THE
UNIVERSITY
OF RHODE ISLAND
FACULTY SENATE OFFICE
Green Hall, 35 Campus Avenue, Kingston, RI 02881 USA p: 401.874.2616

THINK BIG WE DO

Serial Number #18-19-17C

TO: President David Dooley
FROM: Hillary Leonard, Chairperson of the Faculty Senate

1. The attached BILL titled, the Curriculum and Standards Committee Report #2018-19-8: Bachelor of Science in Biotechnology degree program, is forwarded for your consideration.

2. This BILL was adopted by vote of the Faculty Senate on February 21, 2019.

3. After considering this bill, will you please indicate your approval or disapproval. Return the original, completing the appropriate endorsement below.

4. In accordance with Section 10, paragraph 4 of the Senate's By-Laws, this bill will become effective March 14, 2019, three weeks after Senate approval, unless: (1) specific dates for implementation are written into the bill; (2) you return it disapproved; or (3) the University Faculty petitions for a referendum.

Hillary Leonard
Chairperson of the Faculty Senate

February 21, 2019

ENDORSEMENT

TO: Chairperson of the Faculty Senate

FROM: President of the University

a. Approved ___.

b. Approved subject to Notice of the Council on Postsecondary Education __X__.

c. Disapproved ___.

David M. Dooley, Ph.D
President

March 7, 2019

THE UNIVERSITY OF RHODE ISLAND

FACULTY SENATE OFFICE

THINK BIG WE DO™

UNIVERSITY OF RHODE ISLAND FACULTY SENATE
February 21, 2019

Faculty Senate Curriculum and Standards Committee
Report 2018-2019-8

At the February 7, 2019 meeting of the Curriculum and Standards Committee, the following matters were considered and are now presented to the Faculty Senate.

SECTION II
Curricular Matters Which Require Confirmation by the Faculty Senate

PROGRAM CHANGES:

COLLEGE OF ENVIRONMENT AND LIFE SCIENCES:

Department of Cell and Molecular Biology:
Create a new BS degree and major in Biotechnology:
The Department of Cell and Molecular Biology confers BS degrees in two majors, Cell and Molecular Biology (CMB) and Medical Laboratory Science (MLS). Each program currently offers independent biotechnology tracks/concentrations for students to follow. The new Biotechnology major will merge these two tracks into a single, stronger, more visible and more efficiently administered undergraduate program leading to a BS degree. Course requirements will be consolidated and modified from the two existing biotechnology tracks/concentrations. Courses common to both existing tracks (100 credits in common) will provide the core course offerings within the new major. Two new courses, an introductory biotechnology course and a second course on drug discovery and development in industry, will be developed to support the new major. The Biotechnology degree will provide preparation and training in research and development, biotechnology operations, quality assurance and regulatory affairs for this economically important industry.

THE UNIVERSITY OF RHODE ISLAND

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Academic Program Proposal Cover Page

1. Name/Contact Information: Gongqin Sun/Ed Bozzi 401-874-5937/401-277-5212

2. Originating from (please fill in all that apply):

CMB	ELS	
(Department)	(School/College)	(Division)

3. Program type: Undergraduate ☑ (attach Curriculum Sheet) Graduate ☐ (attach List of Requirements)

4. Proposing **New** ☑ or **Change** ☐ to the following (see **Instructions** for definitions): (select all that apply)

Department: ☐ Degree: ☑ Program: ☐ Major: ☑ Sub plan: ☐ (option, track, concentration) Other: ☐

Title/name of proposed Department:

Title/name of proposed Degree: Biotechnology

Title/name of proposed Program:

Title/name of proposed Major: Biotechnology

Classification of instruction program (CIP) code: CIP Index 26.12

Title/name of proposed Sub plan:

CIP code (if different from above): CIP Index

Other:

5. Proposed Degree(s) (BS, BA, BFA, MA, MS, Ph.D, etc.): BS

6. Intended initiation date: Term Fall Year 2019

7. Anticipated date of granting first degree: May, 2023

8. Intended location of program: Kingston ☑ Providence ☑ Narragansett Bay Campus ☐

9. Total Credits Required for Graduation: (120, 130, etc) 120

10. Certification/Licensing Requirements: Yes ☐ (provide brief description) No ☑

Office Use Only:
College Curriculum Committee _____ Curricular Affairs Committee _____ Graduate Council _____
Faculty Senate _____ President _____ RIBGHE _____ Enrollment Services _____

THE
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OF RHODE ISLAND

THINK BIG WE DO

Joint Committee on Academic Planning Pre-Proposal for New Programs

Program Name: Biotechnology

Degree Type: Bachelor of Science

Proposer: Joel Chandlee/ Edward Bozzi

Department(s): Cell and Molecular Biology

College(s): Environment and Life Sciences

Part 1. Briefly describe program. Currently, the Department of Cell and Molecular Biology confers BS degrees in two majors, Cell and Molecular Biology and Medical Laboratory Science. Each program offers independent biotechnology tracks/concentrations for students to follow. The new Biotechnology Program will consolidate these two tracks into a stronger, more visible undergraduate program leading to a BS degree. This program will provide preparation and training in research and development, biotechnology operations, quality assurance and regulatory affairs for this economically important industry. Course requirements will be consolidated and modified from the two existing biotechnology tracks/concentrations. The new major will emphasize experiential learning, through hands-on laboratory experiences and internships. URI's Providence Campus plays a key role in delivering this new major, providing laboratory resources unavailable in Kingston and proximity to most of the biotechnology companies/organizations that have historically offered internships. The degree program offers career opportunities in industry and academia in both research and development. Students completing this major will find ample opportunities for employment in the rapidly growing biotechnology industry centered in large part in nearby Massachusetts where 68,000 are currently employed. Growth in MA over the next 5 years is expected to require an additional 10,000 employees. Rhode Island will also experience employment growth. Amgen is investing $160 million in a new West Greenwich facility that will employ 150 additional personnel and Cambridge, MA based Rubius plans on investing $150 million in new N. Smithfield facilities. In addition to immediate employment opportunities, the major also prepares students for further education in graduate and professional programs.

Part 2. How does the program connect to the mission of the University and the strategic themes and goals of the Academic Plan 2016-2021?

Throughout the Academic Plan, there is an emphasis on providing experiential learning opportunities. The extensive laboratory experiences and 12-credit internship requirements for this major help the student to achieve this goal (Goals 1,2; Academic Plan). The existing biotechnology track/concentration for the Medical Laboratory Science Program has historically attracted a diverse group of students, many coming from disadvantaged backgrounds. With its strong employment potential, it is expected that the new major will continue to be of interest to disadvantaged students and serve to attract them in even larger numbers (Goal 4; Academic Plan). In the past, many of the internships have been with small biotechnology startups in the immediate area. Biotechnology students assist these firms with research capabilities at modest costs. Successful interns are usually able to secure part-time positions at these RI-based companies and contribute strongly to their success (Goal 2; Academic Plan). Current Providence-based biotechnology students receive enhanced advising with instructor offices located within the dedicated classroom. This close student/instructor relationship, with increased student

numbers, will continue with development of the new major (Goal 1; Academic Plan). The 12-credit summer internship provides students with enough credits potentially to graduate one semester early, thereby enhancing degree completion rates (Goal 1; Academic Plan). Lastly, because many biotechnology companies are international, students have opportunities for international travel and employment (Goals 2,3; Academic Plan).

Part 3. Signatures

Proposer: _____ Date: 8/16/18

Chair(s): _____ Date: 8/16/18

Dean(s): _____ Date: 7/9/18

JCAP Review Committee Response: Date: _____10__11__2018_____

__XX_ We urge you to move the proposal forward for further development

____ We urge you to re-consider the proposed program

Comments:

The committee voted unanimously that the degree plan is encouraged to move forward, with the following important feedback:

- Succession planning needs to be considered and supported in the proposal as it goes forward.
- The Experiential Learning Center can help with institutionalizing internships, which are critical to this degree.

