

BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Academic Affairs

NO: AAC 14-52

COMMITTEE DATE: June 10, 2014

BOARD DATE: June 17, 2014

**APPLICATION OF FRAMINGHAM STATE UNIVERSITY TO AWARD THE
PROFESSIONAL SCIENCE MASTER IN BIOTECHNOLOGY WITH A
CONCENTRATION IN QUALITY ASSURANCE**

MOVED: The Board of Higher Education hereby approves the application of **Framingham State University** to award the **Professional Science Master in Biotechnology with a concentration in Quality Assurance**.

Upon graduating the first class for these programs, the University shall submit to the Board a status report addressing its success in reaching program goals as stated in the application and in the areas of enrollment, curriculum, faculty resources, and program effectiveness.

Authority: Massachusetts General Laws Chapter 15A, Section 9(b)

Contact: Winifred M. Hagan, Ed.D., Director for Educator Policy

BOARD OF HIGHER EDUCATION

June 2014

Framingham State University Professional Science Master in Biotechnology

INTENT AND MISSION

The proposed Professional Science Master (PSM) in Biotechnology with a concentration in Quality Assurance is planned to align with the Framingham State University (FSU) mission to serve as an important educational and cultural center in the MetroWest region of Massachusetts, and cultivate thoughtful, responsible local and global citizens, prepare students for a career, and position them to succeed.

The proposed Master's program is intended to prepare students for a career in the biotechnology industry. It is also intended to provide the option for a Certificate in Quality Assurance. The certificate can be earned separately or as part of the master's degree and will integrate a number of disciplines including biology, chemistry, technical communication, regulatory affairs, and business. Aligned with the institutional mission, the program will also promote the development of ethically responsible graduates. PSM degree programs combine training in an academic scientific discipline with an additional component of business training, preparing students for a career in industry, government, or healthcare. The PSM degree is intended to bridge the gap between a baccalaureate and a terminal degree, and to focus on developing applicable scientific and professional skills.

The proposed program has obtained all necessary governance approvals on campus and was approved by the Framingham State University Board of Trustees on March 25, 2014. The required letter of intent was circulated on March 10, 2014. No comments were received.

NEED AND DEMAND

National and State Labor Market Outlook

The United States Department of Labor named biotechnology a high-growth industry with an expected growth in employment nationwide of 31% from 2010-2020 for biochemists and biophysicists, 62% for biomedical engineers, 14% for biological technicians, and 36% for medical scientists. The average growth for all biotechnology occupations is projected to be 14%.

The biotechnology field is expected to grow faster than average for all industries by 2020 in the Massachusetts Industry-Occupation Employment Matrix. The Metro-West region of Massachusetts has a high concentration of biotechnology organizations. The MA Biotechnology Center has more than 600 members located within 20 miles of Framingham. FSU is well positioned to provide the training in biotechnology that aligns with regional and statewide workforce needs. The demand for masters' level biotechnical occupations increased

Significantly between 2010 and 2012 with biochemists and physicists increase of 40.5%, medical scientists 41.7% and biomedical engineers by 87.8%¹.

Student Demand

The CGS tracks trends for PSM programs. In 2013 reporting institutions had 7007 applications for PSM programs, representing a 59% increase since 2010, when data was first tracked. FSU expects the PMS in Biotech program to attract undergraduate students who hold bachelor's degrees in molecular biology, biotechnology, biochemistry, or a related life sciences discipline. The University Professional and Continuing Education Association (UPCEA) and its Center for Research and Consulting conducted an environmental scan and analysis for the PSM program. The report noted that most prospective students will need to remain in their jobs full-time while attending school, and the nature of the industry is that few organizations can afford to lose extended employee time to professional development. It was recommended that delivery options should enhance flexibility and convenience for working students. In response to this, the PSM program has been designed to be a part-time program that can be completed in 2.5 years. All courses in the PSM program will be scheduled at night and on weekends to accommodate working students. The Certificate in Quality Assurance can be earned in three consecutive semesters, taking 1-2 courses/semester.

OVERVIEW OF PROPOSED PROGRAM

The proposed PSM in Biotechnology was developed with participation from faculty in the biology, chemistry, mathematics, computer science, and business departments. The preliminary program design was also discussed with biotechnology industry advisory board representatives, and a market research firm was commissioned to study the local environment for the program. The UPCEA environmental scan suggested that an emphasis on quality assurance was an area of need in the biotechnology field. Based on feedback from the industry advisory board and the UPCEA environmental scan, the mission statement and learning objectives were drafted and revised and the curriculum was finalized.

