

To: MCS College Council
From: Gregg Franklin, Bill Brown
Date: April 28, 2004
Subject: Proposed Masters in Biotechnology Management Program

In previous meetings, we have approved the new 12-unit cross-department course 38-710, "Principles of Biotechnology". The Tepper School's Masters Program Biotechnology Track was discussed; it has now been implemented by the Tepper School.

The proposed joint Biotechnology Management Program is attached. This program, discussed at previous College Council meetings, involves MCS, the Tepper School of Business, and Heinz School of Public Policy. We note that the Tepper School is in the process of modifying its course offerings and the detailed list of required courses from the other colleges may change. However, we propose that College Council consider endorsement of the program in general, the governing committee, and the MCS offerings. We recognize that modifications to the course requirements outside the MCS will occur and that these will require approval by the program's governing committee.

Proposed Masters of Science in Biotechnology Management

Program Management

Program will be managed by a governing committee consisting of the deans of GSIA, Heinz School, and MCS or their designees. The committee reports to the Provost.

Admission to Program

Admission to the program will be granted by the Admissions Chair designated by the governing committee. Prerequisites for admission to the program include previous education equivalent to the courses listed in Table 1.

Students with exceptional academic and professional records lacking some of the required science background may be admitted to the program. In such cases the required additional preparatory courses will be defined by the Admissions Chair. Such courses will not count toward the total units required for the degree and thus such students may require an additional semester.

MSBM Degree Requirements

The program requires a total of 189 units, obtained after admission to the program, from the following categories:

General Management Core:	48 Units
Biotechnology Management Core:	42 Units
Biotechnology Science Core:	51 Units
Electives	48 Units

The courses that satisfy these requirements are listed in Table 2. Courses may be added or dropped by the governing committee.

3-1-1 Program

CMU undergraduate students may be admitted to the program at the start of their senior year. For these students, courses taken at CMU for fulfillment of their undergraduate major may also be used in satisfying the MSBM degree requirements specified above. In addition, MCS and SHS students may use courses in the General Management Core to satisfy their H&SS/CFA/Business Administration Elective Course Requirements.

Table 1: Program Admission Prerequisites

Calculus	One semester	Physics	One semester
Chemistry	Modern Chemistry (9-105) Organic Chemistry (9-217)	Biology	Modern Biology (3-121) Biochemistry (3-231 or 3-232) Genetics (3-330)
Statistics	Statistics for Laboratory Science 36-247 or (45-733 and 45- 734) or 90-786	Lab	Lab Experience in Sciences Equivalent to 12 CMU units

Table 2: Program Courses by Category

General Management Core	Approved Courses	Units
Economics	45-749 / 95-710 / 90-710	6
Policy	45-740 / 90-714	6
Marketing	45-720 / 95-734	6
Finance	45-700 / 45-710 / 95-711	6
Management Science	45-760 / 45-761 / 90-722	12
Operations and Logistics		6
Combinatorics*		6
Total		48

Biotechnology Management Core	Approved Courses	Units
Risk Analysis		6
Biotechnology Regulation, Policy and Compliance*		6
Biotechnology Industry Structure and Strategy *		6
Biotechnology Project Course**		24
Total		42

Biotechnology Science Core	Approved Courses	Units
Principles of Biotechnology	38-710	12
Manufacturing and Lab Practices* (mini)	38-7xx	6
BioEthics		9
Molecular Biology of Prokaryotes/Eukaryotes	03-441/03-442	12
Biotechnology Laboratory**		12
Total		51

Elective Courses: Sample Course List†	(48 total units required including a minimum of 12 taken from each column.)
Marketing	Biomedical Engineering
Entrepreneurship	BioInformatics / Computational Biology
Information Technology Management	Medical Robotics
Advanced Organizational Management	Engineering Processing
Public Policy and Regulation of Technology	Industrial Research and Development
Biotechnology Science	Biotechnology and Environmental Processes

* Indicates new courses to be developed

** Indicates course which may be replaced with research projects or internships if course is not available.

† Many of these courses require pre-requisites and suitability will depend on the student's prior preparation.