THE
UNIVERSITY
12 / 2016
OF RHODE ISLAND

Revised

Abbreviated Proposal form
For All Programs including Certificates
No New Funding

A Proposal for: UNDERGRADUATE MAJOR IN BIOTECHNOLOGY

Date: September, 2018

A. PROGRAM INFORMATION

A1. Name of institution University of Rhode Island

A2. Name of department, division, school or college

Department: Cell and Molecular Biology
College: Environment and Life Sciences

A3. Title of proposed program and Classification of Instructional Programs (CIP) code

Program title: Bachelor of Science in Biotechnology

Classification code (CIP):

26) Biological and Biomedical Sciences
26.12) Biotechnology

A4. Intended initiation date of program change. Include anticipated date for granting first degrees or certificates, if appropriate.

Initiation date: September, 2019
First degree date: May, 2023

A5. Intended location of the program

Providence Campus and Kingston Campus

A6. Description of institutional review and approval process

		Approval Date
Department		12/11/18
College		
CAC/Graduate Council		
Faculty Senate		
President of the University		

A7. Summary description of proposed program (not to exceed 2 pages)

The Department of Cell and Molecular Biology confers BS degrees in two majors, Cell and Molecular Biology (CMB) and Medical Laboratory Science (MLS). Each program currently offers independent biotechnology tracks/concentrations for students to follow. The new Biotechnology major will merge these two tracks into a single, stronger, more visible and more efficiently administered undergraduate program leading to a BS degree. Course requirements will be consolidated and modified from the two existing biotechnology tracks/concentrations. Courses common to both existing tracks (100 credits in common) will provide the core course offerings within the new major. Two new courses, an introductory biotechnology course and a second course on drug discovery and development in industry, will be developed to support the new major. The Biotechnology degree will provide preparation and training in research and development, biotechnology operations, quality assurance and regulatory affairs for this economically important industry.

The existing Biotechnology Manufacturing track within the MLS degree program currently has approximately 50 declared students, while the Biotechnology track within the CMB degree program currently has 10 students. We expect these numbers to grow significantly within the new major because of greater visibility. For example, the Common Application that high school seniors complete for admittance to URI informs potential students of all majors offered through URI. As such, biotechnology is not currently listed. Students with an interest in this field find out about it only after some time is spent pursuing other degree requirements. With biotechnology as a major, potential URI students will be able to select Biotechnology as a major at the beginning of their academic career. Another important development that will increase student interest in and awareness of this new major is the growing Amgen Biotechnology Experience (ABE), a high school program, administered by URI Providence. As more New England high schools participate in this program, increasing numbers of high school students will practice biotechnology at their schools and may choose to continue that education at URI.

Nationwide, the biotechnology industry has 1.74 million employees and since 2001 has added 273,000 jobs for a 19% growth rate. Students completing this major will find ample opportunities for employment in the rapidly growing biotechnology industry centered in large part in nearby Massachusetts where 68,000 are currently employed. Growth in MA over the next 5 years is expected to require an additional 10,000 employees. Rhode Island will also experience employment growth. Amgen is

investing $160 million in a new West Greenwich facility that will employ 150 additional personnel and the Cambridge, MA company Rubius plans on investing $150 million in new N. Smithfield facilities.

There will be no need to increase the number of instructors for this new major as existing faculty already support delivery of the two separate biotechnology tracks. Instructors at URI Providence now teaching students in the Biotechnology Manufacturing track will continue to provide instruction to students in the new major. Similarly, there would be no need to increase capabilities in Kingston.

The JCAP committee voted unanimously that this degree program should move forward. In addition, they suggested that we consider engaging the Career and Experiential Learning center to assist with institutionalizing the internship commitments in the program. These discussions are underway. Also, they suggested developing a succession plan for the current academic coordinator who is looking at retirement some five years down the road. As both the CMB faculty in Kingston and Providence are committed to the success of this new program, discussions have begun regarding strategies for recruitment of a program coordinator for the future either internally or externally.

A8. Signature of the President

_____
David M. Dooley

A9. Person to contact during the proposal review

Name: Gongqin Sun / Edward Bozzi
Title: Professor and Chair / Clinical Professor
Phone: 401-874-5937 / 401-277-5212
Email: gsun@uri.edu / ebozzi@uri.edu

A10. List and attach any signed agreements for any cooperative arrangements made with other institutions/agencies or private companies in support of the program.

None

B. RATIONALE: There should be a demonstrable need for the program.

B1. Explain and quantify the needs addressed by this program, and present evidence that the program fulfills these needs.

B2. What is the economic need and workforce data related to the program?

The biotechnology industry is rapidly growing and in need of employees skilled and knowledgeable in this science both in the US and internationally. The proposed program can address this need by providing properly trained graduates in this field. Within New England, the Boston/Cambridge area is the global center for biotechnology in the world. In addition, firms such as Amgen, Sanofi-Genzyme, Shire and Organogenesis have substantial production sites in Rhode Island and Massachusetts. Past graduates of the Biotechnology Manufacturing track within MLS have had little problems in finding employment in the area. Amgen in West Greenwich announced recently that they would be expanding production capabilities at this site and employing an additional "150 highly skilled manufacturing employees". In addition, Commerce RI is working with new a biotechnology firm, Rubius Therapeutics, who expects to invest $150 million to renovate the Alexion site in Smithfield, RI. We would expect graduates of this new degree program to enjoy similar employment opportunities. While most biotechnology firms require new employees to hold bachelor degrees, they give preference to those with degrees specifically in biotechnology. In nearby Massachusetts, Mass Bio, a trade organization, reports 1177 job vacancies in Massachusetts at this time. Many of these job opportunities can be fulfilled with a degree in Biotechnology.

Today's students are keenly interested in internships and the experiential learning they provide. The biotechnology program will require students to complete a twelve-credit internship course at either a biotechnology firm or organization. In lieu of an internship, the program includes a list of courses from which students can select to fulfill the twelve-credit requirement. While Rhode Island has only one major biopharmaceutical firm (Amgen), it does have many start up and small biotech companies. Interns are important for these firms since they provide low cost but effective manpower. The 2013 enacted legislation, Innovate RI, reimburses these small firms for the cost of employing biotechnology students.

B3. Provide information on jobs available as a result of successfully completing the certificate or degree: job titles, job outlook/growth, and salaries.

Jobs for graduates vary from technicians in process development and quality control laboratories to production associates. All of these opportunities will grow substantially as the industry expands. In 2016, the USA based industry employed 1.74 million and grew 19% since 2001. The average biotechnology employee in the USA earned $99,000 in 2016. Locally, graduates of URI's Biotechnology Manufacturing track are typically earning about $50,000/year in their first year of employment. Salaries advance rapidly thereafter. Graduates employed in startups and small biotechnology firms earn less but may have greater potential. Non-profit and academic positions pay typically in the $35,000-45,000 range. Job movement from company to company is common. Many graduates earn six figure salaries after a couple of such moves.

C. INSTITUTIONAL ROLE: The program should be clearly related to the published role and mission of the institution and be compatible with other programs and activities of the institution.

C1. Explain how the program is consistent with the published role and mission of the institution and how it is related to the institution's academic planning.

One emphasis of this program will be hands-on learning in both laboratory classes and internships. This approach to learning is very consistent with the President's Transformational Goals. In fact, students in this major will have laboratory classes multiple times per week during their first and second years. The internships, with historical placement at nearly 100% in the Biotechnology Manufacturing track, often lead to part-time employment for the student at the host company that continues until graduation. This again meets a Transformational goal of providing the student with experiential learning. With many of the internships at start-up firms, student internships provide companies with economical, committed and skilled employees. These start-up and small Biotechnology firms have been involved with the Biotechnology Manufacturing Program for many years. Graduates of the Biotechnology Manufacturing track typically find employment with large, global biopharmaceutical companies that provide opportunities for international experiences, again meeting a Transformational goal. We would expect students majoring in Biotechnology to receive enhanced advising and guidance, as is currently the case in the Biotechnology Manufacturing track. Students in this track attain the 120 credits needed for graduation in only three and one-half rather than four years.

D. INTER-INSTITUTIONAL CONSIDERATIONS: The program should be consistent with all policies of the Council on Postsecondary Education pertaining to the coordination and collaboration between public institutions of higher education.

D1. Estimate the projected impact of this program on other public higher education institutions in Rhode Island (e.g. loss of students or revenues), provide a rationale for the assumptions made in the projections, and indicate the manner in which the other public institutions were consulted in developing the projections. Have you communicated with other institutions about the development of this program and have any concerns been raised related to role, scope, and mission or duplication.