Duplication

A review of universities in the region indicated there are PSM Biotechnology programs at Northeastern, Brandeis and several University of Massachusetts campuses. There are no other PSM programs in Massachusetts with a focus on Quality Assurance in Biotechnology. The proposed program will be the only PSM program in the state university system.

ACADEMIC AND RELATED MATTERS

Admission

An undergraduate or graduate degree in a related life science discipline, with an overall GPA of 2.5 will be required for admission to the proposed program. Students who have no earned credits or training in statistics or cell biology, genetics, and/or molecular biology, may be

¹ Source: Massachusetts Executive Office of Labor and Workforce Development (2013)
http://lmi2.detma.org/lmi/Occupation_projection_a.asp

admitted provisionally and required to take additional courses before beginning the proposed program. GRE scores from an exam taken in the last five years must be submitted along with two letters of recommendation, a current curriculum vitae and a statement of purpose.

Program Enrollment Projection

	# of Students Year 1 Fall 2015	# of Students Year 2 Fall 2016	# of Students Year 3 Fall 2017	# of Students Year 4* Fall 2018
New Full Time				
Continuing Full Time				
New Part Time	15	15	15	15
Continuing Part Time		15	30	30
Totals	15	30	45	45

Curriculum (Attachment A)

The Council of Graduate Schools (CGS) sets standards for PSM degrees. CGS approval typically requires that coursework in a scientific discipline is more than 50% of the program and business content is less than 20%; a capstone experiential component such as an internship or employer-based project; and an advisory board that includes 6-12 members of the local industry. FSU's proposed program meets all of these requirements.

The proposed PSM is comprised of thirteen courses, including an industry internship. Eleven of the thirteen courses are core courses and include scientific and business training and the remaining two courses are science electives. The electives permit students to adapt their program of study to fit a desired biotechnology subdiscipline. Students may earn a Certificate in Quality Assurance without completing the whole PSM program. In order to do so, students must earn credits in five specific PSM courses including Molecular Biotechnology Lab, Quality Assurance for Biotechnology, Business Operations Management for Biotechnology, Drug Development: Process and Regulations, and Statistics.

Field Resources and Internship

The capstone experience for the proposed PSM will be a 400-hour internship that must involve an employer driven project. Students will be able to conduct their internship at their current employer providing they work on a project that is distinct from their everyday role at their company. Students will work with the PSM Program Director and an employer-mentor to ensure an appropriate project. It is planned that student-intern work will be evaluated by the

employer-mentor and FSU faculty member. Students will be required to present a summary and analysis of their project to the PSM community with the guidance of their mentor and, if needed, the approval of an industry supervisor.

RESOURCES AND BUDGET

Fiscal (Attachment B)

The proposed budget includes a year for start-up and planning (2014-2015AY) and the first four years of the program. It assumes 15 incoming students each year and it is expected that the program will be self-supporting by the second year. In the interim, grants and DGCE funds will be used to supplement the income from student tuition and fees. The program is expected to generate revenue and benefit departmental and institutional budgets. The proposed budget has been planned to keep tuition fixed for the first four years. Significant expenses for laboratory start up and no income from tuition are expected in the first year. The program director will be hired during this year with those salary and fringe costs attributed to the Division of Graduate and Continuing Education (DGCE). An administrative assistant will help in the marketing of the program and complete clerical duties associated with processing applications.

FSU has been awarded a \$3 million grant from the Massachusetts Life Sciences Initiative. Part of the grant will be used to purchase the needed equipment for this program. The laboratory equipment may also be used by FSU undergraduates in chemistry and biology. It is planned that in the first operating year of the program (2015-2016 AY), the first incoming cohort of students will take six classes.

Budgets for subsequent years include an estimated 3% increase in costs with tuition fixed. The budget for the second operating year of the program (2016-2017) has an incoming cohort of 15 students, which will take six classes, and a returning cohort of 15 students, which will take three core courses and choose one of 3 offered electives. This requires 12 course instructors and 24 guest lecturers. They will also complete the internship. Year two tuition was calculated for 15 students. Lab fees are only applicable to first-year students and so were calculated assuming 15 students. Year three was similarly budgeted, with 15 incoming students, 15 returning second year students and 15 returning third year students. The program director will administer the internship; the remaining 10 core and 3 elective courses require 13 course leaders and 28 guest lecturers.

