

SECTION XIII: SUMMARY – PROGRAM STRENGTHS

A. List and describe the program’s major strengths, as detailed at the end of each section of this review, or in the program’s external report (accreditation, approval, or certification).

SECTION	AREA OF STRENGTH
I	Not Applicable
II	<p>Core Values Addressed in this Program: Student Engagement, Personal and Professional Growth, Access and Opportunity, Excellence.</p> <p>Strategic Goals Addressed in this Program: Develop a comprehensive urban campus in downtown Lawrence, Improve Student Career Preparation</p>
III	Not Applicable
IV	Solid Foundation in the Liberal Arts
V	Faculty are highly qualified, excellent teachers with total content mastery, with many having research experience and at least one involved in an active collaborative research program with extensive scientific publication.
VI	All of NECC’s Classes have been outfitted with a standardized high-quality projection systems. Two new biology labs have been built at the Lawrence campus. The Haverhill campus physics lab has been renovated.
VII	Statistically significant improved graduation rates and a statistically significant increase in the total numbers of students entering the program.
VIII	N/A
IX	Significant institutional energy has been invested in assessment in LA: Biology.
X	Many transfer agreements exist for Liberal Arts Biology graduates throughout the region with one international agreement.
XI	N/A
XII	N/A

SECTION XIV: SUMMARY – PROGRAM CHALLENGES AND AREAS FOR IMPROVEMENT – ACTION PLANS

A. List and describe the program’s major challenges and areas for improvement detailed at the end of each section of this review, or. For each challenge, describe the action recommendation, as well as the individuals responsible for implementation.

SECTION	CHALLENGE - AREA FOR IMPROVEMENT	ACTION RECOMMENDATION – INDIVIDUAL(S) RESPONSIBLE
I	Not Applicable	
II	<p>Challenges for College’s Core Values in this Program:</p> <p>a. Collaboration – Active biologists, potential students and their families, current students, and those with general interest in biology, have no official NECC web access to the NECC biology department and their faculty. This is in part due to the inability of members of NECC’s science department to come to consensus with those in charge of NECC’s webpage, and lack of institutional support in this matter. Professional colleagues outside of NECC have stated that they are unable to locate NECC faculty members, even after extensive internet searches for them. Thus, those outside are unable to follow the scientific advancements in which NECC biology faculty may be involved, limiting potential contacts and collaboration.</p>	<p>a. Collaboration – Departmental website necessary so that NECC faculty may foster collaborations outside of NECC. Institutional support will be required so that a departmental webpage is established that meets the following NECC science faculty driven requirements:</p> <ol style="list-style-type: none"> 1. Linked to NECC within 1 level of the homepage in a link entitled "Natural Sciences Department" 2. Academically driven, with content under direct control of the natural science department 3. Listing of natural sciences programs with links to: <ol style="list-style-type: none"> a. Descriptions of programs of study, b. course descriptions, c. course outcomes, d. descriptions of what can be done with that degree & department alumni, e. articulation agreements 4. Faculty profiles and links to faculty webpages 5. Facilities Link to show students lab space, and field research stations (e.g. Quarrybrook) 6. NECC science activity outside the classroom 7. What's new in our department? 8. Current science news <p>b. Personal and Professional Growth</p>

b. Personal and Professional Growth – Biology Science Faculty members who wish to continue with the business of actual science (i.e., research) face undue burden. This assessment is based upon excessive teaching requirements, lack of allocated research space on campus, and lack of financial incentive to pursue professional publication or rank advancement. Professional publications from Ph.D. science faculty in refereed journals are grossly undervalued and have been largely disregarded by the non-science NECC Community at Large. An important part of NECC’s mission is to be ‘a comprehensive center of educational excellence’ (as stated in NECC’s mission statement). This goes hand in hand with the stated mission of The Liberal Arts/Biology Program ‘to prepare students for further study towards the bachelor’s degree in biology by providing coursework and laboratory experiences in biology and other natural sciences, ...’ Disincentive for biology faculty to have an active ongoing research program minimizes the true science to which we are able to expose our LA: Biology students. This deprives them of critical exposure to actual (vs. contrived in a lab exercise) practice of the scientific method, develop critical thinking skills, and the potential to be included as junior authors in scientific publication and deliver presentation at scientific meetings.

Challenges for Strategic Goals in This Program:

Goal 2: Improve Student Learning, and Retention and Graduation Rates. Retention, graduation and transfer rates for this group are as follows:

2003-2007

- Average Total students enrolled in program = 47
- Average Retention Rate from previous Fall = 46%
- Average Graduates per year = 1
- Graduation Rate = 2.5%
- Average 4 year transfers per year = 7
- Percent Transfers = 16%

2008- 2011

- Average Total students enrolled in program = 93
- Average Retention Rate from previous Fall = 49%

– provide science faculty with support and incentive for professional scientific growth through several means including: financial support of research projects in terms of up to 1 course release per semester, recognition and celebration of scientific publication, and continued support for faculty to attend scientific conferences and join professional societies.