CCRI and URI have an articulation agreement for Biotechnology. Students at CCRI completing their 18-credit Biotechnology certificate program can transfer to URI with all 18 credits accepted for the Biotechnology Manufacturing track. We would expect the same acceptance for the new Biotechnology major. While Rhode Island College may be impacted, during the last ten years only few RIC students have sought to enter URI's Biotechnology Manufacturing track and, therefore, we have not contacted RIC concerning this new major.

D2. Using the format prescribed by the Council on Postsecondary Education, describe provisions for transfer students (into or out of the program) at other Rhode Island public institutions of higher education. Describe any transfer agreements with independent institutions. The institution must also submit either a Joint Admissions Agreement transition plan or the reason(s) the new program is not transferable (see ***Procedure for Strengthening the Articulation/Transfer Component of the Review Process for New Programs***).

The proposed program builds on exiting program tracks (CMB/Biotechnology and MLS/Biotechnology Manufacturing) that have long-standing transfer agreements in place. The two new proposed courses (CMB 1XX and CMB 4XX) in the proposed program are so specific in content to support the new degree that equivalent courses are not taught at other Universities/Colleges in Rhode Island. In all cases, as is current policy, every effort will be made to ensure transfer of equivalent courses and associated credits when a transcript from another institution is evaluated.

D3. Describe any cooperative arrangements or affiliations with other institutions in establishing this program. (Signed copies of any agreements pertaining to use of faculty, library, equipment, and facilities should be attached.)

No such agreements are currently in place for the two existing Biotechnology tracks and are not needed for the new degree program.

D4. How does this program align to academic programs at other institutions?

The following compilation serves as a representative cross-section of 4-year degree offerings from New England states. In addition, some institutions offer certificates in biotechnology to compliment a BS degree in life sciences.

University of New Hampshire

UNH offers a BS degree in Biotechnology at their Manchester Campus. "Exploring topics like biochemistry, molecular biology and genetics, our Biotechnology Program puts you at the heart of one of the newest and fastest growing scientific fields." The last year of this program features a capstone internship while earlier years require life sciences courses similar to URI's proposed program.

Northeastern University

Northeastern University asks the question "Why Biotechnology" on their web page. In response, "Whether your interest lies in R + D, manufacturing, testing or QA, a BS degree in Biotechnology can help you on your way". Biotechnology is "one of the region's most exciting and fastest-growing industries." Their program seems to stress biomanufacturing with courses such as: Biotechnology processing, quality control and validation and biomaterials. Their cooperative education program provides students with important work and internship opportunities in this field.

Worcester Polytechnic Institute

WPI offers a BS degree in Biology and Biotechnology. They define biotechnology as: "the technological application of biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use". Their curriculum contains courses not only in biology and chemistry, but courses with significant laboratory experience. There is, however, no evidence of an internship requirement for graduation.

University of New Haven

The University of New Haven offers a joint Genetics and Biotechnology BS degree that "prepares students to enter the growing genetics, biopharmaceutical and biotechnical fields." Students seem to have freedom to select core courses from a wide array of science and mathematical courses. Their curriculum includes internship opportunities and significant interactions with biotechnology employees.

Assumption College

"Students who declare a Biotechnology major take 17 required courses in biology, chemistry and physics and are strongly encouraged to take a 300-level course in ethics". Assumption College has a strong commitment to internships by stating that "3 elective sciences courses are needed; 2 of which can be internships". In addition the BS degree Biotechnology curriculum follows the Molecular Biology pathway closely.

Certificate Programs in Biotechnology (In Addition to BS Life Science Degree)

University of Massachusetts-Amherst

"A certificate program in Biotechnology will prepare students to meet and exceed the expectations of this growing industrial base. The certificate program requires students take a minimum of 15 credits in approved courses covering topics in the area of Biotechnology". A key component of this program is hands-on-laboratory experience for students that can be obtained via a laboratory based independent study or internships. The administration of the program is the responsibility of the Department of Microbiology.

Roger Williams University

"Biology, Environmental Science, Marine Biology or Chemistry majors will be eligible for a Certificate in Biotechnology by having a 3.0 GPA, filing an application, completing courses and completing an internship/research project." Students also have to pass a comprehensive content and laboratory skills test.

Community College of Rhode Island

CCRI offers an 18-credit certificate in Biotechnology which can be earned concurrently with an associate's degree in a science or independently without a degree. Courses include: Biology, Chemistry, Microbiology and Biotechnology. Many students

completing this program transfer to URI's Biotechnology Manufacturing track to complete the BS degree. Most courses in the certificate program are accepted by URI for credit.

D5. Are recipients of this credential accepted into programs at the next degree level without issue?

Students graduating with degrees in MLS/Biotechnology Manufacturing have gone on to MS and PhD programs and professional medical programs (ie, Medical School, Physician Assistant). A similar situation would exist with the new major.

D6. How does this program of study interface with degree programs at the level below them?

Students graduating community colleges with Associate Degrees in either the sciences or liberal arts have entered the MLS (Biotechnology Manufacturing track) program with no problems. I would expect a similar situation with this new major.

D7. If external affiliations are required, identify providing agencies. (Indicate the status of any arrangements made and append letters of agreement, if appropriate.)

None required with this new major.

D8. Indicate whether the program will be available to students under the New England Board of Higher Education's (NEBHE) Regional Student Program (RSP).

No.

E. PROGRAM: The program should meet a recognized educational need and be delivered in an appropriate mode.

NOTE: Once the new degree is approved, students currently in the existing Biotechnology tracks within the CMB and MLS majors will be given the option to graduate under their existing plan or transfer to the new degree program. No new students will be admitted to the existing Biotechnology tracks and the tracks will be eliminated once all enrolled students are graduated.

E1. Prepare a typical curriculum display for one program cycle for each sub-major, specialty or option, including the following information:

See Appendix 1 for curriculum display and Appendix 6 for the Program Library Impact Statement.

a. Name of courses, departments, and catalog numbers and brief descriptions for new courses, preferably as these will appear in the catalog.

CMB 110 Introduction to Biotechnology (4 cr)

CMB 405 Drug Discovery and Development (3 cr)

See Appendix 2 for course proposals.

b. Are there specializations and/or tracks/options/sub-plans/concentrations? If so, describe required courses in area of specialization or tracks/options/sub-plans/concentrations.

No.

c. Course distribution requirements, if any, within program.

I. General Education Requirements – at least 40 cr
II. Pre-Professional and Basic Sciences – 39 cr (some fulfill Gen. Ed. requirements)
III. Professional Courses – 40 cr
IV. Free Electives – up to 12 cr

d. Total number of free electives available after specialization requirements are satisfied.

N / A

e. Total number of credits required for completion of program or for graduation. Present evidence that the program is of appropriate length as illustrated by conformity with appropriate accrediting agency standards, applicable industry standards, or other credible measure, and comparability of lengths with similar programs in the state or region.

120 credits required for graduation.

f. Identify any courses that will be delivered or received by way of distance learning (refer to ***Policy on Distance Learning, Council on Postsecondary Education, State of Rhode Island and Providence Plantations***).

The program is not designed to be delivered or received by distance learning.

g. Is the program content guided by program-specific accreditation standards or other outside guidance?

No.

E2. Describe certification/licensing requirements, if any, for program graduates and the degree to which completion of the required course work meets said requirements. Indicate the agencies and timetables for graduates to meet those requirements.

None.

E3. Include the learning goals (what students are expected to gain, achieve, know, or demonstrate by completion of the program) and requirements for each program.

Learning Goals

- Possess knowledge and skills. Integrate scientific knowledge and laboratory skills
- Be problem solvers. Demonstrate the ability to evaluate the scope of a complex problem and propose a solution.
- Be effective communicators. Develop appropriate effective communication skills in order to provide results to varied audiences
- Work on teams. Apply the necessary personal and professional skills to be successful within a team-based environment.

Beyond meeting general educations learning goals set by URI, students will be expected to have the following knowledge equivalents (passing grade or better):

- Biology: BIO 101,102,103,104,341,352
- Chemistry: CHM 101,102,112,114,124,126
- Physics: PHY 111,185
- Math: MTH 103 or 111 and 131; alternatively, MTH 131 and STA 307
- Core Courses: CMB 110,190,211,311,333,405,437; MLS 195,199

E4. Demonstrate that student learning is assessed based on clear statements of learning outcomes and expectations.

a. Learning Goals

The overarching learning goal of the Biotechnology curriculum is to provide students a unique education that is liberal in breadth, science-based, effective in personal and professional skills development, to prepare them for entry-level positions in biotechnology firms/organizations, graduate study, and for other positions where a problem-solving approach to issues in biopharmaceutical research and production is necessary.

