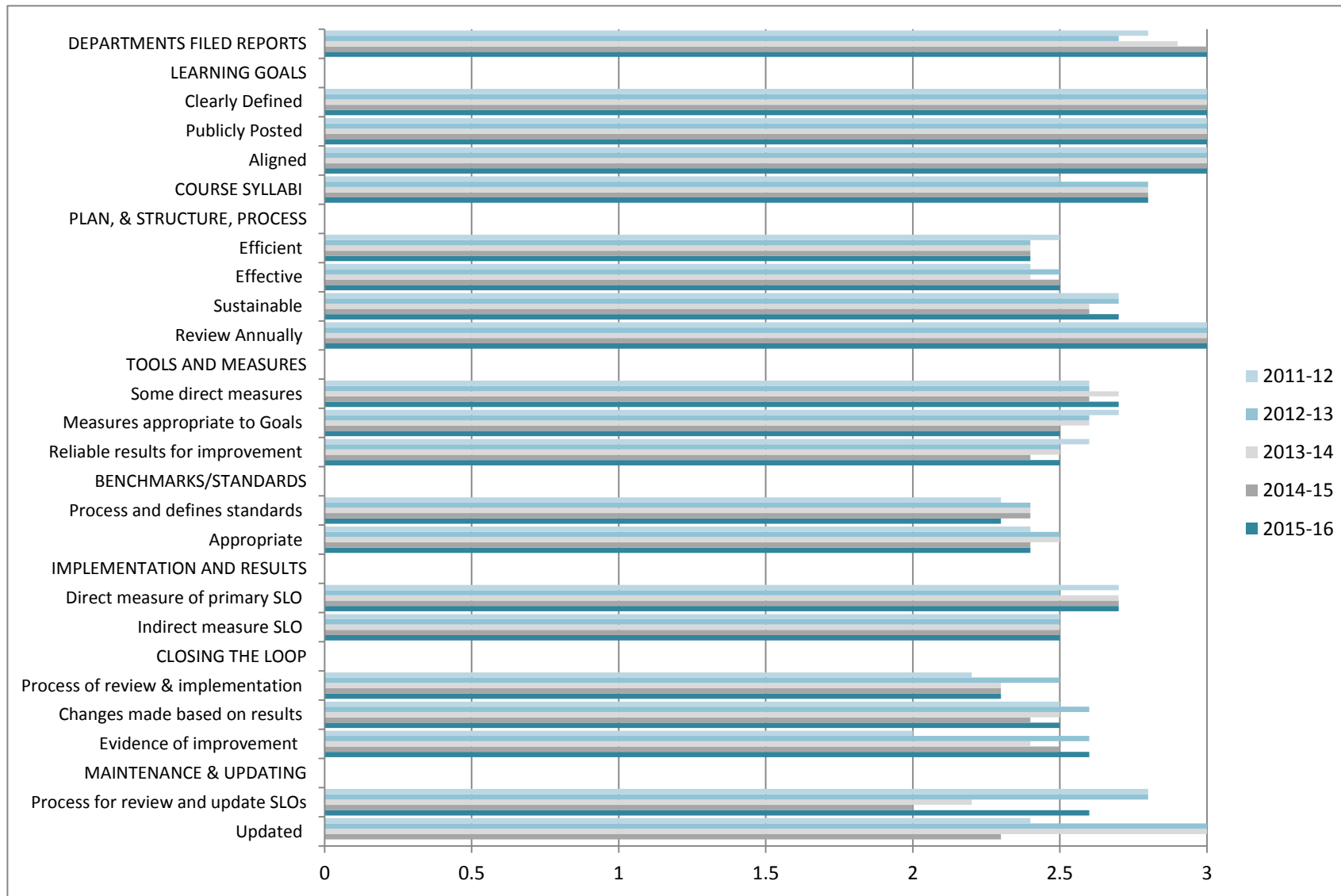
Number of SAS Departments Scoring ≥ 2.5 ('making very good' to 'exemplary' progress)



2015-16 SAS Annual Assessment Report

Appendix C: Academic Years 2011-12 through 2015-16

Average of SAS Department Scores



Appendix D: Closing The Loop Changes Made or Planned by Departments

All 42 SAS department have reported that they have made, or are planning to make, changes designed to improve student learning by addressing concerns revealed by their assessment data. Please note that a number of these were not scored in the ECA chart as a “Modification/refinement of pedagogy, curriculum, assessment tool, or learning goal based on assessment results,” because they have not yet been implemented.

African, Middle Eastern & South Asian Languages & Literatures (AMESALL)

- CTL action – curriculum and/or course changes: new major to be offered as of next academic year, with revised curriculum structure and course options more clearly aligned to global issues and focus.
- CTL action – curriculum and/or course changes: new minor options to be offered as of next academic year, to be assessed using program rubric, “self-assessment” survey.

Terms

Benchmark –the baseline level of performance that would qualify as “satisfactory.”

Capstone – used inclusively to refer to either a capstone course or another culminating experience/sequence.

CTL –“closing the loop,” e.g., taking specified action(s) in response to assessment results.

SLO – student learning outcome

Africana Studies

- CTL action – curriculum and/or course changes: new mentoring course developed in conjunction with Future Scholars Program to link program majors with high school students for academic skills development.
- CTL action – curriculum and/or course changes: developed additional mentoring course options, to be offered as permanent revision to program options as of AY 2016-17.
- CTL action – to improve student engagement with program goals, organized alumni meeting with majors, minors on contributions of program courses, curriculum to readiness for graduate study, professional success. Plan to schedule annually.
- CTL action – to improve progress to degree completion for first-generation, underrepresented and/or high-need students, collaborated with cognate department (Latino & Caribbean Studies) and Chancellor’s RU-1st initiative to revise academic and other advising supports aligned with achievement of program goal SLOs; develop new co-curricular and program elements: leadership experience, summer program, certificate option.

American Studies

- CTL action – curriculum and/or course changes: to improve SLOs for cultural competency, communication goals, added 300-level required course with co-curricular support (writing tutor). Plan follow-up re-assessments as of next academic year.
- CTL action – revised course content and delivery at entry point of major (100-level required course) as part of a formative assessment plan to improve SLOs for global competency goal.
- CTL action – changes to assessment process and/or tools: to improve specificity and usefulness of results, plan to clarify benchmarks for SLOs and refine program rubrics, with follow-up assessments in next academic year.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – to improve student understanding of program goals and performance expectations, scheduled oral presentations of senior research theses to other students (juniors); *post-CTL improvements noted* in thesis proposals later submitted. Plan to repeat in future terms.
- CTL action – plan changes to assessment process and/or tools: self-assessment survey of majors on program courses to be revised, systematizing process and administration in culminating experiences of the program.

Anthropology

- CTL action – curriculum and/or course changes: to expand student program options, collaborated with other departments in SAS and SEBS on interdisciplinary certificate, aligned with program learning goals; plan further program development with Criminal Justice program.

Art History

- CTL action – curriculum and/or course changes: to improve SLOs for research and writing goals, revisions to content and delivery of multiple entry-level (100-) courses in current year.
- CTL action – curriculum and/or course changes: improved coordination, sharing of pedagogical strategies and assessment results across revised courses of program entry level, to improve student preparation to achieve program goals in subsequent courses.

Asian Languages & Cultures

- CTL action – consulted design and content coverage of undergraduate programs in comparable departments at CIC member institutions and other research universities, to inform analysis, decision-making, and comprehensive curriculum and course re-design plans going forward.
- CTL action – finalized strategic plan for curriculum and/or course changes: to improve consistency of program requirements, improve student progress to graduation, and meet evolving demand, plan development of new major programs, revisions to course content, sequencing, requirements for all program options, including to capstone course for all majors.
- CTL action – changes to assessment process and/or tools to be implemented in conjunction with planned revisions to curriculum (new majors) and courses (capstone seminar).

Biological Sciences

- CTL action – to ensure program goals SLOs are comparable for majors completing introductory coursework other than in revised General Biology sequence at RU-NB, plan analysis on SLOs in subsequent courses of required curriculum; addition of co-curricular supports, possible transfer workshop for such majors, with follow-up assessments.
- CTL action – curriculum and/or course changes: course content, design and delivery in entry-level courses revised to better align with and assess program goal SLOs; revisions to instructional preparation associated with revised content; continuing content and delivery revisions to improve SLOs planned in next academic year and ongoing.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – to improve inter-rater reliability of assessments in culminating sequence courses, plan revisions to instructor preparation and training, resources and documentation to clarify benchmarks for SLOs, improve comparability of judgements on revised formative assessment scale.

Cell Biology & Neuroscience

- CTL action – to improve SLOs for program learning goal for analysis, synthesis and effective communication of research, worked with other DLS programs and English Writing Program to develop new course within major requirements, to be offered as of next year; plan follow-up re-assessment of SLOs for this program learning goal.
- CTL action – changes to assessment process and/or tools: to improve response rates from independent research courses at 200-, 300- and 400-level of required curriculum, integrated program assessment rubric and scoring guide with grade reporting system. Plan follow-up to increase instructor familiarity with and completion of assessments across required courses in next academic year.