Year four is as year three, budgeting for a 3% increase in cost.

Faculty and Administration (Attachment C)

FSU currently has faculty qualified to teach 11 of the 17 courses in the proposed program. Positions that will need to be filled include a full-time program director and part-time course instructors. The Program Director may teach up to 2 courses in the program per year for an additional stipend. While there are six courses for which instructors must be hired, it is expected that the Program Director may fill two of these positions. In addition, roughly 26 guest lecturers per year will be hired by the third year of the program. These individuals will work with course leaders to supplement course materials with examples from industry. This program will require an administrative assistant that will be shared with other DGCE programs, a laboratory

technician that will be shared with Biology department, and assistance from individuals in career services. The budget includes allocations to accommodate these individuals' additional responsibilities.

Facilities, Library and Information Technologies

The library currently supports undergraduate programs in chemistry and biology and master's programs in chemistry and business administration. It is adequately equipped to support the proposed PSM program. The Whittemore Library provides online access to full-text journal articles through subscriptions to a number of databases. In addition, librarians work closely with faculty to identify new acquisitions. The PSM budget allocates \$5000 each year for new library acquisitions and journal subscriptions. Electronic databases include a wide range of publications through ABI, InfoTrac, EBSCOhost, LexisNexis, and Science Direct.

Framingham State University is in the construction phase of a ~\$60 million expansion and upgrade of the Hemenway Hall science facilities. As part of this construction project, 16 new teaching labs will be constructed. A limited number of laboratories in the existing space will be renovated over time. Hemenway Hall will also be updated by increasing accessibility and upgrading services. The expansion will be completed in Fall 2015. It is expected that the proposed PSM program will first require laboratory space in Summer 2016. The PSM program only requires laboratory space during Summer sessions. It is planned that this will be coordinated with undergraduate programs also using the laboratories. The laboratory program will require acquisition of \$222,260 in new equipment. A portion of the Massachusetts Life Science Initiative grant will be used to fully fund the PSM equipment needs. Much of this equipment can be shared with the existing undergraduate programs in chemistry and biology, and/or used for research.

Affiliations and Partnerships

Curriculum, learning objectives, course organization and some course syllabi, were developed with input from an external advisory board. The advisory board will meet 2-3 times per year to review and update the program. FSU has identified members who have agreed to serve in 2014-2015. Members of the board include senior-level scientists and executives from both small and large biotechnology firms, and one FSU Biology alumnus.

Members of PSM Industry Advisory Board, 2014-2015

Name	Title	Affiliation
Ram S. Bandyopadhyay, Ph.D.	Chief Scientist	Boston BioProducts Inc
Russell Doughty	Director, QA and Validation	Civitas Therapeutics
Simon Fricker, Ph.D.	Distinguished Scientific Fellow	Genzyme Corporation
Stephen Gacheru, Ph.D.	QC External Ops	Shire
Keith Harris	Senior Director, R&D Quality	Genzyme Corporation
Alberto Velez (FSU alumnus)	Supervisor, Cell Culture Dept	SBH Sciences Inc.
Keith Watling, Ph.D.	Site Director, Applied Markets Business Unit	Sigma-Aldrich
Debra M. Winslow, RAC, PMP	Vice President Quality Assurance and Project Management	rEVO Biologics

PROGRAM EFFECTIVENESS

Goal	Measurable Objective	Strategy for Achievement	Timetable
Home Department (Biology) Approval			Completed Jan 2014
FSU Graduate Council Approval			Feb 19, 2014
Academic Affairs subcom. approval		Meeting scheduled	Mar 19, 2014
FSU Board of Trustees approval		Meeting scheduled	Mar 25, 2015
Hire Program Director		Job ads posted to Chronicle of Higher Ed, Sciencejobs.org, other appropriate listings	Summer 2014
Application for PSM recognition	CGS recognition	Submit application Spring 2014	Spring 2014
Secure funding for equipment	\$222,260 in grant money allocated to program	Submit proposal to Massachusetts Life Science Initiative; identify additional sources of funding as needed	Spring 2014
Student recruitment	Recruitment of >15 students/year	Aggressive marketing via FSU website, social media, industry conferences	Begin recruitment Fall 2014; increase enrollment to 18-20 students by Fall 2019
Outfit laboratory for first Laboratory course	Acquisition and installation of needed equipment		Fall 2015-Summer 2016
Hire Instructors		Job ads posted to Chronicle of Higher Ed, Sciencejobs.org, other appropriate listings	Ongoing, beginning Fall 2014
Guest lecturer	Recruitment of a pool	Post job ads, social media,	Ongoing, beginning