We will achieve this through a focus on the goal areas below which will be achieved through a cohesive and rigorous curriculum designed with measurable student learning outcomes for all students.

1. Possess knowledge and skills
2. Be problem solvers
3. Be effective communicators
4. Work on teams

b. Demonstrate that student learning is assessed based on clear statements of learning outcomes and expectations.

See Appendix 3 - Assessment Plan, Curriculum Mapping and Student Outcomes

E5. Provide an assessment plan detailing what a student should know and be able to do at the end of the program and how the skills and knowledge will be assessed. Consult with the Office of Student Learning, Outcomes Assessment, and Accreditation (SLOAA) to prepare a Learning Outcomes Assessment Plan for student learning assessment. Following consultation, submit a final draft of the plan to the Chair of the Learning Outcomes Oversight Committee (LOOC) for approval by the full Learning Outcomes Oversight Committee.

See Appendix 3 for Assessment Plan from SLOAA and Appendix 4 for LOOC analysis and approval.

F. FACULTY AND STAFF: The faculty and support staff for the program should be sufficient in number and demonstrate the knowledge, skills, and other attributes necessary to the success of the program.

F1. Describe the faculty who will be assigned to the program. Indicate total full-time equivalent (FTE) positions required for the program, the proportion of program faculty who will be in tenure-track positions, and whether faculty positions will be new positions or reassignment of existing positions. What are the minimal degree level and academic/technical field requirements and certifications required for teaching in this program?

The faculty of Chris Pargellis and Ed Bozzi (0.5 FTE) along with lab manager Doreen Osgood currently support the MLS program Biotechnology Manufacturing track through several course offerings in Providence. Their efforts will be supported by course work and internship opportunities delivered by additional CMB faculty and personnel (J. Camberg, J. Chandlee, S. Gregory, A. Dutta, N. Greene, A. DeGroot, N. Howlett, B. Jenkins, A. Kausch, X. Lin, L. Martin, L. Moise, D. Nelson, K. Ramsey, M. Ramsey, A. Rothman, G, Sun and Y. Zhang).

G. STUDENTS: The program should be designed to provide students with a course of study that will contribute to their intellectual, social, and economic well-being. Students selected should have the necessary potential and commitment to complete the program successfully.

G1. Describe the potential students for the program and the primary source of students. Indicate the extent to which the program will attract new students or will draw students from existing programs and provide a specific rationale for these assumptions. For graduate programs, indicate which undergraduate programs would be a potential source of students.

There are currently 40 students in the MLS/Biotechnology track not including the 20 students who entered this track in September 2017 and are not yet coded for MLS/Biotechnology Manufacturing. In addition there are approximately 10 students in the CMB/Biotechnology track. We would expect all of these students to enter the new major. The Amgen Biotech Experience (ABE) Program is expanding from 17 to 20 RI high schools this year. We would expect more high school seniors, enjoying this program, to enroll in URI and select Biotechnology as their major, especially since it will be listed on the Common Application. Biotechnology is more so in the local news with the Rubius Therapeutics announcement of a new facility in Smithfield, RI, the Amgen plant expansion, the Wexford Innovation Center and the proposed BioHub facility in Providence. These activities are likely to increase visibility and should lead to more students majoring in Biotechnology. The new program will attract students from out of state as visibility increases. Finally, as education becomes more expensive, students and parents will be considering majors that can lead to careers. Biotechnology fits into this thinking as a preferred career goal.

H. EVALUATION: Appropriate criteria for evaluating the success of a program should be developed and used.

H1. List the performance measures by which the institution plans to evaluate the program. Indicate the frequency of measurement and the personnel responsible for performance measurements. Describe provisions made for external evaluation, as appropriate.

There are three criteria that will ultimately measure the success of the program: enrollment, graduation rate, and success of the graduates in the economic market place.

1) Enrollment. It would likely take 2 to 5 years of ramp-up time before we can judge if the program is successful in attracting students into it. Thus, fifth anniversary of the program's initiation would be a time to evaluate its enrollment success.
2) Graduation rate. Universities often use four-year and six-year graduate rate to measure the success of a program in graduating the students. The same criterion should apply to this program.
3) Success of the graduates from this track in the economic market place. This will be the ultimate measure of the program's success. We plan to track the career and employment of our graduates one year and five years after their graduation. Such information would provide a measure how well we attract and educate students in this track.

I. IS THE PROGRAM FINANCIALLY VIABLE?

I1. ALL PROPOSALS: Complete the Rhode Island Office of Postsecondary Commissioner Budget Form demonstrating that existing funds are sufficient for carrying out the program. The completed proposal with Budget Form requires review by the URI Budget and Financial Planning Office. Proposers shall request a Statement of No Financial Impact from the URI Budget and Financial Planning Office.

See Appendix 5a and 5b for budget analysis. Approval from the URI Budget and Financial Planning Office is pending.

Biotechnology - BS

THE UNIVERSITY OF RHODE ISLAND

Student: _____

Student ID: _____

Advisor: _____

120 Earned Credits Total

ABOUT THE BS in BIOTECHNOLOGY :

The Biotechnology major is designed to prepare students for professional careers in the biotechnology and biomedical industries in the areas of research and development, quality control, processing, operations, and technical support. This major requires some key courses to be taken at the Providence Campus. Included is a 12-credit internship at a regional biotechnology or biomedical company/organization.

Step 1: REVIEW YOUR PROGRAM REQUIREMENTS

INTRODUCTION Requirement: (2 credits)

Course	Semester	Credits	Grade
MLS 102		1	
URI 101		1	

BIOLOGY Requirement: (15 credits)

Course	Semester	Credits	Grade
*BIO 101		3	
*BIO 102		3	
*BIO 103		1	
*BIO 104		1	
BIO 352		4	
BIO 341		3	

CHEMISTRY Requirement: (12 credits)

Course	Semester	Credits	Grade
CHM *101		3	
CHM 102		1	
CHM 112		3	
CHM 114		1	
CHM 124		3	
CHM 126		1	

MATH Requirement: (6-7 credits)

Pick 2 of the following:

Course	Semester	Credits	Grad
*MTH 103/111		3	
and			
*MTH 131/141		3/4	
OR			
*MTH 131/141		3/4	
and			
STA 307/308/409		3	

PHYSICS Requirement: (4 credits)

Course	Semester	Credits	Grade
PHY 111		3	
PHY 185		1	

CMB and MLS Course Requirements: (40 credits)

Course	Semester	Credits	Grade
*CMB 190		3	
CMB 211		4	
CMB 311		3	
CMB 333		3	
CMB 437		3	
MLS 195		5	
MLS 199		12	
CMB 110		4	
CMB 405		3	

Suggested professional elective courses include:
CMB 320, CMB 334, CMB 421, CMB 432, CMB 435, CMB 450, CMB 464, CMB 482

FREE ELECTIVES: These are courses not required by the major and do not fulfill general education.

Course	Semester	Credits	Grade

*Courses approved for general education.

Consult with your advisor to determine the specific courses needed to meet the 120 credit graduation requirement.

Minimum 2.0 cumulative GPA required in major for graduation.

Effective : 2018-2019

THE UNIVERSITY OF RHODE ISLAND

Student: _____

Biotechnology

Student ID: _____

120 Earned Credits Total

Advisor: _____

General Education Guidelines:

General education is 40 credits. Each of the twelve outcomes (A1-D1) must be met by at least 3 credits. A single course may meet more than one outcome, but cannot be double counted towards the 40 credit total. At least one course must be a Grand Challenge (G). No more than twelve credits can have the same course code. General education courses may also be used to meet requirements of the major or minor when appropriate.

