

BIOTECHNOLOGY INDUSTRIAL EXPERIENCE

Biotechnology 275, 3 Units

Spring 200X
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Office Hrs: W (11-12:00)
TTh (9-11:00)

Prerequisites: Classified Standing in the Professional Science Master's Program in Biotechnology; Biol/Chem 241B, Biol/Chem 248, and MBA 272, or permission of instructors.

Course Goal: The primary goal of this course is to acquaint students with business or agency culture and to help them identify roles in that culture where scientific expertise in biotechnology is relevant.

Learning Objectives:

- Introductory comprehension the operations of a biotechnology industry/agency enterprise
- Demonstration of professional behavior including conscientious and meticulous performance and a collaborative work ethic
- Ability to discern where knowledge and skills of the cellular and molecular life science can apply to industrial/agency concerns, but with an increasing appreciation of the constraints and opportunities afforded by ethical business principles and practices
- Dissemination of technical information using written progress reports and abstracts
- Organization and delivery of a formal oral presentation

Course Description: This course is a required component of the Professional Science Master's (PSM) Degree in Biotechnology. Each student will participate in an industry/agency-connected internship or internship program that meets the learning objectives of this course. Each student will be required to complete a minimum of 150 hours working on-site, towards specified project objectives developed by the student, the on-site internship supervisor and the California State University, Fresno BIOTC 275 course instructor. The course instructor and the Professional Science Master's Degree coordinator can assist in identification of potential internship placements and in making the initial contacts. It is ultimately the student's responsibility to establish the final arrangements for the position, including the specific work schedule and confirmation of the student's role(s) on the project. The intern is responsible for communicating necessary contact information, i.e. phone, FAX and email information, so that the course instructor and on-site supervisor can communicate effectively regarding student progress. Directions to the work site should be included to facilitate any course instructor visitations to the site.

Internship Agreement: A written agreement outlining the specific objectives of the experience, including their relevance to the course learning objectives, will be formulated between the intern, course instructor and on-site internship supervisor prior to starting the internship experience. Any intellectual property issues and proprietary agreements should be addressed. Concerns about the terms of the agreement should engage the PSM Coordinator to facilitate mediation.

General Types of Internships: Each student may meet the internship requirement through participation with:

(1) a biotechnology industry/agency-sponsored internship program, which may involve business elements but must include substantial scientific and technical components, either for a minimum of 10 hours per week over a 15-week semester or for 20-40 hours per week for 6-10 weeks in an organized summer internship program;

(2) an on-campus project (based on a relevant industry or agency problem), which includes significant scientific and technical objectives, for a minimum of 150 hours over the summer or during the semester; or

(3) a specific biotechnology industry or agency project that is identified by the student or course instructor and sanctioned by the Professional Science Master's Program coordinator as meeting the 150 hour and objectives-relevant criteria for the industrial experience.

Intern Responsibilities:

The student intern serves as a representative of the university in the community and should take this responsibility seriously. Failure to respect the on-site personnel and property will result in a review to determine whether the student shall continue as a PSM student.

Being observant during the internship is a primary responsibility; each intern should take advantage of the opportunity to determine where and how classroom science knowledge facilitates their understanding of the business/agency and what unique experiences the environment provides. In addition, required responsibilities include the following.

- (1) You must become familiar with the operations and safety concerns of your work environments and with the established protocols for the operations that form your role(s) in the assignment or project. Questions or concerns about the working conditions should be addressed to your onsite supervisors and/or to the course instructor.
- (2) You must keep a log of your working hours that can be verified by your onsite supervisor, to assure that you're fulfilling of the required number of work hours for completion of the course requirements.
- (3) You are also expected to maintain a notebook which chronicles your activities and includes a portfolio of your accomplishments over the course of the experience.
- (4) You must respect the rules of your work environment and conform to the professional expectations of the position and ethical standards of conduct.
- (5) Although the internship experience may evolve into a Project opportunity suitable for the culminating experience, completion of the BIOTC 275 course must have defined closure. Each student submits a formal written presentation that summarizes the notebook and portfolio components mentioned above, and an oral presentation that reflects on the achievements, but also relates the student's perspective as to how this internship experience met the learning objectives of the course.