recruitment	of ~26 by Fall 2017	network	Spring 2015
Student retention	>90% retention after first year	Active one-on-one advising, strategic scheduling of courses	Fall 2016
Identify internship employers	100% internship placement	Work with Career Services to actively contact prospective employers, networking	Ongoing
Student program completion	>50% of incoming cohort complete program in 2.5 years; >85% complete program within 5 years	Active one-on-one advising, strategic scheduling of courses, student surveys to gauge satisfaction	Fall 2017, first graduating class
Successful placement of graduates	Student employment outcomes measured through alumni surveys	Encourage networking within program, promote Career Services	Fall 2017, first graduating class
Adapt curriculum to fit current needs	Internship employer satisfaction measured w/ post-internship survey, student satisfaction measured w/ post-grad. surveys	Advisory board meetings 2x/year, regular evaluation of curriculum in response to student and employer needs	ongoing

EXTERNAL REVIEW AND INSTITUTIONAL RESPONSE

The proposed program was reviewed by Rana Khan Ph.D., Director, MS in Biotechnology (a PSM program) University of Maryland, University College and David Kaplan Ph.D., Director, Bioengineering and Biotechnology Center, Stern Family Professor of Engineering, Professor and Chair, Department of Biomedical Engineering, Professor, Department of Chemical Engineering, Tufts University.

Both reviewers provided a favorable response to the proposed program. They found the proposal to be very strong. The review team commended the proposal on multiple elements including, scheduling classes at night and on weekends, focusing on Quality Assurance, identifying a high demand area of study, providing the option of a certificate in addition to the PSM, developing a strong advisory board, hiring a full time director, including lecturers from the industry, and aligning with the CGS guidelines for PSM programs.

The review team made 4 suggestions for the program. The first was to consider more content on issues of downstream processing related to biotechnology. A second recommendation was to rethink the GRE requirement because many prospective students may have completed undergraduate school and worked for 5 years or more. The third recommendation was to consider expanding guest lectures to include team teaching with faculty. And the final recommendation was to approach industry partners and advisors to make donations toward laboratory support.

FSU responded with agreement that discussion of downstream processing will be planned for the Biotechnology Lab course. FSU will work with the incoming Program Director and the Industry Advisory board to increase emphasis on additional content in other courses. On the GRE requirement FSU responded that test scores from the GRE, MAT, or GMAT are currently required for admission to graduate study across the institution, and that this policy be reviewed and revised if data suggest that other admissions requirements are more accurate predictors of success in the program. FSU will allow otherwise qualified PSM applicants without recent GRE scores to begin with the Certificate courses and transition to the Master's program after successful completion of the Certificate. Regarding industry lectures, FSU will give priority to individuals who are currently employed in the biotechnology industry, especially if they are contributing lectures to the PSM program. Finally, FSU responded to the recommendation for industry donations by pointing to the grant from the Massachusetts Life Sciences Initiative that will be used to support the start-up costs for the program. FSU indicated that as the program adapts to the changing needs of the biotechnology industry, they will consider partnering with local industry to purchase and/or upgrade equipment.

STAFF ANALYSIS AND RECOMMENDATION

Staff thoroughly reviewed all documentation submitted by the **Framingham State University** and external reviewers. Staff recommendation is for approval of the proposed **Professional Science Master in Biotechnology with a Concentration in Quality Assurance**