LIST COURSES THAT MEET GENERAL EDUCATION:

General Education Credit Count						
At least 40 credits, no more than 12 credits with the same course code						
Course	**Credits**	**Grade**		**Course**	**Credits**	**Grade**
*BIO 101	3					
*BIO 103	1					
*BIO 102	3					
*BIO 104	1					
*CHM 101	3					
*MTH ____						
*PHY 111	3					
*PHY 185	1					
*CMB 190	3					
				Total Gen Ed Credits		

NOTE: BECAUSE MOST COURSES MEET MORE THAN ONE OUTCOME, YOUR OUTCOME AUDIT MIGHT BE COMPLETED BEFORE YOU REACH YOUR 40 CREDITS. HOWEVER, YOU MUST STILL COMPLETE 40 CREDITS OF GENERAL EDUCATION

***course fulfills general education and a major requirement**

LIST COURSE AS EACH OUTCOME IS MET:

General Education Outcome Audit	
	Course
KNOWLEDGE	
A1. STEM	*BIO 101
A2. Social & Behavioral Sciences	
A3. Humanities	
A4. Arts & Design	
COMPETENCIES	
B1. Write effectively	
B2. Communicate effectively	
B3. Mathematical, statistical, or computational strategies	*MTH _____
B4. Information literacy	
RESPONSIBILITIES	
C1. Civic knowledge & responsibilities	
C2. Global responsibilities	
C3. Diversity & Inclusion	
INTEGRATE & APPLY	
D1. Ability to synthesize	
GRAND CHALLENGE	
G. At least one course of your 40 credits is an approved "G" course	

The requirement for transfer to CELS out of University College for Academic Success:
Minimum 24 credits and cumulative 2.0 GPA.

Advising Notes: _____

_____

_____

_____

_____

_____

_____

_____

Effective : 2018-2019

B.S. Biotechnology Sample 4 Year Plan - Effective Fall 2019
College of the Environment & Life Sciences

Freshman Year *Fall* Semester

Course Code	Description	Cr
URI 101	Planning for Academic Success	1
BIO 101/103	Principles of Biology I/Lab	4
CHM 101/102	General Chemistry I/Lab	4
MTH103 or MTH 111 or MTH 131 or MTH 141	Pre-calculus or Calculus	3
CMB 110	Introduction to Biotechnology	4
		16

Freshman Year *Spring* Semester

Course Code	Description	Cr
BIO 102/104	Principles of Biology II/Lab	4
CHM 112/114	General Chemistry II and Lab	4
MLS 102	Intro to Clinical Lab Sci	1
MLS 195	Biotechnology Manufacturing Methods	5
CMB 190	Issues in Biotechnology	3
		17

Freshman or Later *Summer**

Course Code	Description	Cr
MLS 199	Internship	12
		12

Year 1 Milestones: Complete **BIO** 101, 103, 102, 104, **CHM 112**, CMB 1XX, 211, **MLS** 195 cumulative GPA of 2.0 or higher.

Sophomore Year *Fall* Semester

Course Code	Description	Cr
CMB 211	Microbiology	4
PHY 111/85	General Physics /Lab	4
CHM 124/126	Intro Organic/Biochemistry/Lab	4
	General Education Course	3
		15

Sophomore Year *Spring* Semester

Course Code	Description	Cr
BIO/CMB 352	Genetics	4
MTH 131 or STA 307 or STA 409	Calculus, Biostatistics, or Research Statistics	3
CMB 311	Biochemistry	3
	General Education Course	3
		13

Year 2 Milestones: Complete **BIO** 352 **MTH 131**, **CHM 124/126** Meet with a MLS Faculty advisor to plan year 3 and 4 courses. Earn at least70 total credits with a cumulative GPA of 2.0 or higher.

Junior Year *Fall* Semester

Course Code	Description	Cr
BIO 341	Cell Biology	3
CMB 333	Immunology	3
	General Education or Elective	6-9
		12-15

Junior Year *Spring* Semester

Course Code	Description	Cr
CMB 437	Fundamentals of Molecular Biology	3
CMB 405	Drug Discovery and Development	3
	General Education or Elective	3
	General Education or Elective	3
		12

Year 3 Milestones: Complete **CMB 333,** 341, 437,CMB/MLS 4XX. Meet with a MLS Faculty advisor to plan year 4 courses. Earn 90-100 total credits with a cumulative GPA of 2.0 or higher. Prepare intent to graduate with faculty advisor for Fall submission.

Senior Year *Fall* Semester

Course Code	Description	Cr
	General Education or Elective	3
	General Education or Elective	3
	General Education or Elective	3
	General Education or Elective	3
		12

Senior Year *Spring* Semester

Course Code	Description	Cr
	Free Electives	12
		12

Year 4 Milestones: Complete remaining Biotechnology required concentration courses Earn total 120 credits with a cumulative GPA of 2.0 or higher. Minimum 2.5 cumulative gpa in MLS/CMB concentration courses.

- **The 12 credit MLS 199 internship can be take either after Freshman, Sophomore or Junior Years.** An internship cannot be guaranteed. In lieu of internship, 12 credits of courses selected from CMB 320, CMB 334, CMB 421, CMB 432, CMB 435, CMB 450, CMB 464, CMB 482

THE UNIVERSITY OF RHODE ISLAND

Student Learning Outcomes Assessment Plan For Accredited and Non-Accredited Graduate Programs, all New Programs and Certificates

Date SLOAA review: **11.28.18**
Date LOOC* review submitted to program: **12.10.18**

***(LOOC Chair and review subcommittee)**

Identified programs must have clearly articulated program goals (Section I) and student learning outcomes statements linked to curriculum and course experiences/requirements (Section II). This Assessment Plan will help programs determine the extent to which these outcomes are aligned with courses and other program requirements providing students with opportunities to develop and master the learning outcomes by graduation. As part of the Plan, each program will also create an assessment timeline (Section III) indicating when and how learning outcomes assessment will take place.[1]

Program Information:

Program:	**Biotechnology**
Academic year plan submitted:	**2019/2020**
Degree(s):	**BS**
Department Chair:	**Gongqin Sun**
Program Director:	**Edward Bozzi**
Accredited Program:	**Not accredited**
Published learning outcomes (provide URL):	**Student learning outcomes will be posted to the new program website upon program approval**

Section I. Program Goals:

Students graduating URI with a BS Degree in Biotechnology should be able to solve problems they encounter in a Biotechnology company/organization. They should be able to utilize their laboratory skills and knowledge to understand problems and present solutions.

#1	**POSSESS KNOWLEDGE AND SKILLS:** Integrate scientific knowledge and laboratory skills.
#2	**BE PROBLEM SOLVERS:** Demonstrate the ability to evaluate the scope of a complex problem and propose a solution.
#3	**BE EFFECTIVE COMMUNICATORS:** Develop appropriate effective communication skills in order to provide results to varied audiences.
#4	**WORK ON TEAMS:** Apply the necessary personal and professional skills to be successful within a team-based environment.

[1] If you have questions or need assistance, please contact: Office of Student Learning, Outcome Assessment, and Accreditation at assess@uri.edu.

THE UNIVERSITY OF RHODE ISLAND

Student Learning Outcomes Assessment Plan For Accredited and Non-Accredited Graduate Programs, all New Programs and Certificates

Section II. Curriculum Mapping: Across the top of the matrix, list courses and other requirements for the program. Order the requirements from left to right in rough chronological sequence, and add a standard description of your program requirements. Down the side, list programmatic student learning outcomes associated with goals. Using the **Map Key** below, indicate the degree to which an outcome will be taught and assessed in relevant courses and by other program requirements.

Program: BIOTECHNOLOGY, BS

Map Key
I = Outcome Introduced
R = Outcome Reinforced
E = Outcome Emphasized

Student Learning Outcomes (Competencies) by Goal:
Statements of observable, measurable results of the educational experience, linked to program goals (Section I), that specify what a student is expected to know or be able to do throughout a program; these must be detailed and meaningful enough to guide decisions in program planning, improvement, pedagogy, and practice.

Course Numbers/Program Requirements:
In addition to specific courses, this can include internships, portfolios, and other requirements not associated with a course number, such as thesis/dissertation proposals, thesis/dissertation defenses, and comprehensive examinations.