Chemistry & Chemical Biology

- CTL action – curriculum and/or course changes: to improve SLOs for content mastery program goal, revised course content and delivery in (300-level) courses of required curriculum (added interactive components, hybrid exercises).
- CTL action – plan changes to assessment process and/or tools: have identified multiple specific options for **direct** assessment of program learning goals at or near program completion; assessment working group to review, makes recommendations to faculty in next academic year.

Classics

- CTL action – to increase student participation in study abroad co-curricular options directly aligned to SLOs of program learning goals, formed new working group/committee to improve allocation of funding and increase student access to such programs.
- CTL action – to broaden interdisciplinary content, improve program goal SLOs and progress to completion, plan additional hybrid, online offerings; cross-listings with collateral departments of elective courses for majors, minors; further alignment of courses with Core learning goals.

Comparative Literature

- CTL action – curriculum and/or course changes: based on current year pilot, will involve Honors students in capstone workshop to enhance peer-to-peer engagement and discussion, improve SLOs for program learning goals of all graduating majors.

Computer Science

- CTL action – curriculum and/or course changes: to improve student progress through and preparation for successive courses in required curriculum, improve program goal SLOs at or near completion, plan revisions to major/minor requirements; course content and sequencing (pre-requisite stream); review of courses in other departments for addition to elective options.

Appendix D: Closing The Loop Changes Made or Planned by Departments

Criminal Justice

- CTL action – changes to assessment process and/or tools, course content and delivery: to improve inter-rater reliability in assessments across multiple sections at entry (200- level) to required curriculum, plan changes to instructional training and coordination.
- CTL action – changes to assessment process and/or tools: revised analysis to clarify Core goals assessment results, aligned with program goals at entry (200- level) to required curriculum.
- CTL action – plan faculty focus group meetings to clarify program benchmarks for learning goals; improve inter-rater reliability in assessment of SLOs; share pedagogical strategies, and implement revisions to course content and delivery to better align assessments across sections and instructors.
- CTL action – to increase networking and development option for majors and alumni, supported recruitment and activities of new chapter of national honors society for discipline.

Earth & Planetary Sciences

- CTL action – changes to assessment process and/or tools in current year: implemented **direct** assessment in required capstone course, using pre-/post-test format, scored on program goals rubric.

Economics

- CTL action – curriculum and/or course changes: to address deficiencies in numeracy and quantitative skills, developed new mini-courses on statistics and regression to augment instruction in lower-level courses of the minor program.
- CTL action – changes to assessment process and/or tools: developed implementation process and guidelines for **direct** assessments of program goal SLOs in courses of culminating sequence; systematized instructor outreach to achieve substantial sample of results in current academic year.
- CTL action – changes to assessment process and/or tools: revised program rubrics for all goals to be implemented in follow-up re-assessments at or near program completion in next academic year.
- CTL action – curriculum and/or course changes: to improve SLOs for numeracy and quantitative skills of minors, will recommend addition to requirements of minor program of newly-developed mini-courses on statistics and regression.
- CTL action – changes to PTL, TA instructional oversight and coordination across introductory and intermediate level courses of required curriculum, to improve consistency in course content and delivery; alignment of grading and assessment with benchmarks for SLOs on program goals.

English

- CTL action – based on pilot and current year assessment results, plan curriculum and/or course changes: plan to revise guidelines for content emphasis in capstone -level seminars to improve SLOs for critical engagement and analysis goal.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – changes to assessment process and/or tools: revise capstone-level rubric to better align assessments with program goal for critical engagement and analysis; plan follow-up re-assessment in next academic year.
- **CTL action** – changes to assessment process and/or tools: faculty meetings on capstone seminars to clarify benchmarks for program goal SLOs at or near completion; share content and delivery strategies for improving achievement across these culminating experiences of required curriculum.

Exercise Science & Sport Studies

- CTL action – curriculum and/or course changes: revisions to Sciences options in major, eliminating content duplication and simplifying pathways to timely graduation, effective as of AY 215-16.
- CTL action – curriculum and/or course changes: to expand post-graduate options, collaborated with external departments (Health Sciences) to develop new 4+3 program path to post-graduate study in physical therapy, effective as of AY 216-17.
- CTL action – curriculum and/or course changes: to simplify pathways to timely graduation, further revisions to program options to be implemented in next academic year (1 new, 2 revised majors).
- CTL action – curriculum and/or course changes: to improve alignment with identified post-graduate options, and disciplinary evolution, plan revisions to course content and sequencing (pre-requisite streams); major/minor requirements; review of courses offered by collateral departments for possible replacement and/or revision in next academic year.
- CTL action – changes to assessment process and/or tools: to improve response rates and assess a more comprehensive sample of program goal SLOs in required internships, expanding implementation to all academic terms.
- CTL action – changes to assessment process and/or tools: plan to refine exit survey instrument to prompt for more specific, targeted responses, aligned with supervisor survey questions.

French

- CTL action – changes to assessment process and/or tools: to improve alignment of assessment results with program goals, revised pilot program rubric.
- CTL action – changes to course content and delivery: to better prompt students to demonstrate SLOs for program critical analysis and language proficiency goals, capstone seminars revised to require final paper rather than exams.
- CTL action – plan revisions to course content and delivery across required curriculum to improve SLOs on program learning goals for critical thinking, cultural understanding, language proficiency.

Genetics

- CTL action – curriculum and/or course changes: review of elective course options in major/minor requirements to improve alignment with evolving interdisciplinary characteristics, profile of post-graduate professional outcomes and goals of majors and alumni.
- CTL action – changes to program advising structure, processes and tools: following previously implemented revisions to advising materials and process, plan to employ new university advising

Appendix D: Closing The Loop Changes Made or Planned by Departments

software to better monitor student progress through required curriculum, to identify student issues earlier in degree progress.

Geography

- CTL action – changes to assessment process and/or tools: to increase student awareness of program goal SLOs, added assessment prompt instructions linked to goals in course materials.
- CTL action – changes to assessment process and/or tools: to improve inter-rater reliability, added scoring guides for implementation of program rubrics in direct assessments.
- CTL action – as part of scheduled assessment of Environment track next year, plan to outline a curriculum map for the track, identify program goals achieved in each course.
- CTL action – plan to implement this analysis and curriculum map development in each program track in successive years of ongoing 3-year program assessment cycle.

German

- CTL action – changes to assessment process and/or tools: to maintain reliability and validity, improve match to language proficiency goal SLOs in successive courses of required curriculum, will analyze and regularly revise language placement test items going forward.

History

- CTL action – curriculum and/or course changes: to improve instructional design and delivery and program goal SLOs in new 200-level required History Workshop, changed from team-teaching model to solo instruction, with increased coordination and sharing of pedagogical experiences and course content.

Italian

- CTL action – curriculum and/or course changes: to improve SLOs for professional preparation, research and application goals, student research symposium presentations added to capstones.
- CTL action – curriculum and/or course changes: to prompt for improved SLOs for program goals in Honors capstone, plan revisions to content and delivery, possible addition of oral defense component; revisions to benchmarks for achievement of program goals.

Jewish Studies

- CTL action – curriculum and/or course changes: new culminating sequence course added to required curriculum, to improve SLOs for research goal, serve as alternative site for direct assessments at or near program completion.
- CTL action – curriculum and/or course changes: course content and delivery revised at entry point of major (200- level required courses) to improve alignment with, better prompt for program goal SLOs.

Appendix D: Closing The Loop Changes Made or Planned by Departments

Latin American Studies

- CTL action – changes to assessment process and/or tools: following classroom observations at entry point (100-level) of the required curriculum, plan revisions to course content and delivery to improve student engagement, achievement of program goal SLOs.
- CTL action – plan curriculum and/or course changes: modifications to capstone assignment content and sequencing, with follow-up re-assessment of SLOs for program learning goals for critical research, communication goals.

Latino & Caribbean Studies

- CTL action – curriculum and/or course changes: major/minor requirements, course content revisions at entry level of required curriculum, to improve SLOs for program research methodology learning goal; plan follow-up re-assessment at or near program completion.
- CTL action – curriculum and/or course changes: to improve SLOs program learning goals for research, critical thinking, and interdisciplinary competence, plan possible course content revisions across courses of required curriculum.

Linguistics

- CTL action – curriculum and/or course changes: revised course content and delivery in 300-level culminating sequence course, to address weaknesses in SLOs for program learning goals; follow-up re-assessment in current academic year showed **post-CTL improvements**.
- CTL action – to improve consistency and quality of course content and delivery, online course coordinator to be added in next academic year.
- CTL action – changes to assessment process and/or tools: systematized classroom observation process to improve faculty feedback to new instructors, improve program goal SLOs through course design and delivery modifications.
- CTL action – revised faculty instructional workshop in this academic year to incorporate program learning goals assessment, encourage implementation across the curriculum.
- CTL action – curriculum and/or course changes: reflecting expansion of faculty resources and post-graduate career options in speech pathology/audiology, plan possible development of additional program option (certificate).
- CTL action – changes to assessment process and/or tools: exit survey of graduating students to be revised to prompt for specifics on program courses, curriculum, post-graduate outcomes and plans.

Marine & Coastal Sciences (SAS & SEBS)

- CTL action – changes to assessment process and/or tools: systematized data collection process to improve inter-rater reliability and more effectively disseminate results to department faculty.
- CTL action – curriculum and/or course changes: to improve alignment of program goal SLOs with evolution in disciplinary research breadth, revisions to major/minor requirements, course content, structure and sequencing.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – curriculum and/or course changes: to alleviate demand issues, improve timely progress and SLOs for research analysis goal, increase in scheduling frequency of required course at 300-level of program curriculum.

