

## **The Master of Science in Biotechnology**

### **Bayer School of Natural and Environmental Sciences**

Employment within the life sciences industry has been increasing in response to the growth in bio-medicine, renewable energy, and homeland defense with average wages of between \$40,000 and \$63,000. The bio-medical industry by itself represents significant employment opportunities for trained graduates both within the region, the state, and nationally. Bio-energy and Bio-fuels promise to be exciting growth industries for both Pennsylvania and the nation.

A critical need in the life sciences industry is for individuals with both scientific and fundamental business training who can serve as group, project and program managers for emerging life science companies. These individuals will provide an important link between university scientists, the firm's laboratory or development staff and the company's executive management. This program offers an opportunity for working adult graduates to develop their current careers or provide a mechanism to change direction within the focus of commercial science.

The Master of Science in Biotechnology at the Bayer School is a state approved course of study designed to train students with undergraduate science degrees for careers in industrial research and development, product development, or project management in the life sciences. The program fills a need for trained laboratory managers and supervisors employed within the life sciences industry and will offer a pathway for students with four year degrees in the sciences to advance their business careers.

Traditional MS programs in the sciences serve to train students for careers in academic research. The skills required in small and large biomedical industries

require both proficiency in modern laboratory techniques as well as understanding of the industrial environment and the process of product development. The MS in Biotechnology program is designed to supplement technical training in the natural sciences with exposure to industrial research and development coupled with ethics. This program is intended to strengthen and improve a students scientific and laboratory skills while providing the fundamentals of business, project, and group management.

A student completing the program will be prepared for positions managing R&D and Product Development organizations within both large and small bio-medical firms. Graduates should also find careers in evolving life-sciences companies in the areas of manufacturing and operations.

The Bayer School Master of Science in Biotechnology combines advance training in laboratory sciences with instruction in the essentials of commercial research and product development. Business fundamentals are included in the curriculum to improve management and communication skills as well as offer training in entrepreneurship.

To be accepted into the Biotechnology Professional Master of Science Program a student must have successfully completed a BS or BA in the natural or health sciences and meet all additional entrance requirements of the Bayer School of Natural Sciences.

Students entering the program will be required to take required courses in biology or chemistry depending on their specialization and two additional courses in biotechnology. The remainder of the 30 credits required for graduation will be filled

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with electives from the Bayer School graduate program and the Donahue Graduate School of Business. Courses will be selected to provide each student with a customized program directed at their specialty and specific industry requirements.

For additional information, please contact Heather Costello, graduate academic advisor, at (412) 396-6339 or [costelloh@duq.edu](mailto:costelloh@duq.edu)

The Professional Master of Science in Biotechnology is designed to be completed in two years with a minimum of 6 credit hours during the fall and spring semesters and completing the remaining course work during the summer term between years one and two. The courses are offered in the evening to make them available to the working student.

<b>Sample Program</b>				
<b>Sem</b>	<b>Biology Track</b>	<b>Credits</b>	<b>Chemistry/Biochemistry Track</b>	<b>Credits</b>
1	BIO 508 Elements of Biotechnology	3	BIO 508 Elements of Biotechnology	3
	BIO 645 Adv Cell and Molecular Biology	3	Chem 542 Applied BasicData Analysis	1
	BIO 574 Ethics in Biotechnology	1	BIO 674 Ethics in Biotechnology	1
2	BIO 647 Adv Cell and Molecular Biology II	3	Chem 560 Instrumental Analysis	3
	BIO 509 Biotechnology Leadership – Product Development	3	BIO 509 Biotechnology Leadership – Product Development	3
3	BIO 570 Lab I Biology Laboratory	3	CHEM 540 Applied Quantitative Methods of Computational Chemistry	3
	Electives	3-5	Electives	3-5
4-5	Electives	10-12	Electives	9-13
	Total	30	Total	30