		URI101/MLS102	BIO 101/102 Intro Bio	CMB 110/MLS 195 Biot lectures/labs	CHM 101/126 Gen/orgo/Biochem	PHY 111/185 PHY	MTH 111/131	**MLS 199 Internship**	**CMB 211** Microbiology	CMB 333 Immunology	BIO 352 Genetics	CMB 311 Biochem	BIO 341/CMB 437 Cell & Molec Bio	CMB 405 Drug Discovery		
Goal#1 **Integrated Know**	1.1 Demonstrate an understanding of the fundamentals of chemistry/biology and key principles of biochemistry/molecular biology/genetic engineering		I	I	I	I	I	R	R	E	E	E	E	E		
	1.2 Demonstrate advanced biotechnology laboratory skills			I	I	I		E	R							
	1.3 Integrate scientific knowledge and lab skills within the lab setting			I	I			R	R							
Goal #2 **Prob solving**	2.1 Use critical thinking skills to analyze experimental and other data and determine the scope of a laboratory or production problem.		I	I	I	I		R	I	R	R	R	R	R/E		
	2.2 Create and propose solutions to laboratory and production problems.			I	I	I		R	R							

Updated: 9.2018

Goal #3 **Comm Skill**	3.1 Engage in effective communication skills for a variety of audiences.		I	I	I	I		R	I					R/E		
Goal #4 **Teamwork**	4.1 Demonstrate the ability to work effectively in teams	I	I	I	I	I		R	I					R/E		

THE UNIVERSITY OF RHODE ISLAND

Student Learning Outcomes Assessment Plan For Accredited and Non-Accredited Graduate Programs, all New Programs and Certificates

Section III. Assessment Timeline: Indicates when and how student learning will be assessed based on learning outcome statements and expectations. Refer to the curriculum map to propose an assessment timeline in which you will plan to assess the program-level student learning outcomes.

Note: Specify a 6-year plan for assessment to represent **3 two-year reporting periods**:

- Assessment Reporting Period 1: the first academic year in which the program would plan to assess at least one outcome.
- Assessment Reporting Period 2: follows two years later, with plans defined for assessing another outcome(s).
- Assessment Reporting Period 3: follows two years later, with plans defined for assessing additional outcome(s).

All goal areas should be assessed by at least one outcome during the 6-year plan.

Academic Years	Outcome(s)	Course(s) and Other Program Requirements	Assessment Evidence (direct/indirect)	Assessment Method
	WHICH outcome(s) will you examine in each period (use number(s) from curriculum map, e.g. 1.1)	WHERE will you look for evidence of student learning (i.e., what course(s)/program requirements)? Designate for each outcome.	WHAT student work or other evidence will you examine in order to generate conclusions and recommendations? Designate for each requirement.	HOW will you look at the evidence; what means will you use to quantify the evidence? Designate for each source of evidence.
Assessment Reporting Period 1* Report Due May 2021	1.1 Know Science 1.2 Lab Skills 1.3 Integrate knowledge with skills	CMB 211	• Lab reports • Course grades (as indirect evidence)	• Scoring rubric for lab reports with developed performance criteria (Rubrics to be developed by program faculty.)
Assessment Reporting Period 2 Report Due May 2023	2.1 Analyze problems 2.2 Propose solutions 3.1 Communicate effectively	MLS 199 (Internship)	• Internship Supervisor feedback • Research poster presentations	• Internship Supervisor evaluation rubric • Scoring rubric for presentations (Rubrics to be developed by program faculty.)
Assessment Reporting Period 3 Report Due May 2025	1.1 Know Science 2.1 Analyze problems 2.3 Propose solutions 3.1 Communicate effectively 4.1 Teamwork	CMB 405 (new course being proposed with new program)	• Team-based projects	• Scoring rubric for projects • Peer evaluation rubrics (Rubrics to be developed by program faculty.)

* Initial reporting year is established by the program and should depend on the anticipated timeframe for actual program implementation and cohort size.

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NEW PROGRAM ASSESSMENT PLAN REVIEW

Date SLOAA review: **11.28.18**
Date LOOC* review submitted to program: **12.10.18**

***(LOOC Chair and review subcommittee)**

Academic Program/Degree: Biotechnology BS
College: College of Environment and Life Sciences
Date New Program Assessment Plan Submitted for review: 11/28/18
Faculty Member(s) Submitting Plan Proposal: Edward Bozzi, Joel Chandlee

FEEDBACK

Strengths:

SLOAA comments:

- The Assessment Plan presents four overarching program goals with 7 embedded student learning outcomes describing what graduates will know and be able to do upon completion of the program.
- Students are expected to demonstrate essential knowledge and skills during the required internship. This occurs early in the program and is a critical part of the student experience designed for students to reinforce their initial learning with industry experts who provide feedback to the program (and students) on strengths/weaknesses of student performance. This experience also provides the program with feedback on essential industry-appropriate soft skills (e.g., professionalism, including interpersonal skill, timeliness, etc.).
- Three of the curricular requirements present the program's best opportunities for program-level assessment of learning outcomes because they link to all goal areas and occur at different points in the curriculum: CMB211, the internship (BTC 199) and BTC4XX (an integrative learning experience following several required science courses which expand the student's knowledge base.)
- The program intends to teach teamwork skills by providing opportunity for practice through group work and team-based laboratory experiences in early courses; assessment in introductory courses can ensure students are prepared to use these skills in the internship.
- Employer feedback and job placement rates should also provide valuable indirect evidence about the quality of graduates.

LOOC:

- The LOOC committee agrees that the program goals are clear, and the outcomes are measurable and directly related to the goals.
- Outcomes at all stages (introduced, reinforced, emphasized) are mapped to the required courses and the timeline provides an assessment plan, which is both feasible and comprehensive.
- Proposed assessment evidence and methods are sufficiently varied and relevant to the related outcomes (though the details for the team based projects in BTC4XX are still under development).

Suggestions for improvement:

SLOAA: N/A
LOOC: The LOOC committee made three very minor changes to the Assessment plan, for consistency of wording in outcomes and to fix a typo (see LOOC Memo for details).

Issue(s) of note:

SLOAA:

- The program relies on a significant amount of science learning to enable students to have the broad knowledge base required to develop critical thinking skills, integrate information and solve lab and production problems. The 300-level courses support this goal, but are typically very large, serve several majors and do not present practical opportunities for program-level assessment.
- Program was responsive to all suggestions during meetings and via correspondence about the Assessment Plan.

LOOC:

- Rubrics need to be developed prior to implementation of the assessment plan.
- LOOC agrees that employer feedback and job placement rates may provide useful data for assessing the quality of the program (as mentioned by SLOAA above). If the program agrees, it might be useful to begin to plan for how and when these data will be collected.

Assessment Plan Designation:

1 X	2 ____	3 ____
The Assessment Plan is ready for implementation	The Assessment Plan can be implemented after minor revisions, as indicated, and does not require further review	The Assessment Plan requires revisions, and should be submitted for further review after revisions, by date: _____

Program Information		**Reviewer Ratings & Comments**				
Information box complete		☒ Yes ☐ Incomplete *Suggestions:*				
Criteria		***Efficacy of Plan Description & Content***				***Suggestions for improvement***
		Less Developed	**Developing**	**Well Developed**	**Not addressed**	
PART I	**1. Program goals**					
	a. Broad statements of program learning goals	☐	☐	☒	☐	
	b. Limited in number (ideally 2-5)	☐	☐	☒	☐	
PART II	**2. Learning outcomes/competencies**					
	a. Linked to goals (numbered 1.1 etc.)	☐	☐	☒	☐	
	b. Each goal is represented by at least one outcome	☐	☐	☒	☐	
	c. Statements are observable/measurable	☐	☐	☒	☐	
	d. Directed at what students will know or be able to do	☐	☐	☒	☐	
	e. Reasonable number (ideally 1-3 per goal)	☐	☐	☒	☐	7 learning outcomes
	3. Curriculum Map					

	a. Program requirements are listed, developmentally when possible	☐	☐	☒	☐	
	b. Outcomes are linked to appropriate requirements	☐	☐	☒	☐	