Mathematics

- CTL action – to improve alignment of course availability with student demand, and timely progress through requirements, scheduled expanded summer session offerings across required curriculum (100 to 300-level); added new hybrid course option at 100-level.
- CTL action – implemented revisions to special permission process and platform to improve enrollment demand monitoring, effective scheduling and seat allocation; intervene to improve SLOs and timely progress through targeted advising outreach, especially for at-risk students.
- CTL action – implemented online recitation sections in high-demand entry-level (100-) course, modeled on successful pilot in another department; will revise and re-design this initiative in next academic year for possible re-launch in AY 2017-18.
- CTL action – changes to TA instructional development process and tools, to improve coordination and consistency in course delivery; clarify benchmarks for student evaluations; improve program goal SLOs in all courses.
- CTL action – expanded involvement of department faculty in enhanced classroom observation and review process for lecturers, as piloted in AY 2014-15; added course coordinator for another large-enrollment 300- course.
- CTL action – based on consultation with undergraduate programs at comparable institutions, and recommendations of national disciplinary organization, plan additional revisions to instructional development program to improve reliability of grading and assessments; instructional delivery; revise course and co-curricular materials to further improve program goals SLOs in future terms.

Middle Eastern Studies

- CTL action – curriculum and/or course changes: plan increased instructional emphasis in all courses of the required curriculum, with increased coordination of content and delivery, to improve SLOs for program research and writing goal.
- CTL action – curriculum and/or course changes: faculty focus group/meeting on minor program goals; possible revisions to one or more goals to better align with program goals for major; to be assessed using common assessment rubric in next academic year.

Molecular Biology & Biochemistry

- CTL action – curriculum and/or course changes: piloted additional Honors sections of 200- and 300-level research experiences; to better align with enrollment patterns, will further revise schedule and course offerings in next year.
- CTL action – revised major requirements, new capstone course content and design to improve SLOs for program learning goals for effective research communication; follow-up assessments planned in next academic year.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – implemented revised course options in sequence of required research courses for all major tracks to improve preparation for and SLOs in successive research lab experiences; revisions to course scheduling and options to be offered in next academic year.

Organizational Leadership

- CTL action – changes to assessment process and/or tools: developed program rubric for additional **direct** assessment of 300-level required course, piloted in current academic year.

Philosophy

- CTL action – curriculum and/or course changes: to improve SLOs for learning goals at foundational level of required curriculum, and increase student engagement in recitations, implemented content and delivery revisions in 100-level courses.
- CTL action – curriculum and/or course changes: to improve access, academic progress for majors and non-majors, SLOs for foundational program goals, developing online sections at entry level of curriculum; plan further content and delivery development in next academic year.
- CTL action – revisions to course scheduling to improve academic achievement, timely progress through requirements for majors.

Physics & Astronomy

- CTL action – curriculum and/or course changes: as part of formative assessment plan across required curriculum, implemented course content and delivery revisions in successive courses at 100- and 200- levels of major.
- CTL action – curriculum and/or course changes: to prompt for improved SLOs for program research goals in Honors track, plan revisions to criteria for invitation, acceptance into departmental honors program.
- CTL action – curriculum and/or course changes: will consult with Engineering faculty to develop, clarify program learning goals, establish benchmarks for SLOs in 100- and 200- level courses of engineering program sequence; implement changes to course content, design, and delivery; instructional preparation, coordination, and oversight.
- CTL action – to improve tracking of post-graduate success, career outcomes, plan additional outreach efforts to alumni on professional employment and post-graduate studies.

Political Science

- CTL action – curriculum and/or course changes: to improve consistency across capstone seminars for achievement of program goal SLOs, recommending continuing revisions to course content and student requirements (research paper).
- CTL action – changes to assessment process and/or tools: to better analyze capstone assessments, plan to disaggregate student- and section-specific results, disseminate to faculty for further action.

Appendix D: Closing The Loop Changes Made or Planned by Departments

- CTL action – changes to assessment process and/or tools: first-round faculty implementation of capstone assessment, using program rubric, to be added to assessment committee review in next academic year.

Psychology

- CTL action – curriculum and/or course changes: to improve program goal SLOs with enhanced engagement and instruction, revised section sizes in required quantitative methods course.
- CTL action – curriculum and/or course changes: to relieve enrollment bottleneck following section size limits, improve timely progress to graduation, plan scheduling revisions for required methods course.
- CTL action – curriculum and/or course changes: to increase participation in co-curricular elements aligned with SLOs for program research goals, added internship course in this academic year.
- CTL action – changes to assessment process and/or tools: to increase database of results for capstone-level assessments, plan to administer in Fall as well as Spring semesters.

Religion

- CTL action – curriculum and/or course changes: as part of a formative plan to improve SLOs at or near completion for theory and methods goals, course content revisions implemented at entry point of major; may revise major requirements to include this course, add follow-up assessments.
- CTL action – plan revisions to instructional development and coordination to improve focus on program goals in course design and delivery across curriculum; clarify benchmarks for conceptual/theoretical SLOs in instructor (PTL) preparation and oversight.

Russian & East European Languages & Literatures (REELL)

- CTL action – curriculum and/or course changes: revisions to major/minor requirements, sequencing (pre-and/or co-requisites) to improve alignment of requirements with placement and progress measures on SLOs for heritage and non-heritage speakers.
- CTL action – curriculum and/or course changes: revised course content and developed new courses to improve program goal SLOs across required curriculum.
- CTL action – changes to assessment process and/or tools: will revise exit essay for majors to prompt for more specific feedback on contributions of program courses, curriculum to achievement of learning goal SLOs, post-graduate outcomes.

Sociology

- CTL action – changes to assessment process and/or tools: plan to identify embedded elements in required courses as assessment prompts for SLOs of program learning goals, to shift from indirect to direct assessments across required curriculum.

Appendix D: Closing The Loop Changes Made or Planned by Departments

Spanish & Portuguese

- CTL action – curriculum and/or course changes: course content revision at 300-level of required curriculum to improve SLOs for research and methods goals (library research workshops). **Post-CTL improvements** observed in follow-up re-assessments in current year.
- CTL action – changes to course content and delivery: to improve SLOs for oral proficiency goal, implemented co-curricular support (online interactive sessions) in all entry-level language courses. **Post-CTL improvements** observed in current year in follow-up re-assessments.
- CTL action – changes to assessment process and/or tools: to improve alignment of grading and assessment with program benchmarks, restructured content and number of oral exercises in introductory (100-) language courses in current year.
- CTL action – changes to program design or delivery: to facilitate student entry into appropriate language acquisition sequence, placement exam converted to online format.
- CTL action – curriculum and/or course changes: revisions to major requirements, course content, curriculum structure and sequencing (pre-/ co-requisites) to better align all tracks with evolving disciplinary standards and norms; introduce research methods earlier in program sequence; improve student progress through language acquisition sequence.
- CTL action – curriculum and/or course changes: to improve and assess SLOs for critical thinking and application goals, and better integrate achievement of language proficiency SLOs with other outcomes, development of integrative capstone course to continue in next academic year.
- CTL action – curriculum and/or course changes: developed new certificate for heritage speakers to improve SLOs, timely progress to completion.

Statistics

- CTL action – curriculum and/or course changes: revisions to grade requirements for entry to major, progress through required curriculum sequence. Plan follow-up re-assessment of SLOs for program learning goals.
- CTL action – to improve alignment with student demand, and timely progress through academic requirements, offered expanded course sections in upper-level courses as of current academic year.
- CTL action – to improve course availability and timely progress through requirements for majors, plan review of special permission and seat allocation processes in required courses, other enrollment management options, for possible revision in next academic year.
- CTL action – curriculum and/or course changes: to enhance SLOs for program goals, plan revisions to major/minor requirements, with expanded options for cognate course electives.

Women's & Gender Studies

- CTL action – changes to assessment process and/or tools: to increase faculty engagement, held meetings on implementation of and department benchmarks for assessment of program goal SLOs; plan to schedule required instructional trainings on program goals and assessment as of next academic year.

Appendix D: Closing The Loop Changes Made or Planned by Departments

Spanish & Portuguese

- CTL action – curriculum and/or course changes: course content revision at 300-level of required curriculum to improve SLOs for research and methods goals (library research workshops). **Post-CTL improvements** observed in follow-up re-assessments in current year.
- CTL action – changes to course content and delivery: to improve SLOs for oral proficiency goal, implemented co-curricular support (online interactive sessions) in all entry-level language courses. **Post-CTL improvements** observed in current year in follow-up re-assessments.
- CTL action – changes to assessment process and/or tools: to improve alignment of grading and assessment with program benchmarks, restructured content and number of oral exercises in introductory (100-) language courses in current year.
- CTL action – changes to program design or delivery: to facilitate student entry into appropriate language acquisition sequence, placement exam converted to online format.
- CTL action – curriculum and/or course changes: revisions to major requirements, course content, curriculum structure and sequencing (pre-/ co-requisites) to better align all tracks with evolving disciplinary standards and norms; introduce research methods earlier in program sequence; improve student progress through language acquisition sequence.
- CTL action – curriculum and/or course changes: to improve and assess SLOs for critical thinking and application goals, and better integrate achievement of language proficiency SLOs with other outcomes, development of integrative capstone course to continue in next academic year.
- CTL action – curriculum and/or course changes: developed new certificate for heritage speakers to improve SLOs, timely progress to completion.

