

Annual Assessment Report
School of Environmental and Biological Sciences
May 31 2013

The School of Environmental and Biological Sciences made extensive progress over the past year in establishing and implementing assessment among all programs within the School. Building on these developments, we anticipate significant further progress in the next year in establishing a culture of assessment throughout the School.

The School supports 16 undergraduate majors: Agriculture and Food Systems; Animal Science; Biochemistry; Bioenvironmental Engineering (five year joint program with School of Engineering); Biotechnology; Ecology, Evolution, and Natural Resources; Environmental Business Economics; Environmental Planning and Design; Environmental Policy, Institutions, and Behavior; Environmental Sciences; Food Science; Marine Sciences (joint program with School of Arts and Sciences); Meteorology; Microbiology; Nutritional Sciences; and Plant Science. Data on all 16 majors are summarized here. This report does not address assessment within the nine majors available to SEBS students but supported by the faculty of other schools at Rutgers-New Brunswick.

Program and Course Assessment

Four undergraduate programs at the School have mature assessment plans driven by requirements of external professional organizations. Assessment in three of these—the Dietetics option in Nutritional Sciences, the Landscape Architecture option in Environmental Planning and Design, and the five year Bioenvironmental Engineering major—is driven by regular and mandatory professional accreditation processes that include an extensive self-study and follow-up site visit, while assessment in the fourth—the Research option in Food Science—is driven by a regular, albeit voluntary, and less rigorous approval process. The remaining majors, and in some cases other options in those programs with outside accreditation, necessarily have less mature assessment plans.

Due to the leadership and efforts of the Program in Science Learning (<http://sciencelearning.rutgers.edu>), under the guidance of Dr. Rebecca Jordan, programmatic assessment information for each of the 16 SEBS majors is now available online at <http://benedick.rutgers.edu/sebsassessment.php> (select a program from the drop down menu to view assessment information.) This site includes the following information on each of our programs: a short description of the program; link to a list of individual program courses with syllabi; the program learning goals; an overview of the program assessment plan; and a list of the members of the program assessment committee. In addition, each program has

provided a year-end report (downloadable from the site) summarizing evaluation procedures and program and course evaluation data for the 2012-13 academic year and/or progress towards collecting such data.

Fifteen of the 16 SEBS majors have clearly defined programmatic learning goals and assessment plans; learning goals in the Agriculture and Food Systems major, unfortunately, are still under development. The specificity and clarity of these programmatic learning goals is satisfactory in nearly all cases; constructive feedback has been provided about their learning goals to programs where appropriate. In an effort to institutionalize the assessment process, as well as make it more cooperative and inclusive, each program has been asked to appoint an Assessment Committee responsible for periodic review of the program and oversight for evaluation of individual courses within the program. All 16 programs have identified such a committee, with only three committees (in Bioenvironmental Engineering, Meteorology, and Nutritional Sciences) consisting solely of the undergraduate program director (UPD).

Fifteen of our 16 programs have outlined a fairly detailed assessment plan that identifies specific procedures for collection, evaluation, and interpretation of student data on a regular and timely basis. These data include but are not limited to: student performance in a capstone or other specific courses; mid-level or exit questionnaires; exit interviews; job or professional school placement; SIRS results. In some but not all cases, plans include specific procedures for addressing deficiencies. The assessment plan for the remaining program (Agriculture and Food Systems) is, again, under development. Evaluation data for specific programs is available in some of the yearend reports. We will be working with the undergraduate program directors throughout the coming year to clarify these plans and to encourage and ensure that programs are collecting data on the effectiveness of their programs in a regular and timely manner.

Perusal of these reports indicates, for example, that in the 2012-13 academic year:

The Bioenvironmental Engineering program was evaluated, along with the other undergraduate engineering programs in the School of Engineering, for re-accreditation by ABET in fall 2012. Their extensive self-study is available at the assessment url listed above. The program was successfully re-accredited for six years.

The Environmental Business Economics program instituted an exit interview for graduating seniors, which revealed that 80% of the 2013 graduates agree or strongly agree that the program “connect course content to relevant real-world issues”, and, in response to evaluation data, developed a new course *Corporate Citizenship and Social Responsibility* and added a hands-on project for the course *Economics of the Food Marketing System*.

The Environmental Planning and Design program was evaluated by a team from the Landscape Architectural Accreditation Board in spring 2013 and the Landscape Architecture option was successfully re-accredited. An application to

recognize the Landscape Architecture option as a distinct major (BSLA) is under review and we expect approval effective January 2013.