Challenges for Strategic Goals in This Program:

Goal 2: Several years ago a LA: Biology support group was proposed and a pilot meeting was held. LA: Biology students in attendance voiced overwhelming support for this. It is recommended that the role of Program Coordinator be re-activated, in part to facilitate a support group for NECC’s students focused on a career in the biological sciences.

An A.S. Program in Biological Sciences will be proposed to replace the Liberal Arts: Biology option, that has prerequisite Admission Criteria of college level reading, writing and math skills. This new program would introduce 4 options that would allow students to begin their biology focus early in their academic careers, saving them valuable time later in their educational track. The options include: PreMed/PreVet;

	<p>Average Graduates per year = 3 Graduation Rate = 3.5% Average 4 year transfers per year = 14 Percent Transfer = 16%</p> <p>This low rate of graduation, even though increased after 2007, coupled with a 16% transfer rate, is reflective of the fact that many students initially enter the program, but do not complete it. The retention rates have increased slightly (though insignificantly in a practical sense), but remain below 50%. The percentage of students transferring to 4-year colleges has remained consistent since 2003.</p> <p>Many factors contribute to this including lack of preparation upon arrival, difficulty in completing the program requirements in reasonable time (such as course under enrollment/unavailability), and early transfer. A more structured predictable program will help to increase retention rates and to increase graduation before transfer.</p> <p>When students graduate with an LA:Biology degree, they lack Organic Chemistry, which is a normal 2nd year-long requirement in B.S. Biology Programs.</p>	<p>Cell/Molecular; Ecology/Evolution/Behavior; Marine. All students will be required to take two semesters of Introductory Biology for Majors (requiring two new course offerings), General Chemistry I & II, English Composition I & II, two semesters of math (Calculus I/II or Statistics/Calculus for Business), and College Physics I/II. Their electives will include a suite of open electives and 8-12 credits of biology electives that would be geared specifically toward their chosen track (PreMed/PreVet – Human Anatomy & Physiology I & II) (Cell/Molecular - Cell Biology and Molecular Techniques [a new course]) (Ecology/Evolution/Behavior – Ecology, Animal Behavior [a new course]) (Marine – Marine Biology, Invertebrate Biology [a new course] or Animal Behavior [a new course] or Ichthyology [a new course].</p>
III	<p>There is no official departmental mechanism to communicate the Liberal Arts: Biology students as a group on a regular basis. Several fruitless attempts to develop an independent departmental website have occurred.</p>	<p>Development of departmental website (as described above) that is easily accessible from the NECC front homepage, whose content and look is under the independent control of the Department of Natural Sciences.</p>
IV	<p>Core biology courses are populated mostly by non-majors.</p> <p>Ability of Liberal Arts: Biology majors to take only 1 elective.</p> <p>Lack of actual attractive electives that are actually taught.</p>	<p>Develop a two semester major's general biology course sequence. These new courses would be more biologically rigorous than BIO 111/112, as well as concept & inquiry based with a 3 (vs. 2) hour lab component.</p> <p>Change program requirements / replace with A.S. in Biology.</p> <p>Better offering of electives suitable for biology majors. Introduce A.S. in</p>

		Biology with several tracks having mandatory biology courses as previously described.
V	Recently retired full time faculty in the biological sciences has not been replaced; There are increasing course offerings at Lawrence campus and few full time faculty on that campus to teach these courses;	Replace retired faculty member; Hire a full time faculty member for biology at Lawrence campus;
VI	Haverhill labs are outdated. The Natural Sciences budget is inadequate.	Implement the planned renovations to the Haverhill biology labs. Increase the science budget to realistic levels required to provide modernized instruction to NECC's Liberal Arts: Biology students.
VII	No formal retention policies exist & student graduation rates are still low. No Biology Program Coordinator exists.	Program Coordinator should be re-instated: this person would be responsible to work with Biology Faculty, Science Administrators & NECC Advisors to help develop formal retention polices to help improve graduation rates. Re-examine suggestions of the previous program review. Appoint a Biology Program Coordinator from full time biology faculty.
VIII	N/A	
IX	Need for acceptable comprehensive assessment tool still exists.	Recommendations are to continue to investigate and develop a concept inventory acceptable to all faculty members involved in the teaching/assessment of BIO 111/112.
X	N/A	
XI	N/A	
XII	N/A	