Statistics

- CTL action – curriculum and/or course changes: revisions to grade requirements for entry to major, progress through required curriculum sequence. Plan follow-up re-assessment of SLOs for program learning goals.
- CTL action – to improve alignment with student demand, and timely progress through academic requirements, offered expanded course sections in upper-level courses as of current academic year.
- CTL action – to improve course availability and timely progress through requirements for majors, plan review of special permission and seat allocation processes in required courses, other enrollment management options, for possible revision in next academic year.
- CTL action – curriculum and/or course changes: to enhance SLOs for program goals, plan revisions to major/minor requirements, with expanded options for cognate course electives.

Women's & Gender Studies

- CTL action – changes to assessment process and/or tools: to increase faculty engagement, held meetings on implementation of and department benchmarks for assessment of program goal SLOs; plan to schedule required instructional trainings on program goals and assessment as of next academic year.

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

American Studies

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- to improve student understanding of program goals and performance expectations at or near program completion, scheduled oral presentations of senior research theses to other students (juniors); *post-CTL improvements noted* in thesis proposals later submitted. Plan to repeat in future terms.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

“We are a small department, but at least 25% of our students write senior honors theses. This year we implemented a successful program where we had our seniors give an oral presentation at the beginning of the Spring semester and invited all prospective junior theses writers to attend. This paid great dividends later in the semester when the juniors all submitted thesis proposals for work to be accomplished in 2016-17.”

“Learning goals are assessed using a variety of measures including portfolios, self-assessment, oral presentations, writing and rewriting. The senior seminar uses direct measures to ascertain research competency. Students go through a multi-step process of writing a research proposal, meeting with the instructor, making an oral presentation on the topic, submitting a draft, and then completing the research paper. At each stage students receive feedback from the instructor. ...Please see the attachment “Competencies” where we document the measurable or observable knowledge, skills, abilities, and behaviors critical to the successful performance of American Studies graduates.”

“We have made additional strides in assessment this year. We continue to monitor the system of assessment that we created and we are encouraged as a faculty by the vast overall improvement in our students’ abilities. We devoted this year to focusing on the global competency goal and decided to introduce a global component into our introductory course.”

“We intend to formalize the process whereby students in the junior seminar fill out a self-assessment report and then do so again at the end of the senior seminar. We also intend to revisit the goal of global competency and seek effective ways to measure the goal beyond the electives that we offer. Because of the success of the writing tutor whom we hired last year, we will continue to employ such a person in the years to come.”

“The assessment committee will meet in September to review results from 2015-2016 and consider new assessment measures... We hope to implement these on a trial basis in Spring 2017.”

Biological Sciences

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- CTL action – curriculum and/or course changes: to better align with and assess program goal SLOs course content, design and delivery revised in required entry-level (100-) courses of

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

General Biology sequence; implemented further revisions to instructional preparation associated with revised content; continuing content and delivery revisions to improve SLOs planned in next academic year and ongoing. *Post-CTL improvements* found in direct assessments in current year.

- CTL action – to improve inter-rater reliability of assessments in culminating sequence courses, plan further revisions to instructor preparation and training, resources and documentation to clarify benchmarks for SLOs, improve comparability of judgements on revised formative assessment scale.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

“We are quite pleased with the achieved student learning in both GB 115 and 116... less than 10% were categorized as unsatisfactory. In addition, the 3 year trend data indicates that our continued work on course alignment and design are having an impact on student learning in both outcomes I and IV. ...[and] in 117... 3 year trend data indicates that our continued work on the instruction and laboratory exercises associated with data analysis are having an impact on student learning. ...

“We now have 3 years of data indicating that students who perform very poorly on the first exam are likely to ultimately do poorly in the 115 GB I course. This data has convinced us to implement the General Biology Study Group program during the 115 course and send special invitations to students that score poorly on the first exam strongly encouraging them to participate.”

“We are encouraged with the improved student achievement since the full implementation of our new General Biology model in 2014.... [However,] more than a third of the Biological Sciences majors do not take General Biology at RU-New Brunswick and nearly one quarter of the majors transferred the course in from another institution. Given the recent revision to the General Biology curriculum we are concerned that these students may not develop the same learning skills and study habits as students who have taken the GB Workshop. Thus, we are in discussions with instructors for courses that new transfer students often register in... to develop a Workshop-like experience aimed at new transfer students in these courses.”

“The [300- and 400-level] Research in Biology courses provide students with an opportunity to achieve goals I- IV through experiential learning. Students are required to conduct an approved, life science based, independent research project under the mentorship of a Rutgers-NB faculty member and generate a... final written research paper (in journal article format).... Each course was assessed separately for Goals I-IV in the Spring 2016 by two methods: 1) analyzing student performance on the final research paper done by an independent outside reviewer not associated with the laboratories/faculty 2) faculty mentor evaluation of the full semester work, that is both the student’s performance on the research paper as well as their performance in the laboratory. ...Faculty members were provided with a grading sheet and rubric... to utilize in evaluating students’ final research paper and assigning their course grade for laboratory and research paper. They were also given a detailed rubric providing specific guidelines for assigning rankings (unsatisfactory through exemplary) and detailed descriptions of each of the learning goals (I-IV)....

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

"It was quite enlightening for us to see the differences between the faculty evaluation of their student's total performance during the semester (laboratory work plus research paper) versus our outside reviewer's analysis of just the research papers. In both analyses, the majority of students are meeting the departmental learning goals. However, faculty mentors on average tend to score their students achievement higher than what our outside review scored based solely on the research papers. We hypothesize that there may be a few reasons for this including: 1) the student's learning is not as well reflected in the final paper assignment as it is in the laboratory setting, 2) given that the faculty were given both the course grading instruction and the assessment instructions and rubric at the same time they may have confounded grading and assessment of learning outcomes, the labels may have confused faculty making them less likely to give students lower scores... In addition, ... we saw a misalignment of measurements of outcome achievement with the number and configuration of our lecture-specific student learning outcomes. ...we plan to make significant changes to the assessment process for the research courses. The development and implementation of these changes will involve both members of the Assessment Committee as well as a group of faculty mentors."

"Although we are seeing progress on student's self-reported study habits from the fall to the spring, there is still room for improvement in this area. In addition, we hope to gather additional information on the correlation between self-reported study habits and exam scores to better inform the faculty, TAs and students as we move forward."

Italian

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- to increase student participation in Honors and other research options, implemented modifications to advising outreach, aligned with program learning goals: achieved notable increase in number successfully completing senior theses - 5 of 11 graduating majors.
- curriculum and/or course changes: to improve SLOs for professional preparation, research and application goals, student research symposium presentations added to capstones. *Post-CTL improvements* found in direct assessments in current year.
- curriculum and/or course changes: to prompt for improved SLOs for program goals in Honors capstone, plan further revisions to content and delivery, possible addition of oral defense component; revisions to benchmarks for achievement of program goals.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

"Last academic year we made some progress in our students' achievement of the 'Professional Preparation' goal, in regards to their ability to conduct research and use citations. [The] Acting Undergraduate Director... led the efforts to keep focusing on this aspect, in order to make further improvements. In our literature and culture courses at the 300- and 400-levels, we have been asking students to quote from a variety of secondary sources in the last two years. After reshaping our

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

Senior Seminar, our capstone course for majors, we have continued to make adjustments to it, in order to make it more effective. This past Spring... students [were asked] to organize a symposium... where they would present the findings of their research. The event was attended also by four doctoral students, who actively participated in the Q&A session. This interaction proved to be very significant for our majors, who familiarized themselves with the format of a professional mini-conference."

"... we made substantial progress regarding another one of our goals, increasing the number of students working on Honors Theses (we had planned to engage in them the 15% of our majors). Five of our graduating seniors (out of 11) successfully completed their 40-page papers. What is even more significant, one of them, who received "Highest Honors," was awarded a Henry Rutgers Scholar Award... [and] was also accepted in the Master's Program in Italian at Georgetown University."

Linguistics

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- changes to assessment process and/or tools: revised faculty instructional workshop to incorporate program learning goals assessment, encourage implementation across the curriculum; systematized classroom observation process to improve faculty feedback to new instructors, improve program goal SLOs through course design and delivery modifications.
- curriculum and/or course changes: to address weaknesses in student learning outcomes (SLOs) for program learning goals revised course content and delivery in 300-level culminating sequence course; follow-up re-assessment in current academic year showed *post-CTL improvements*.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

"Majors and minors are assessed through embedded evidence: homework assignments, midterm exams, final exams, and written papers in all undergraduate courses. ... As of this year, we have introduced an indirect method of assessment through exit surveys."

"This past year we addressed the fact that students did not perform as well in 615:325, one of the four required courses in theoretical subfields, as in the other theoretical courses. Part of the problem lies in the more technical nature of the course. This semester the instructor was advised to work more closely with students and to look for ways to overcome this problem. There seems to be a significant shift here, as shown by the results of the direct assessment provided in the attachments, and by the response to Question #6 on the exit survey... as well as in the student instructional rating... on the teaching effectiveness of the instructor... and... on the overall quality of the course."