The Environmental Policy Institutions and Behavior program is undergoing a systematic reexamination of the entire structure and course sequence of the curriculum, a process that started, appropriately enough, with a thorough redefinition of the program learning goals.

The Research option in the Food Science program was evaluated by the IFT Higher Education Review Board and recognized as an approved IFT undergraduate program.

The Meteorology program made several curriculum changes in response to specific assessment data: Converted a fall/spring 1.5-credit course sequence into one 3-credit fall course. Added a 200-level course in computational methods. Modified both the minor and major requirements to reflect these course changes. Relaxed the chemistry requirement from two courses (fall/spring general chemistry sequence) to one course (fall general chemistry).

The Dietetics option in Nutritional Sciences was evaluated by a team from the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Dietetics and Nutrition in spring 2013. This review resulted in re-accreditation of the program for seven years.

The Plant Science program has recently rewritten learning goals for two of its three options: Horticulture and Turf Industry, and Horticultural Therapy.

Faculty of the School of Environmental and Biological Sciences submitted 19 courses for approval to satisfy Core Curriculum learning goals of the School of Arts and Sciences during AY 2012-13; 14 of these applications were approved, two rejected, and three are currently under review. In the previous academic year only three SEBS courses were submitted and approved to satisfy SAS learning goals. There are thus a total of 17 SAS Core Curriculum-approved courses offered by the School with three applications currently under review; at the end of AY 2011-12 there were only three such courses. These courses are, of course, assessed for their ability to meet delivery of the specific Core Curriculum learning goal(s) each time they are offered. We will continue to encourage SEBS faculty to prepare additional course approval applications to SAS in the coming year.

The critical first element in any academic assessment process involves defining specific and testable learning goals. It is thus the expectation of SEBS academic administration that EVERY course offered through the School include well-defined learning goals which are displayed prominently on the course syllabi. In an effort to encourage that process, and to enhance the overall academic impact of courses taught at the School, the Program in Science Learning has developed the Shared Teaching and Assessment Tools (STAT) Program (<http://sciencelearning.rutgers.edu/stat.html>). This effort, developed out of a systematic review of the literature on effective educational practice, has the following goal (see website): "By adopting parallel teaching and learning approaches in most of our classes, students and faculty can enjoy a sense of

educational culture.” Becoming “STAT certified” course involves four elements: use of a STAT syllabus; regular use within the course of any three of the five STAT educational task categories of: opportunities for conceptual reflection, opportunities to practice, formative assessment, establishing a framework for understanding, and practicing writing and research skills. (See site above for details about these elements.) In addition to other information, the STAT syllabus is explicitly structured to emphasize the importance of learning goals within each course.

The final element in assessment involves a regular and timely evaluation of whether learning goals are being met in individual courses. This evaluation remains the primary deficiency within our School-wide program of assessment. The primary responsibility for such assessment resides, of course, with individual faculty, with oversight provided by the program Assessment Committees under the leadership of the undergraduate program directors. We will work closely with these oversight groups throughout the coming year to ensure that such assessment becomes the norm at the School.

School Assessment

This process of learning-goal based course assessment will be systematically encouraged by current efforts at the School to redefine the general education requirements for graduation to match the current SAS learning goal-based Core Curriculum approach. A committee of faculty and students, under the leadership of Dr. Peter Strom, examined this issue beginning in fall 2011. Their report, submitted in early fall 2012, recommended that SEBS adopt the SAS learning goals with some subtle but real modifications: retain the current requirement for a junior/senior colloquium course; retain the current requirement for experience-based education; include a requirement for economic systems competence; require biology for all graduates; not include a historical analysis requirement; reduce Arts and Humanities requirement to one course. This recommendation was discussed and modified by the School’s Committee on Educational Policy during the fall and early spring semesters in AY 2012-13, formulated as a specific set of learning goals for the School and discussed extensively at two meetings of the SEBS Academic Forum in late spring semester. We expect a final decision on a learning-goal based core curriculum by early fall 2013.

The final list of SEBS Core Curriculum learning goals is expected to resemble the SAS list closely. Most learning goals will be identical, sufficiently such that approval of a course for that learning goal at one school will suffice for approval at the other, but also include a smaller subset of learning goals that are unique to SEBS. These unique goals will, of course, need to be approved by an SEBS committee.