ATTACHMENT A: CURRICULUM OUTLINE

Major Required (Core) Courses (Total # of courses required = 11)		
Course Number	Course Title	Credit Hours
BIOL-XXX	Molecular Biotechnology	4
MATH-XXX	Statistics^{*2}	4
BIOL-XXX	Biotechnology Lab*	4
BIOL-XXX	Drug Development: Process and Regulations*	4
INTD-XXX	Scientific and Technical Communication	4
PHIL-XXX	Bioethics	4
BADM-XXX	Business Operations Management*	4
BIOL-XXX	Quality Assurance and Quality Control for Biotechnology*	4
BADM-XXX	Management and Leadership for Biotechnology	4
BADM-XXX	Project Management for Biotechnology	4
BIOL-XXX	Capstone Internship	4
	SubTotal # Core Credits Required	44
Elective Course Choices (Total courses required = 2) (attach list of choices if needed)		
CHEM-XXX	Topics in Biochemistry	4
CSCI-XXX	Bioinformatics and Large-scale data analysis	4
BIOL-XXX	Topics in Genetics, Epigenetics, and Genomics	4
BIOL-XXX	Drug Discovery: Drug Targets, Pharmacokinetics, and Pharmacogenetics	4
BIOL-XXX	Cells and Systems	4
BIOL-XXX	Applied Immunology	4
BIOL-XXX	Extended Internship	4
	SubTotal # Elective Credits Required	8
Curriculum Summary		
Total number of courses required for the degree	13	
Total credit hours required for degree	52	
Prerequisite, Concentration or Other Requirements: Students must have an undergraduate degree in an appropriate life sciences discipline and coursework in statistics and molecular		

² * Courses required for Certificate in Quality Assurance

biology, genetics, biochemistry, or related discipline.

ATTACHMENT B: BUDGET (Assumes 15 first-time students/year)

One Time/ Start Up Costs 2014-2015	Cost Categories	Annual Expenses			
		Year 1 2015-2016	Year 2 2016- 2017	Year 3 2017- 2018	Year 4 2018- 2019
\$ 81,887	Full Time Director (Salary & Fringe)	\$84,344	\$86,874	\$89,480	\$92,165
	Part Time/Adjunct Faculty (Stipends for Course instructors and guest lecturers)	\$43,200	\$88,992	\$99,300	\$102,279
	Staff (lab technician and Career Services, stipends)	\$5,000	\$5,150	\$5,305	\$5,464
\$31,495	Staff (Administrative assistant salary and fringe)	\$32,440	\$33,413	\$35,448	\$ 36,511
	General Administrative Costs (maintenance/replacement of lab equipment)	\$6,000	\$6,180	\$6,365	\$6,556
\$	Instructional Materials, Library Acquisitions	\$5,000	\$5,150	\$5,305	\$5,464
\$222,260	Facilities/Space/Equipment				
	Field & Clinical Resources (laboratory consumables)	\$15,000	\$15,450	\$15,914	\$16,391
\$20,000	Marketing	\$2,000	\$2,060	\$2,122	\$2,185
\$32,415	Other (Indirect cost, 10% of direct cost)	\$16,054	\$20,986	\$22,379	\$23,050
\$388,057	TOTALS	\$209,038	\$ 264,255	\$ 281,618	\$ 290,065

One Time/Start-Up Support	Revenue Sources	Annual Income			
		Year 1	Year 2	Year 3	Year 4
\$244,486	Grants				
	Tuition	\$126,000	\$231,000	\$273,000	\$273,000
	Fees	\$21,000	\$21,000	\$21,000	\$21,000
\$31,495	Other (Cost-sharing; portion of salary and fringe for admin. asst.)	\$32,440	\$33,413	\$35,448	\$ 36,511
\$275,981	TOTALS	\$179,440	\$285,413	\$ 329,448	\$330,511
\$ (112,076)	Net Revenue (negative balance funded through DGCE budget)	\$ (29,598)	\$ 21,158	\$ 47,831	\$40,446

ATTACHMENT C: FACULTY FORM

Summary of Faculty Qualified to Teach in Proposed Program							
Please list full-time faculty first, alphabetically by last name. Add additional rows as necessary.							
Name of faculty member (Name, Degree and Field, Title)	Check if Tenured	Courses Taught Put (C) to indicate core course. Put (OL) next to any course currently taught online.	Number of sections	Division of College of Employment	Full- or Part-time in Program	Full- or part-time in other department or program (Please specify)	Sites where individual will teach program courses
Example:							
Apple, Thomas Ph.D. in Criminal Justice Assistant Professor	<input type="checkbox"/>	<ul style="list-style-type: none"> • Intro to Bus (C,OL) • Management (C) • Research Methods (C) 	(2) (3) (3)	Evening	Full-time	No	<ul style="list-style-type: none"> • Main Campus • Quincy campus
Beckwitt, Richard Ph.D. Biological Sciences Professor	x	<ul style="list-style-type: none"> • Molecular Biotechnology (C) • Genetics, Epigenetics, Genomics 	1 1	Day	Part-time	Yes – Full, day division	Main
Bourdan, Dominique M.A. Bioethics Instructor		<ul style="list-style-type: none"> • Bioethics (C) 	1	Day	Part-time	Yes – Full, day division	Main
Cok, Stephen Ph.D, Biochemistry Assistant Professor		<ul style="list-style-type: none"> • Biochemistry 	1	Day	Part-time	Yes – Full, day division	Main
Druffel, Karen J.D., Law Associate Professor	x	<ul style="list-style-type: none"> • Project Management (C) 	1	Day	Part-time	Yes – Full, day division	Main