	Criteria	Reviewer Ratings & Comments				
		Efficacy of Plan Description & Content				*Suggestions for improvement*
		Less Developed	**Developing**	**Well Developed**	**Not addressed**	
PART III	**4. Assessment Timeline (3-year plan)**					
	a. Assessment Reporting Period 1 is thoroughly presented	☐	☐	☒	☐	
	b. Assessment Reporting Periods 2 and 3 are presented	☐	☐	☒	☐	
	c. All goals are represented by at least one outcome somewhere in the 3 reporting periods	☐	☐	☒	☐	
	d. Requirements are clearly stated and connected to outcomes (from Curriculum Map)	☐	☐	☒	☐	
	e. Evidence is stated for each designated outcome	☐	☐	☒	☐	
	f. Selection of evidence takes advantage of existing indicators	☐	☐	☒	☐	
	g. Evidence is stated in enough detail to guide assessment activities	☐	☒	☐	☐	The specific nature of the sample of student work for BTC4XX is still being developed, but will be guided by the newly developed syllabus which includes the learning outcomes.
	h. Evidence is feasible for collection within the timeline	☐	☐	☒	☐	Program has timed the collection of evidence for each time period to allow for a strong sample over multiple semesters.
	i. Methods for quantifying evidence are stated for each designated outcome	☐	☒	☐	☐	Rubrics need to be developed.
	j. Methods are appropriate for evidence	☐	☒	☐	☐	

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LEARNING OUTCOMES
OVERSIGHT COMMITTEE

Edwards Hall, 64 Upper College Road, Kingston, RI 02881 p: 401.874.4274

THINK BIG WE DO™

MEMORANDUM

December 10, 2018

To: Dr. Edward Bozzi and Dr. Joel Chandlee

From: Kris Bovy, LOOC Chair KMB

Re: New Biotechnology (BS) Assessment Plan Review and Approval

This memo and the attached SLOAA-LOOC Plan Review Feedback Form constitute approval of your Program Assessment Plan for the new Bachelor of Science in Biotechnology.

Please note that the LOOC committee made three very minor changes on the Assessment Plan, as follows:

- Outcome 1.1: Changed to: "**Demonstrate an** understanding of…" instead of "Understanding of…" (changed for consistency with other outcomes)
- Outcome 2.1: Changed to: "**Use** critical thinking…" instead of "Using critical thinking…" (changed for consistency with other outcomes)
- Assessment Reporting Period 3: Changed to outcome **3.1** instead of 33.1 (typo)

Rather than send the plan back for resubmittal, I made these changes directly on the attached plan. For that reason (and because this version also has the approval date on the first page), this new version of the Plan should replace any previous versions of this document. Please include this letter and the two attachments in your program proposal, and **ensure that any language relating to learning outcomes, goals, etc. in your final proposal aligns with the final approved draft** of the Assessment Plan.

Good luck and speed with your full proposal!

Cc: E. Finan

Attachments

LOOC is committed to promoting, supporting, and ensuring effective assessment as an integral part of the student learning experience at the University of Rhode Island.
The University of Rhode Island is an equal opportunity employer committed to the principles of affirmative action.

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THINK BIG WE DO™

BUDGET AND FINANCIAL PLANNING
Adams House, 85 Upper College Road, Kingston, RI 02881 USA p: 401.874.2509 web.uri.edu/budget

DATE: February 5, 2019

TO: Margaret Benz
Coordinator, Faculty Senate

FROM: Linda Barrett
Director, Budget and Financial Planning

SUBJECT: Proposal for a new BS in Biotechnology

As requested in an email from Meredith Silvia, Associate Director in the College of Environmental Life Sciences, dated January 25, 2019, the Budget and Financial Planning Office has reviewed the submitted documents related to the proposal for a new BS in Biotechnology.

The Budget and Financial Planning Office, including communication with Enrollment Services, concurs that the request for a new BS in Biotechnology is expected to have a positive net revenue impact on the Fund 100 unrestricted budget as it has been presented.

Please let us know if you require any further information.

cc: Donald DeHayes
Laura Beauvais
Anthony Rolle
Cheryl Hinkson
Joanne Lawrence
Kelly Slocum
Dean Libutti
Matthew Bodah
Edward Bozzi
Colleen Robillard
John Humphrey

Office/BudgetImpactStatements/bsinbiotechnology/BudgetImpactStatementLetter.final

The University of Rhode Island is an equal opportunity employer committed to community, equity, and diversity and to the principles of affirmative action.

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance. **Page 1 of 3**

Choose one: □ Full-time □ Part-time □ Combination of full- and part-time

REVENUE ESTIMATES

	Year 1		Year 2		Year 3		Year 4	
	2020		2021		2022		2023	
Tuition: In-State	$14,824		$14,824		$14,824		$14,824	
Tuition: Out-State	$27,452		$27,452		$27,452		$27,452	
Tuition: Regional								
Mandatory fees per student								
FTE # of New Students: In-State	40		42		44		46	
FTE # of New Students: Out-State	40		42		44		46	
# of In-State FTE students transferring in from the institution's existing programs								
# of Out-State FTE students transferring in from the institution's existing programs								
TUITION AND FEES	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs
First Year Students								
In-State tuition	$592,960.00	$0.00	$622,608.00	$0.00	$652,256.00	$0.00	$681,904.00	$0.00
Out-of-State tuition	$1,098,080.00	$0.00	$1,152,984.00	$0.00	$1,207,888.00	$0.00	$1,262,792.00	$0.00
Regional tuition								
Mandatory fees	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Second Year Students								
In-State tuition			$592,960.00	$0.00	$622,608.00	$0.00	$652,256.00	$0.00
Out-of-State tuition			$1,098,080.00	$0.00	$1,152,984.00	$0.00	$1,207,888.00	$0.00
Regional tuition								
Mandatory fees			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Third Year Students								
In-State tuition					$592,960.00	$0.00	$622,608.00	$0.00
Out-of-State tuition					$1,098,080.00	$0.00	$1,152,984.00	$0.00
Regional tuition								
Mandatory fees					$0.00	$0.00	$0.00	$0.00
Fourth Year Students								
In-State tuition							$592,960.00	$0.00
Out-of-State tuition							$1,098,080.00	$0.00
Regional tuition								
Mandatory fees							$0.00	$0.00
Total Tuition and Fees	**$1,691,040.00**	**$0.00**	**$3,466,632.00**	**$0.00**	**$5,326,776.00**	**$0.00**	**$7,271,472.00**	**$0.00**
GRANTS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
CONTRACTS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER (Specify)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Grants, Contracts, Other	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
TOTAL	**$1,691,040.00**	**$0.00**	**$3,466,632.00**	**$0.00**	**$5,326,776.00**	**$0.00**	**$7,271,472.00**	**$0.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.

Note: Expected enrollment is 80 with a 50/50 split between in-state and out-of-state students.

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance. **Page 2 of 3**

EXPENDITURE ESTIMATES

	Year 1 2020		Year 2 2021		Year 3 2022		Year 4 2023	
PERSONNEL SERVICES	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources	Additional resources required for program	Expenditures from current resources
Administrators								
Faculty	$249,056.00		$256,528.00		$264,224.00		$272,151.00	
Support Staff	$6,384.00		$6,576.00		$6,773.00		$6,976.00	
Others								
Fringe Benefits (45.4%)	$115,970.00		$119,449.00		$123,033.00		$126,724.00	
Total Personnel	**$371,410.00**	**$0.00**	**$382,553.00**	**$0.00**	**$394,030.00**	**$0.00**	**$405,851.00**	**$0.00**
OPERATING EXPENSES								
Instructional Resources	$19,568.00		$20,155.00		$20,760.00		$21,383.00	
Other (specify)	$17,080.00		$17,592.00		$18,120.00		$18,664.00	
Total Operating Expenses	**$36,648.00**	**$0.00**	**$37,747.00**	**$0.00**	**$38,880.00**	**$0.00**	**$40,047.00**	**$0.00**
CAPITAL								
Facilities								
Equipment								
Other								
Total Capital	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
NET STUDENT ASSISTANCE								
Assistantships								
Fellowships								
Stipends/Scholarships								
Total Student Assistance	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
TOTAL EXPENDITURES	**$408,058.00**	**$0.00**	**$420,300.00**	**$0.00**	**$432,910.00**	**$0.00**	**$445,898.00**	**$0.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.

Note: Fringe is the average of all faculty and support staff.

Note: Other operating expenses include: lab supplies above anticipated course fees, office supplies, telephones, copier lease/maintenance and travel for faculty to professional meetings for professional development.