"We have systematized the practice of classroom observations, so that at least every new instructor has the benefit of feedback from a more experienced member of the faculty. ... We also had a

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

session on program assessment at our bi-annual “Linguistics in the Classroom” workshop in Fall 2015, where current and future instructors were briefed on issues related to assessment. ...We will analyze and develop the exit survey that we administered as a pilot this year.”

Molecular Biology & Biochemistry

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- to improve SLOs for program learning goals for effective research communication, revised major requirements, and new course content and design implemented at capstone level; follow-up assessment of SLOs for program research, writing and oral presentation. *Post-CTL improvements* found in direct assessments in current year; plan further revisions to course content and delivery in culminating sequence courses to improve these outcomes.
- implemented revised course options in sequence of required research courses for both Honors and general major tracks to improve preparation for and SLOs in successive research lab experiences; plan revisions to course scheduling and options to be offered in next academic year.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

“During the senior year, as part of a capstone experience, MBB students are required to take the MBB Seminar - Research Presentation courses (694:484). Students must give two 20-minute oral presentations with a 5-minute question period. The first presentation is on the research in their laboratory and the second is specifically on their independent research project. Members of the student's research lab, including the professor serving as their research mentor, are asked to attend. Students are evaluated on their preparation, organization, speaking style, visual aids, critical evaluation of the data, understanding of the material, and ability to answer questions by fellow students and the course instructors. Afterwards, the course instructors individually discuss the strengths and weaknesses of the presentations with each student. ... In addition to oral presentations, each MBB student must put together a poster on their research and present it at the MBB Poster Forum.... The presentation of the material, along with the quality of the research findings, and the understanding of the material are judged by a panel of MBB faculty.”

“As a part of the honors requirements, ...students wrote a thesis (40-80 pages) and presented and defended their research to two or more professors. The students were evaluated by the committee on the quality of the thesis, their oral presentation skills, and their knowledge of the material. ... Assessments of the MBB Honors students from previous years indicated that many did not start writing their theses well into the final semester. As a result, the writing was often rushed and the final outcome less than it could be. To help students initiate this process earlier, in the fall semester all Honors students were required to attend a weekly seminar on thesis writing in which they wrote several drafts of their Introduction and Methods with figures and references. They also had to give a short oral presentation of their thesis research. ... The Honors Thesis Seminar was given in Fall 2016 for 17 students. The assessment for the revised second draft (D2) for the introduction

Appendix E: Evidence of Improvement Based on Changes Made in Response To Earlier Assessment Results

chapter of the students' theses... showed significant improvements in their ranking for several of the listed goals. Almost all showed significant improvement between the first and second draft of the thesis. A review of the final version of each student's thesis by the professor teaching the course indicated that the students showed further improvement in all of these goals."

"During the past year, the faculty discussed several options to introduce the SAS Core Curriculum Writing and Communication Goals (WCd and WCr) into required courses for its majors. One approach considered was to incorporate the WC goals into the MBB Seminar (694:383) taken by majors in the fall of their 3rd year. However, this would require increasing the course from 1 to 3 credits. Since the MBB major already requires more credits than most other majors, there was concern that requiring additional credits would drive students from the major. We therefore developed an optional independent research course (694:385) in which students would conduct research projects in laboratories on campus but would also attend a weekly 55 min class that would go over approaches to writing in the sciences. Students would prepare and review several drafts of a report in the format of a scientific article describing their research. This course will satisfy part of the independent research requirement of the major along with the WCd and WCr Core goals. It was approved by both the SAS Curriculum and Core Curriculum Committees in Spring 2016."

Spanish & Portuguese

CTL Action: based on prior assessment results, the following actions were implemented or planned:

- revised course content and delivery: to improve SLOs for oral proficiency goal, co-curricular support implemented in all entry-level (100-) language courses - online interactive sessions added to course content. **Post-CTL improvements** observed in current year in follow-up formative re-assessments.
- curriculum and/or course changes: to further facilitate student placement into appropriate language acquisition sequence, converted placement exam, aligned to formative assignment process, to online format.
- revised course content and delivery: to improve SLOs for research and methods goals, added library research workshops directly aligned to research projects at 300-level of required curriculum. **Post-CTL improvements** observed in follow-up re-assessments in current year.

From 2015-16 Report: results of follow-up re-assessment of SLOs for program learning goals show post-CTL improvements, and areas for further action:

"... the adoption of the [new textbook]... has been very fruitful at the beginner's level. Virtual language coaching has been used as a supplement to strengthen student oral performance and listening skills at this level. In addition to face to face interactions with instructors, students... have the opportunity to schedule six online meetings with a different language coach native of Guatemala. This virtual interaction with a native speaker... has increased the quality in production of knowledge at the beginner level."

"Instructors of language courses meet regularly with the Language Coordinator to discuss students' progress, homework, rubrics, SAKAI tools, etc. As planned in last year's report, more

**Appendix E: Evidence of Improvement Based on Changes Made in Response
To Earlier Assessment Results**

emphasis has been placed in assessment tools that measure oral skills during this academic year. Language labs have been an important tool for the delivery of assessment.”

“The Language Coordinator and instructors have been actively involved in re-structuring of assessment at [the introductory 100-] level. It was agreed that a greater percentage would be given to oral participation. Additional test and quizzes have been added to the course requirements. This... has been instrumental in decreasing grade inflation. By increasing the number of language labs... [i]nstructors across the board have a better understanding of a student’s oral performance and skills. ...During this academic year students listening and aural skills [were] assessed three times by the course instructors. As of this academic year all students have to take the common hour midterm and final exams. ...Currently the language coordinator and instructors have been working on syncing all deadlines to ease the submission of warnings and administrative reports.”

“As explained in last year’s report,... [01:940:313] is a preamble to the preparatory courses for the Oral Proficiency Interview (388/389 and 499). Hence, students are asked to record themselves while delivering oral presentations. To facilitate this task, students go on field trips and are required to report their visit to different places, such as a visit to the museum. They are monitored and receive adequate feedback from the instructors who discuss their work by means of a rubric. One of our goals has been fulfilled as majors have moved in their rankings to Advanced Low in the Oral Proficiency Interview.”

“Faculty continue to include mini-workshops on resources from our library system as part of their syllabi. As a result, students are strengthening their familiarity with all resources available to conduct research. They are also reporting an increased awareness of the methodological steps necessary to produce critical work and cite bibliographical sources.”

“... students are also expected to design experimental projects and report their results. At the upper level courses most students have the ability to work in collaboration with their peers. Students that responded effectively to being paired up with their classmates to review journal articles demonstrated maturity in identifying, planning and executing tasks for a project. ... students that lacked the skills to conduct these assignments had basically no training on the experimental aspects of the field. Faculty members suggested that students be introduced to the experimental aspects of the field earlier in their studies to alleviate the pressures that students feel when confronted with a task that they feel is monumental given their lack of exposure to critical thinking and methodologies.”

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

Africana Studies

The Africana Studies Department (together with the Latino Studies Department) is working closely with Chancellor Edwards's RU-1st Initiative, which aims to increase support, coordination and programming for first-generation, high-need and/or underrepresented students. A central part of the RU-1st initiative is the Paul Robeson Leadership Institute (PRLI), which provides these students with an infrastructure of support that is specifically geared towards increasing their graduation rates. The PRLI includes a summer bridge experience and a Leadership Certificate which will be coordinated through the Department of Africana Studies.

American Studies

The American Studies Department is located in the Ruth Adams Building on the Douglass Campus. Our administrative team provides services for the related departments of French and Classics, under the Humanities umbrella. As a result of this proximity, all three Undergraduate Directors in this grouping actively share information and resources on teaching and assessment methods.

Anthropology

We continue to work on collaboration with other departments. For example, we collaborate with [the SEBS Department of Ecology, Evolution, and Natural Resources]...on a certificate program. We work with [Latino & Caribbean Studies]... and are planning on greater collaboration with Criminal Justice.

Biological Sciences

Course Alignment/GB Database Project

General Biology is currently developing a database that will allow for item development and data analysis of the course. Components of the project include course topics, lecture-specific student learning outcomes, informational organizers and exam questions.

Additional Evaluations

The Biology Program engages in a number of additional assessment activities to obtain supplemental data. (1) To gain an objective perspective of how the program compares nationally and among divisional units within Rutgers... an analysis is performed utilizing MCAT data. (2) To monitor the academic engagement of students' and their progress of in the learning process, that leads to the achieving of student learning outcomes, study habit surveys are conducted throughout the academic year. (3) To illuminate the unique dynamics within the course, an analysis of final grades is performed utilizing SAT scores, ethnicity, gender and performance on the first exam. ... (4) To gain an understanding of our student population in the Biological Sciences major we also performed an analysis to determine how many of our students take General Biology here in Rutgers-NB. It is our hope that such analyses will enable us to better serve our transfer student population.

(1) MCAT

The.... new MCAT exam has 4 sections: Biological and Biochemical Foundations, Chemical and Physical Foundations, and Critical Analysis Reasoning Skills and Psychological, Social, and Biological Foundations of Behavior (new). We analyzed the Biological and Biochemical Foundations scores that our students earned as a measure of whether or not they successfully

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

achieved Biological Sciences Program Learning Goals I and IV For comparison..., we also analyzed their scores Chemical and Physical Foundations, Critical Analysis Reasoning Skills and Psychological, Social, and Biological Foundations of Behavior.