Student Activity Log: Using any method to summarize the events, e.g. log sheet, a daily planner or calendar, document the number of hours worked and the activities associated with those hours. These entries should be verified by the signature of the on-site supervisor during the required face-to-face meetings.

Student Notebook and Portfolio: A bound, paged notebook should serve as a reservoir of

observations, results or conclusions about daily activities during the internship. Each date should be entered with a title of the activity in a form that can be listed in the table of contents, with appropriate page numbers. A brief concluding statement which suggests awareness of the purpose and important events or results acquired during the day should appear following any other observations or entries; this statement should be followed by the intern's signature. In addition, any interim projects or progress reports should be assembled or otherwise documented into a portfolio of products or findings arising from the internship.

Written Presentation: At the conclusion of your assignment you are required to submit a formal written progress report on your accomplishments to the course instructor, and, if required, to your onsite supervisor. The format may be modified to meet the requirements of your industry/agency, but should include, at minimum: a description of the proposed objectives of the project; a description of the approach(es) taken to achieve those objectives; a summary of the important findings; and a statement regarding the impact of these findings on future operations or directions relative to the problem under investigation.

Oral Presentation: Each student is required to make a formal oral presentation on the experience to the Professional Science Master's program participants. The presentations will be 10-15 minutes in length and summarize the findings and the overall experience, especially reflecting on the experience relative to the course goal and learning objectives. A symposium of the presentations by student completing their projects within the past 6 months will be held for the PSM program students and faculty (early September and early February), and representatives of the industrial/agency partners will be invited to attend. As part of the proceedings of this symposium, each student is required to submit an abstract of their presentation including: the background and significance of the problem investigated, the specific purpose, the approaches taken, the findings, and overall conclusions and future directions. Oral presentations will be scored anonymously by all symposium participants to provide each student with an assessment of the strengths and weaknesses of their presentation skills and will also provide an overall assessment of PSM program objectives.

On-site Supervisor's Responsibilities: In addition to formulating the initial written internship agreement to outline the project, the supervisor is expected to meet with the student regularly—ideally weekly, but not less than 6 total hours over the course of the internship. These meetings should be documented in the student's activity log. These meetings should not only facilitate performance of assigned tasks and the evaluation of that performance, but also should attempt to provide the intern with some context regarding his/her role in the broader operations of the business/agency. The supervisor will submit a final evaluation, either (1) a regular performance evaluation for employees of the business or agency, if acceptable, (2) a letter of reference or (3) a written report. The supervisor is strongly encouraged to attend the symposium that includes the intern's oral presentation to further assist in the development of relevant industrial experiences.

Course Professor's Responsibilities: The course instructor will participate in the formulation of the written internship agreement and meet directly with the student to clarify product requirements for completing the course. If possible, the course instructor will visit the business/agency site during the internship period to assess the effectiveness of the experience in

meeting course goals. The course instructor will review the Student Activity Log, Notebook and Portfolio and assist the student in organizing the required written and oral presentations for the course. The course instructor will work with the PSM coordinator to organize the PSM symposium for this intern and will be responsible for evaluating the written and oral communication skills of the student and assigning the final grade.

Grading: The course is graded and all written work is due by the end of the enrolled semester; if necessary, SP grades will be given until completion of the oral presentation. Final grade will be determined based on the relative merits of:

Required Submitted Documents:

10 points for the completed internship agreement

20 points for the completed student activity log

120 points for the completed notebook and the portfolio

On-site Performance:

500 points for subjective evaluation by the onsite supervisor regarding work habits, fit in business culture, ability to work with a team, and overall skills and adeptness for the project or assignment undertaken

Written Presentation:

175 points for course instructor's evaluation of student's written communication skills from the final progress report and oral presentation abstract

Oral Presentation:

175 points for course instructor's evaluation of the oral presentation skills based on the symposium presentation

A= 875-1000 B= 770-874 C= 680-769 D= 600-679 F= <599

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. Contact Services to Students with Disabilities in Madden Library 1049 (278-2811).

Cheating and Plagiarism: "Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the Schedule of Courses (Legal Notices on Cheating and Plagiarism) or the University Catalog (Policies and Regulations).