ACADEMIC PROGRAM BUDGET FORM

Use this form for programs that can be pursued on a full-time basis, part-time basis, or through a combination of full-time and part-time attendance. **Page 3 of 3**

	Year 1 20__	Year 2 20__	Year 3 20__	Year 4 20__
BUDGET SUMMARY OF COMBINED EXISTING AND NEW PROGRAM				
Total Revenue	$1,691,040.00	$3,466,632.00	$5,326,776.00	$7,271,472.00
Total Expenses	$408,058.00	$420,300.00	$432,910.00	$445,898.00
Excess/Defeciency	**$1,282,982.00**	**$3,046,332.00**	**$4,893,866.00**	**$6,825,574.00**
BUDGET SUMMARY OF EXISTING PROGRAM ONLY				
Total Revenue	$0.00	$0.00	$0.00	$0.00
Total Expenses	$0.00	$0.00	$0.00	$0.00
Excess/Defeciency	**$0.00**	**$0.00**	**$0.00**	**$0.00**
BUDGET SUMMARY OF NEW PROGRAM ONLY				
Total of Newly Generated Revenue	$1,691,040.00	$3,466,632.00	$5,326,776.00	$7,271,472.00
Total of Additional Resources Required for	$408,058.00	$420,300.00	$432,910.00	$445,898.00
Excess/Deficiency	**$1,282,982.00**	**$3,046,332.00**	**$4,893,866.00**	**$6,825,574.00**

NOTE: All of the above figures are estimates based on projections made by the institution submitting the proposal.

Undergraduate Biotechnology Major is CMB
Revenue Projection FY2020-FY2023

	Fiscal Year 2020				Fiscal Year 2021				Fiscal Year 2022				Fiscal Year 2023			
	Fall (1st)	**Spring**	**Summer**	**Year 1 Total**	**Fall (2nd)**	**Spring**	**Summer**	**Year 2 Total**	**Fall (3rd)**	**Spring**	**Summer**	**Year 3 Total**	**Fall (4th)**	**Spring**	**Summer**	**Year 4 Total**
# Credit for instruction	17	17			10	3	4		9	10	10		9	9	4	
# Credit for internship			12													
Total Number of Credits	17	17	12		10	3	4		9	10	10		9	9	4	
Enrollment Status	Full-time	Full-time	Pay per credit		Full-time	Full-time	Pay per credit		Full-time	Full-time	Pay per credit		Full-time	Full-time	Pay per credit	
Instate Tuition (per semester)	7,412	7,412			7,412	7,412			7,412	7,412			7,412	7,412		
Regional Tuition (per semester)																
Out-of-state Tuition (per semester)	13,726	13,726			13,726	13,726			13,726	13,726			13,726	13,726		
Summer Per Credit Cost			200				100				100				100	
# Instate Students	40	40	60		42	42	63		44	44	66		46	46	69	
# Regional Students																
# Out-of-state Students	40	40	20		42	42	21		44	44	22		46	46	23	
# Instate Students	296,480	296,480		592,960	311,304	311,304		622,608	326,128	326,128		652,256	340,952	340,952		681,904
# Regional Students	-	-		-	-	-		-	-	-		-	-	-		-
# Out-of-state Students	549,040	549,040		1,098,080	576,492	576,492		1,152,984	603,944	603,944		1,207,888	631,396	631,396		1,262,792
Total Annual Revenues	**845,520**	**845,520**	**192,000**	**1,691,040**	**887,796**	**887,796**	**-**	**1,775,592**	**930,072**	**930,072**	**-**	**1,860,144**	**972,348**	**972,348**	**-**	**1,944,696**

Undergraduate Biotechnology Major is CMB
Expense Projection FY2020-FY2023

	Fiscal Year 2020				Fiscal Year 2021				Fiscal Year 2022				Fiscal Year 2023			
	Fall (1st)	Spring	Summer	Year 1 Total	Fall (2nd)	Spring	Summer	Year 2 Total	Fall (3rd)	Spring	Summer	Year 3 Total	Fall (4th)	Spring	Summer	Year 4 Total
Personnel Expenses																
Edward Bozzi salary (75%)				96,066.79				98,948.79				101,917.25				104,974.77
Edward Bozzi fringe				35,266.12				36,324.10				37,413.82				38,536.24
Christopher Pargellis salary (100%)				74,191.99				76,417.75				78,710.28				81,071.59
Christopher Pargellis fringe				36,658.26				37,758.01				38,890.75				40,057.47
Doreen Osgood salary (100%)				78,796.88				81,160.78				83,595.60				86,103.47
Doreen Osgood fringe				37,664.91				38,794.85				39,958.70				41,157.46
Fiscal Clerk salary (15%)				6,383.65				6,575.16				6,772.41				6,975.58
Fiscal Clerk fringe				6,230.44				6,417.35				6,609.87				6,808.17
Subtotal Personnel Expenses				**371,259.01**				**382,396.79**				**393,868.69**				**405,684.75**
Instructional Resources Expenses																
New equipment purchases	2,000			2,000.00	2,060			2,060.00	2,122			2,121.80	2,185			2,185.45
Service contracts for lab equipment	1,000			1,000.00	1,030			1,030.00	1,061			1,060.90	1,093			1,092.73
Reagents/consumables	8,000			8,000.00	8,240			8,240.00	8,487			8,487.20	8,742			8,741.82
Undergraduate Teaching Assistants	8,568			8,568.00	8,825			8,825.04	9,090			9,089.79	9,362			9,362.48
				-				-				-				-
Subtotal Instructional Resources Expenses	**19,568**	**-**	**-**	**19,568.00**	**20,155**	**-**	**-**	**20,155.04**	**20,760**	**-**	**-**	**20,759.69**	**21,382**	**-**	**-**	**21,382.48**
Other Operating Expenses																
Annual professionals meeting	3,000			3,000.00	3,090			3,090.00	3,183			3,182.70	3,278			3,278.18
Lab supplies	8,000			8,000.00	8,240			8,240.00	8,487			8,487.20	8,742			8,741.82
Office Supplies	2,000			2,000.00	2,060			2,060.00	2,122			2,121.80	2,185			2,185.45
Telephone	1,080			1,080.00	1,112			1,112.40	1,146			1,145.77	1,180			1,180.15
Copier lease/maintenance	3,000			3,000.00	3,090			3,090.00	3,183			3,182.70	3,278			3,278.18
				-				-				-				-
				-				-				-				-
Subtotal Other Operating Expenses	**17,080**	**-**	**-**	**17,080.00**	**17,592**	**-**	**-**	**17,592.40**	**18,120**	**-**	**-**	**18,120.17**	**18,664**	**-**	**-**	**18,663.78**
Total Annual Expenses				**407,907.01**				**420,144.23**				**432,748.55**				**445,731.01**
			fac salary	249,055.65				256,527.32				264,223.14				272,149.83
			support staff sala	6,383.65				6,575.16				6,772.41				6,975.58
			fringe total	115,819.72				119,294.31				122,873.14				126,559.34

LIBRARY IMPACT STATEMENT (New Program Proposal)
LIBRARIAN'S ASSESSMENT

The Collection Management Officer will complete this form as requested, assessing library materials and collections as detailed below, returning. Subject selectors who receive requests for Library Impact Statements for new programs should forward those requests to the CMO.

Program: BS in Biotechnology_____

Department, College: Cell and Molecular Biology, CELS_____

Faculty Member: Edward Bozzi_____

Date Received: November 26, 2018

Date returned to Faculty: November_27, 2018_____

Librarian Completing Assessment: Joanna M. Burkhardt_____

Collection Management Officer: Joanna M. Burkhardt_____

Assessment of:

- Suitability of existing library resources;
- New library resources required to support the program;
- Information skills education required by the students; and
- Funds needed for library materials and services.

Please include:

1. What library holdings already exist in relevant subject categories? How much money is now allocated in the program subject area?

   The library has been steadily purchasing materials in relevant subject categories since the Biotechnology program began. Our monographic and reference holdings are up to date. The allocation for the purchase of monographs for CMB is approximately $1,000 and the allocation for Chemistry is $2,000. The cost of journal subscriptions is not broken out by department.

2. Does URI have the essential journals as noted in the Faculty Questionnaire?

   There are no essential journals noted in the Faculty Questionnaire.

3. What new resources are required to support the program (including media, electronic, or other non-print materials)?

   No new library resources are required to support the program.

4. What information mastery sessions will be required for the students?

   No Information Mastery sessions are required for the students.

5. What is the approximate cost to acquire the materials necessary? Which of these will be continuing costs?

   There are no new costs to the library associated with this program.

rev 3-2-17