451 students with a major in Biological Sciences graduated in 2016...; 358 from SAS and 93 from SEBS. 280 of those students registered with the Health Professions Office (HPO) and thus explored the possibility of a clinical career at some point during their undergraduate education (229 or 64% of the SAS Bio Sci majors and 51 or 55% of the SEBS Bio Sci majors). Although many of our students are initially interested in a clinical career, for many the liberal arts experience ultimately takes them in a different direction. Thus, 43% of the students who explored a clinical career, measured by registering with the Health Professions, took one of the pre-professional exams: 100 took the MCAT ... 70 SAS students took the new exam, and 16 the old[;] 10 SEBS students took the new exam and 4 the old. In addition, 21 took the DAT (18 from SAS and 3 from SEBS) and 1 took the OAT.

New MCAT

Biological and Biochemical Foundations

	Outstanding (90+ %)	Good (60-89%)	Satisfactory (20-59%)	Unsatisfactory (0-19%)
SAS	11 (16%)	28 (40%)	27 (39%)	4 (6%)
SEBS	2 (20%)	3 (30%)	5 (50%)	0 (0%)
Total	13 (16%)	31 (39%)	32 (40%)	4 (5%)

Chemical and Physical Foundations

	Outstanding (90+ %)	Good (60-89%)	Satisfactory (20-59%)	Unsatisfactory (0-19%)
SAS	11 (16%)	32 (46%)	24 (34%)	3 (4%)
SEBS	0 (0%)	4 (40%)	6 (60%)	0 (0%)
Total	11 (14%)	36 (45%)	30 (38%)	3 (4%)

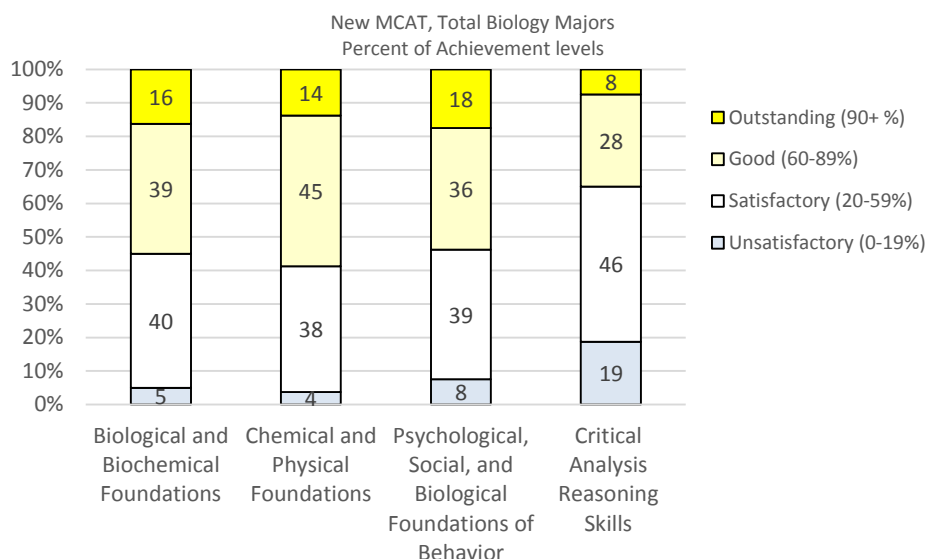
Psychological, Social, and Biological Foundations of Behavior

	Outstanding (90+ %)	Good (60-89%)	Satisfactory (20-59%)	Unsatisfactory (0-19%)
SAS	13 (19%)	24 (34%)	28 (40%)	5 (7%)
SEBS	1 (10%)	5 (50%)	3 (30%)	1 (10%)
Total	14 (18%)	29 (36%)	31 (39%)	6 (8%)

Critical Analysis Reasoning Skills

	Outstanding (90+ %)	Good (60-89%)	Satisfactory (20-59%)	Unsatisfactory (0-19%)
SAS	5 (7%)	17 (24%)	35 (50%)	13 (19%)
SEBS	1 (10%)	5 (50%)	2 (20%)	2 (20%)
Total	6 (8%)	22 (28%)	37 (46%)	15 (19%)

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged



Old MCAT

Biological Sciences	Outstanding (12+)	Good (9-11)	Satisfactory (6-8)	Unsatisfactory (0-5)
SAS	5 (31%)	7 (44%)	2 (13%)	2 (13%)
SEBS	0 (0%)	2 (50%)	1 (25%)	2 (13%)
Total	5 (25%)	9 (45%)	3 (15%)	3 (15%)

Physical Sciences	Outstanding (12+)	Good (9-11)	Satisfactory (6-8)	Unsatisfactory (0-5)
SAS	5 (31)	6 (38%)	5 (31%)	0 (0%)
SEBS	0 (0%)	2 (50%)	1 (25%)	1 (25%)
Total	5 (25%)	8 (40%)	6 (30%)	1 (5%)

Verbal	Outstanding (12+)	Good (9-11)	Satisfactory (6-8)	Unsatisfactory (0-5)
SAS	0 (0%)	7 (44%)	8 (50%)	1 (6%)
SEBS	0 (0%)	1 (25%)	2 (50%)	1 (25%)
Total	0 (0%)	8 (40%)	10 (50%)	2 (10%)

It was not unexpected that students who took the old MCAT exam, that is, were ready to take the exam earlier in their career, appeared to have stronger scores, as those are... among our most academically capable students. Even so, 95% of the Biological Sciences majors who took the MCAT exam met program learning goals I and IV. ... Critical Analysis Reasoning Skills unsatisfactory percentiles were considerably higher than the other areas (19%)... [, yet] over 50% of our majors were outstanding or good as measured by Biological and Biochemical Foundations, Chemical and Physical Foundations, and Psychological, Social, and Biological Foundations of Behavior. Over a third of... our majors were outstanding or good as measured and Critical Analysis Reasoning Skills. We look forward to see the impact of the educational

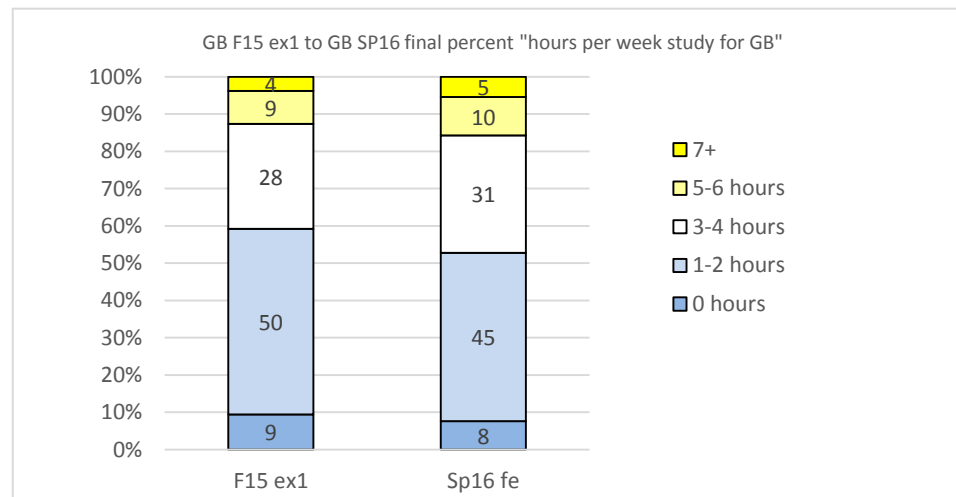
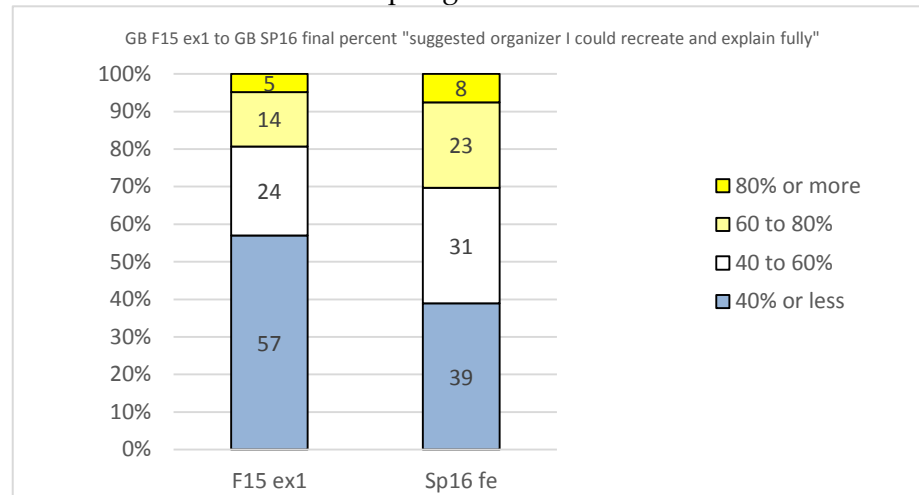
Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

changes that have been implemented in over the last few years in 119:115 & 116 and 119:117 on the MCAT scores in approximately three years.