Hansen, Norman Ph.D., Law, Policy, Society Associate Professor		• Business Operations Mgmt (C)	1	Evening	Part-time	No	Main
Jutras, Phillip Ph.D. Organizational Studies/Leadership in Education Assistant Professor		• Management and Leadership (C)	1	Evening	Part-time	No	Main
Keil, David M.S., Computer Science Assistant Professor	x	• Bioinformatics	1	Day	Part-time	Yes – Full, day division	Main
Mills-Henry, Ishara Ph.D. Biochemistry Assistant Professor		• Molecular Biotechnology (C) • Molecular Biotechnology Lab (C) • Genetics, Epigenetics, Genomics • Biochemistry	1 1 1 1	Day	Part-time	Yes – Full, day division	Main
Muller, Eugene Ph.D. Microbiology Professor	x	• Advanced Immunology	1	Day	Part-time	Yes – Full, day division	Main
Page, Robert Ph.D. Mathematics Associate Professor	x	• Advanced Statistics (C)	1	Day	Part-time	Yes – Full, day division	Main
Rahman, Sandra J.D., Law Associate Professor	x	• Project Mgmt (C) • Mgmt and Leadership (C)	1 1 1	Day	Part-time	Yes – Full, day division	Main
Simons, Amanda Ph.D, Pathology		• Molecular Biotechnology	1 1	Day	Part-time	Yes – Full, day division	Main

Assistant Professor		(C) • Genetics, Epigenetics, Genomics • Biochemistry	1				
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Positions to be filled

Position	Description	Qualifications	Full or Part-time	Day or Evening division
PSM Program Director	The PSM Program Director is an administrative position. The Program Director will serve as a primary contact for students and educators within the program. Responsibilities will include recruiting and supervising 20-30 part-time faculty and guest lecturers to teach in the program, reviewing syllabi to ensure continuity within and among courses, liaising with representatives of the local biotech industry, regularly reviewing program goals and achievements with an external advisory board, recruiting members for an external advisory board, advising students. May also teach up to two courses in area of expertise for additional stipend.	Ph.D. in a related life sciences field, and experience in both higher education and in the biotechnology industry.	Full	Evening
Guest lecturers, all courses	Supplements academic course content by leading 1-2 lectures/discussions in area of expertise; provides examples of industry applications for course content	Masters or Ph.D. in appropriate discipline; current or recent biotechnology industry experience	Part-time	Evening
Course leader, Cells and systems	Instructor of record for PSM elective course. Designs syllabus, organizes the course, and coordinates with 2 guest lecturers to deliver course content. Position may be filled by Program Director.	Masters or Ph.D. in appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	Part-time	Evening
Course leader, Drug Discovery	Instructor of record for PSM elective course. Designs syllabus, organizes the course, and coordinates with 2 guest lecturers to deliver course content. Position may be filled by Program Director.	Masters or Ph.D. in appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	Part-time	Evening
Course leader,	Instructor of record for PSM core course. Designs	Masters or Ph.D. in	Part-	Evening

Position	Description	Qualifications	Full or Part-time	Day or Evening division
Drug Development	syllabus, organizes the course, and coordinates with 2 guest lecturers to deliver course content. Position may be filled by Program Director.	appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	time	
Course leader, Scientific and Technical Communication	Instructor of record for PSM core course. Designs syllabus, organizes the course, and coordinates with 2 guest lecturers to deliver course content. Position may be filled by Program Director.	Masters or Ph.D. in appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	Part-time	Evening
Course leader, Quality Assurance	Instructor of record for PSM core course. Designs syllabus, organizes the course, and coordinates with 2 guest lecturers to deliver course content. Position may be filled by Program Director.	Masters or Ph.D. in appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	Part-time	Evening
Course leader, Molecular Biotechnology Lab	Instructor of record for PSM core course. Designs syllabus, organizes the course, coordinates with laboratory technician to operate laboratory. Position may be filled by Program Director.	Masters or Ph.D. in appropriate discipline; experience in higher education. Biotechnology industry experience a plus.	Part-time	Evening