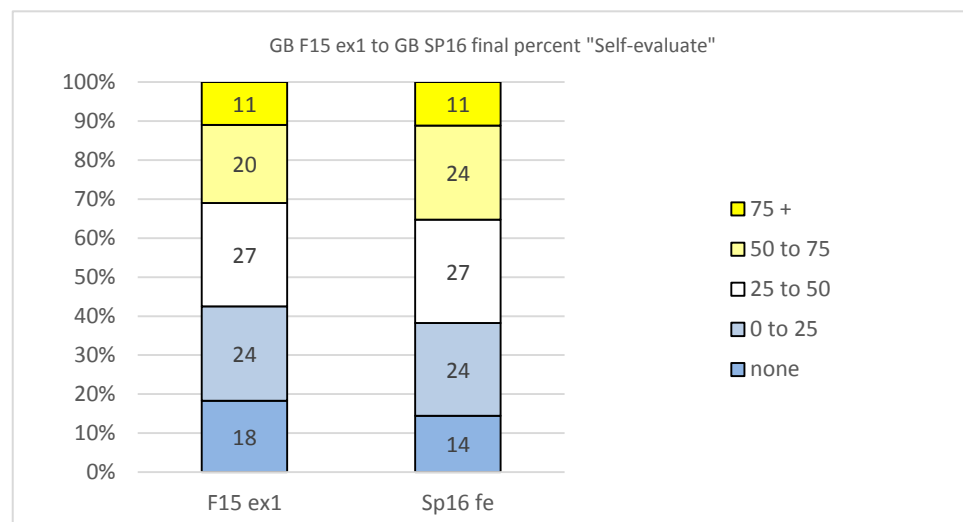
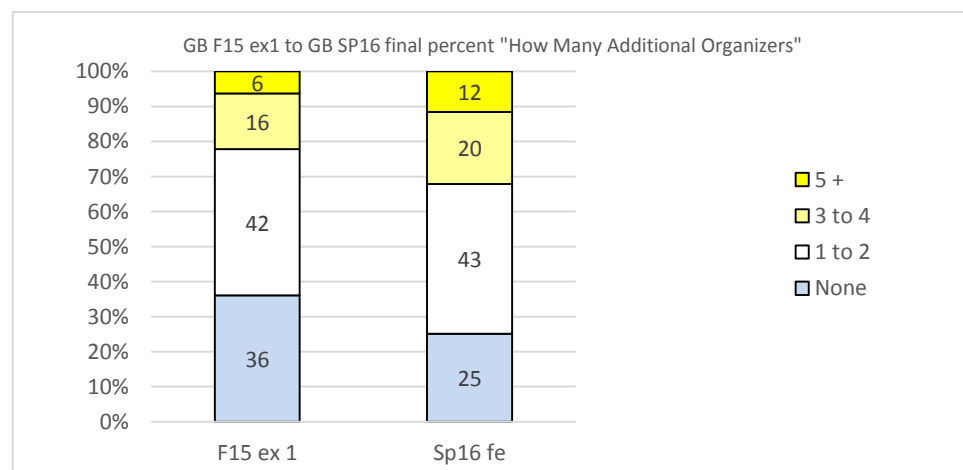
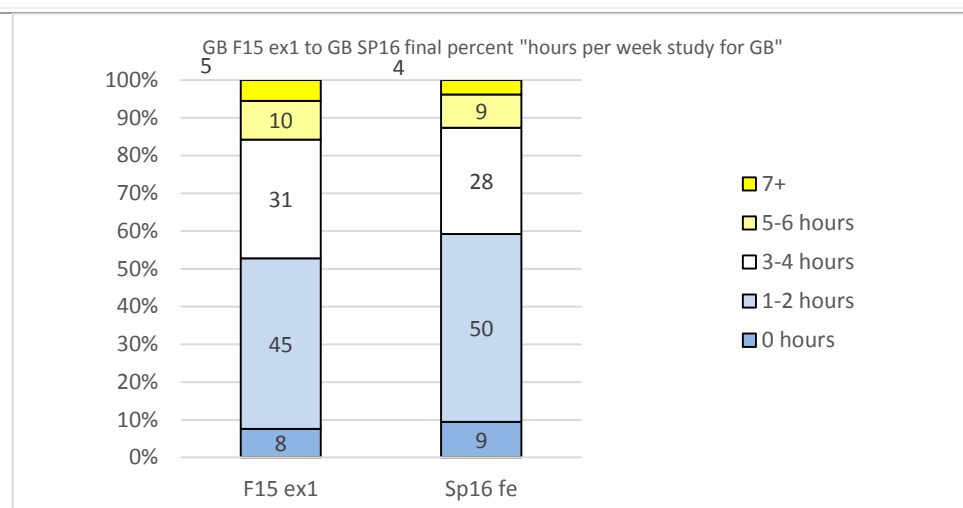
(2) Study Habits Survey

Although we are seeing progress on student's self-reported study habits..., there is still room for improvement in this area. In addition, we hope to gather additional information on the correlation between self-reported study habits and exam scores to better inform the faculty, TAs and students as we move forward.

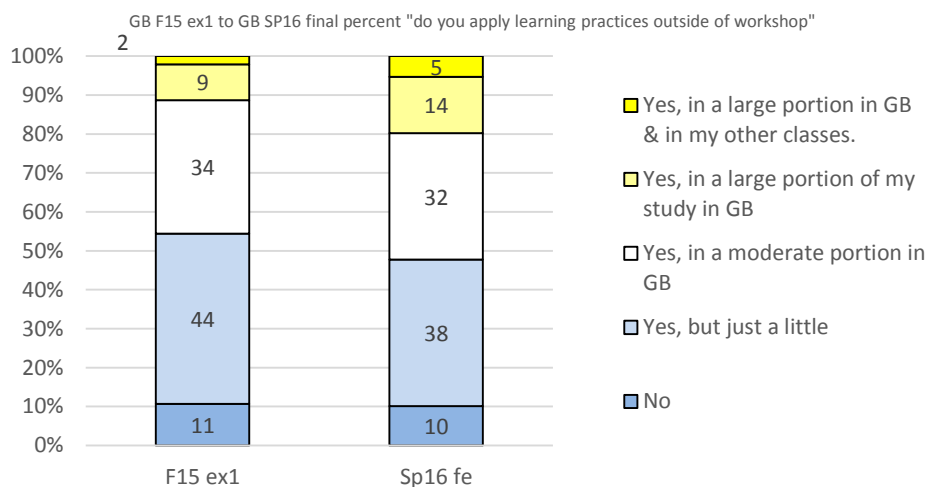
119:115 Fall 2015 to 119:116 Spring 2016



Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

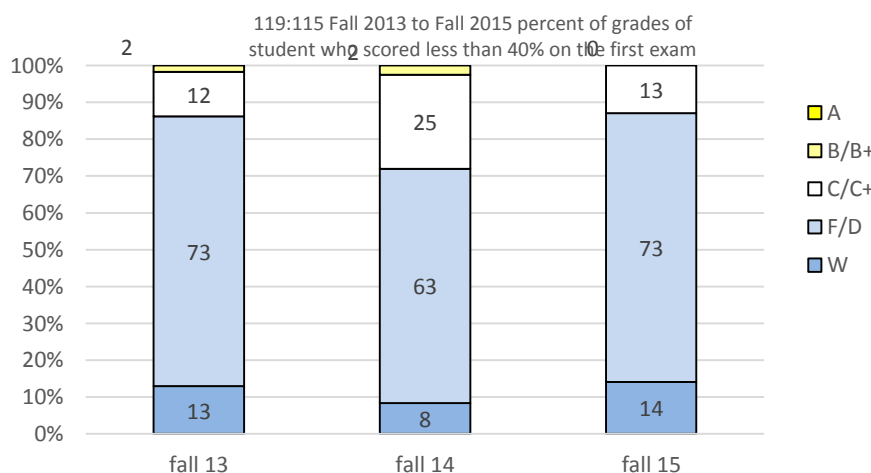
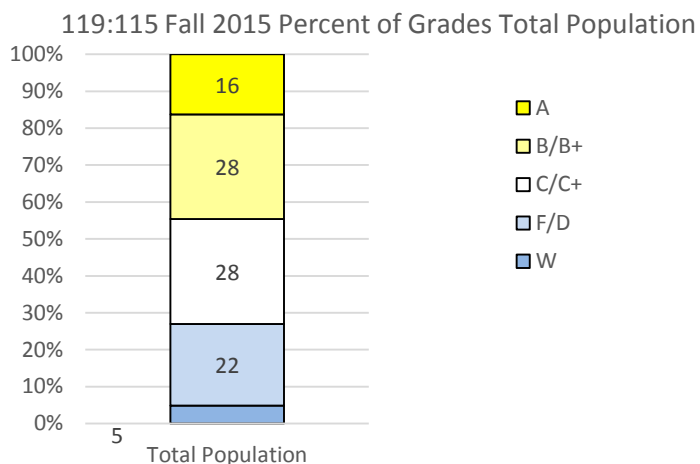


Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged



(3) Retention Data - 119:115 Fall 2015

We now have 3 years of data indicating that students who perform very poorly on the first exam are likely to ultimately do poorly in the 115 GB I course. This... has convinced us to implement the General Biology Study Group program during the 115 course and send special invitations to students that score poorly on the first exam strongly encouraging them to participate.



Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

(4) Biological Sciences student population

General Biology coursework

	RU-NB	RU-other	AP (and IB)	TR
SAS	210 (59%)	7 (2%)	55 (15%)	86 (24%)
SEBS	53 (57%)	1 (1%)	17 (18%)	22 (24%)
Total	263 (58%)	8 (2%)	72 (16%)	108 (24%)

As can be seen from the table above, more than a third of the Biological Sciences majors do not take General Biology at RU-New Brunswick and nearly one quarter of the majors transferred the course in from another institution. Given the recent revision to the General Biology curriculum we are concerned that these students may not develop the same learning skills and study habits as students who have taken the GB Workshop. Thus, we are in discussions with instructors for courses that new transfer students often register in (e.g. Genetics and Essentials of Cell Biology and Neuroscience) to develop a Workshop-like experience aimed at new transfer students in these courses.

Chemistry & Chemical Biology

Tables 1a and b, presented below, show the distribution of options (variations of the major) selected by the chemistry majors of the classes of 2015 and 2016. The sorting of students on the basis of the year of admission should distinguish, albeit imperfectly, between transfer students and traditional four-year students. For example, it seems likely that most students admitted during or before 2011 were on the conventional four-year trajectory, but a few could have been transfer students

For each of the last two years, the Core option has been by far the most popular and the overwhelming favorite of transfer students. About 1/6 of the students choose the ACS option. The availability of the various options may attract more students to Chemistry than would otherwise enroll, but ultimately it would seem that only a few strong-minded undergraduates sign up for these more specialized tracks.

Tables 2a and 2b, also presented below, show some statistics for 'traditional four-year' and transfer students. With data for two years, some differences begin to look statistically significant. It would appear that the transfer students have lower overall GPAs than do the four-year students. The data for GPAs in the major are ambiguous. As noted above, transfer students are also more likely to choose the Core, perhaps because it requires fewer credits, but also perhaps because the other options seem more challenging.

Twenty-six students graduated in 2015 with a minor in chemistry. In 2016 the number was 35. The average cumulative GPAs of students minoring in chemistry were 3.47 for 2015 and 3.30 for 2016, noticeably higher than the respective averages for Chemistry majors. In 2016, at least 17* of the 35 students who minored in chemistry majored in fields directly related to the life sciences. The others were all over the academic if not the alphabetic map, from Africana Studies to Astrophysics.

*Five of the 2016 minors in chemistry had mystery majors (117, 125, 155, 709, and 799) not identified at <http://sasundergrad.rutgers.edu/academics/requirements/list-of-majors-and-minors>.

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

Table 1a. Chemistry majors, 2015: options

Option	Year of admission		
	All	≤2011	>2011
Core	31	22	9
General ACS	8	7	1
Chemical Biology	2	2	0
Chemical Physics	3	3	0
Environmental	1	1	0
Business Law	1	1	0
Other	2	1	1
Sum	48	37	11

Table 1b. Chemistry majors, 2016: options

Option	Year of admission		
	All	≤2011	>2011
Core	38	26	12
General ACS	5	4	1
Chemical Biology	0	0	0
Chemical Physics	1	1	0
Environmental	0	0	0
Business Law	1	1	0
Other	0	0	0
Sum	45	32	13

Table 2a. Chemistry majors, 2015: academic profile

	Year of admission	
	≤2011	>2011
Number	37	11
Average years to graduation	4.54	2.45
GPA Major	3.06	2.71
GPA cumulative	3.20	2.93

Table 2b. Chemistry majors, 2016: academic profile

	Year of admission	
	≤2012	>2012
Number	32	13
Average years to graduation	4.94	2.54
GPA Major	3.00	3.01
GPA cumulative	3.18	3.02

Latino and Caribbean Studies

SAS Core Curriculum

In 2015-2016, in collaboration with other departments, we certified two of our courses for SAS Core Goals in Writing and Communication. This certification aligns with our focus on helping students to improve their analytical writing skills.

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

- 01:595:240 / 01:050:240 Latino Literature and Culture [WCR]
- 01:595:307 / 01:050:327 / 01:070:321 Latino Ethnography [WCR, WCD]

EOF Collaboration

In collaboration with the Equal Opportunity Fund program, in Fall 2016 we have designated two sections of our introductory courses 595:100 Introduction to Caribbean Studies and 595:101 Introduction to Latino Studies as EOF student sections.

Latin Images Living-Learning Community (LLC)

We are developing a 1.5-credit “Latinidades: Images and Identities” seminar for the Latin Images Living-Learning Community (Fall 2016 and Spring 2017). Faculty will be invited to visit the seminar in the fall or spring. We have designated one section of 595:101 Introduction to Latino Studies for Latin Images students.

Mathematics

We have engaged in discussion, mostly informal, with a number of related departments to assess whether students are receiving the mathematical preparation they need for subsequent courses in other disciplines. These include discussions with Physics and Chemistry, especially regarding modes of instruction (use of clickers in lectures, use of online synchronous instruction), and with the School of Engineering (should Math 244 be completely rewritten with linear algebra as prerequisite, should Matlab assignments be incorporated into 244 and 421).

III. Plans for New Assessment Practices and CTL actions in 2016-17

1. Continue trying to gather scores obtained by mathematics majors on the GRE mathematics subject test, and on actuarial exams.
2. Reach out to math majors post-graduation, and gather data on their academic and professional activities.
3. Investigate time to graduation for mathematics majors.
4. Gather student performance data for the new course format in the large 3-credit lectures, and assess the effectiveness of the new format.
5. Assess the educational effectiveness of technologies used in courses, in particular Webwork in Math 135 and Webassign in 151-152.
6. Review the content and format of the TA Training program, in light of changing teaching needs on the part of graduate students.

Philosophy

...In Spring 2017, we will undertake a large-scale review of our grading. It is of great importance to any viable program to ensure that the grading of its students is done accurately, and our undergraduate program is no exception. We will also, in Fall 2016, have a substantive discussion about the best method for undertaking a rigorous and appropriately self-critical review.

... Once we have completed our review of the PHIL 201 instructors this summer, in consultation with ... (our resident logic specialist), we will communicate with instructors of all our 200-level logic courses

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

to ensure that the grading and teaching standards are kept appropriately high. ...since the 200-level logic courses are the most common specific prerequisites for our upper-level teaching....

...We will continue and broaden our discussions on how to make our undergraduate program as good as it can be, and.... [i]n addition to a possible revision of our undergraduate program structure and continued attention to our instructors' grading standards, this will involve efforts to give our majors (and minors) a sense of progress as they move through the program and a real sense of connection to the department. ... We plan to survey our graduating majors, and those at other stages of the degree program, beginning in Fall 2016. We will then consult on how to proceed with the findings. ...we hope to learn how to give students a sense of clear progress through the stages of the program and to address any other points that may be easier for students to see.

Physics & Astronomy

Members of our department have worked closely with physics education research experts, Suzanne Brahmia in the Physics Department and Eugenia Etkina of the Graduate School of Education and Physics Department to implement discovery-based learning techniques into the department's course. In the past two years reforms have focused on the non-honors introductory sequence taken primarily by engineering students.

For the first year courses, Physics 123 and 124, starting in academic year 2014 reforms were implemented to the weekly recitation sections. Pre and post testing (CLASS, FCI and the departmental exam database) was used to establish a baseline prior to transformation. Collaborative problem solving replaced the instructor-at-the-board method. Quizzes were standardized across the course. Materials were created for each week's recitation including a pre-recitation activity and worksheet. Assessments were made using questions from the department's exam database on hourly and final exams. The students performed better on thirty-four of the thirty-nine repeated questions than had students in prior years. The improvement of the average on the repeated exam questions was statistically significant with the score on these questions increasing from 57.2 to 65.6.

For the second year courses, Physics 227 and 228, starting in academic year 2015 reforms similar to those listed above were implemented to the weekly recitation sections. The results are currently being assessed. Those faculty involved in these courses, conclude that increasing the length of the 227 and 228 recitation sections from 55-minutes to 80-minutes would significantly increase the effectiveness of the discovery-based techniques and is consistent with a greater emphasis on recitations over the traditional lecture. We plan to request this change to the SAS Curriculum Committee in the coming fall.

For the second year lab courses, Physics 229 and 230, starting in academic year 2015 changes were made to the weekly 3-hour labs. These included more closely synchronizing the labs that the students do each week with the material covered that week in the corresponding lecture courses 228 and 227, modifying substantially the content of the labs, transforming the assessments of the lab work and the way in which the lab teaching instructors were trained. Three types of labs were implemented: observational labs that the students do before attending lecture, applications labs done after lecture and testing labs done after the lecture that allow the students to test the theory that was learned in lecture.

For the coming academic year, we plan to work with the School of Engineering to establish a set of

Appendix F: Other Course/Curricula Evaluations, Collaborations or Reforms in Which Engaged

learning goals across the entire engineering sequence: 123, 124, 227, 228, 229, 230. We will work with the instructional staff to better align all parts of each course and the courses with each other. We will assess the changes in 227/228 and in 229/230. We will create a blended set of workshop handouts for 123/124. We will rewrite lab handouts to better include self-assessment rubrics. We will implement lab and recitation inspired exam questions. We will emphasize professional development to more strongly target instructor classroom management skills for both the recitations and labs.

We will continue the successful collaboration within the TRADAS support group to draw on experiences from other departments both within and outside of Rutgers and to share our experiences both those that were successful and those that were not with other departments.