

PROTEIN CHEMISTRY & ENZYMOLOGY

BIO 679

Lecture Course

Spring 2010

Dr. Manickam Sugumaran

Tel No. 617-287-6598

Office: W/4/072-76

E-mail: manickam.sugumaran@umb.edu

Wednesday 4.30 – 7.30 P. M.

Location: Biology conf room - M-1-318

Textbook: No textbook needed. Make sure to have a good biochemistry textbook at your hand for background info. All materials will be given to you in the class.

Course description: A lecture course on various aspects of protein chemistry and enzymology. Emphasis on purification, characterization, structure, function, mechanism of action, kinetics, and regulatory aspects of enzymes. Topics also include the practical and theoretical aspects of affinity chromatography and other separation techniques, immobilization of enzymes and other biomolecules, enzyme kinetics, and the analytical and industrial use of soluble and insoluble enzymes.

Prerequisites: Biochem 383 and Bio 372, and/or permission of instructor.

Office Hours: Mondays 11:00 a.m. -13:00 p.m. and/or by appointment

Syllabus and Class Schedule:

- Jan. 27. Introductory class.
- Feb. 1. Add/Drop ends
- Feb. 3. Separation technology; Separation and purification of proteins based on their size, charge, biological affinity and other physicochemical properties.
- Feb. 10. Immobilization of enzymes and use of immobilized enzymes.
- Feb 15. President's day - Holiday
- Feb. 17. Primary structure of proteins, amino acid analysis; protein sequencing; peptide synthesis.
- Feb. 24. Secondary, tertiary and quaternary structure of proteins.
- Mar. 3. (Take home exam due) Enzyme classification; enzyme kinetics – single substrate rxns; inhibition studies; multi-substrate rxns.
- Mar. 10. pH and temperature effects on enzymes; thermo-stability of enzymes and enzymes in non-aqueous solution.
- Mar. 13-21 Spring Break
- Mar. 17. Evacuation day.
- Mar. 24. Regulation of enzyme activity; allosteric models (Take home exam due)
- Mar. 31. Active site labeling; chemical modification of proteins; suicidal inactivation.
- Apr. 1. Pass/Fail and Course withdrawal deadline.

Apr. 7. Post-translational modification of proteins.
Apr.14. Catalytic antibodies; Combinatorial chemistry
Apr. 19. Patriot's day - Holiday
Apr. 21. Ribozymes. coenzymes
Apr. 28. Enzyme mechanisms
May. 5. (Take home exam due) Drug discovery through protein chemistry;
Proteomics.
May.12. Classes end. Student presentations.
May. 13-16. Study Period
May. 17-21. Final Exams (No exam) Final Paper due.
May 25 Grades Due

Policy and exams:

All class materials will be given in the class. You are responsible for bringing them to the class if the class extends for the next week. **Attendance is compulsory. If you miss too many classes, your grade will be affected.** Periodically there will be quizzes (10-15 min) from the materials taught from previous week. Selected homework assignment will be given in the class. Average of quizzes (40%), take home exam (30%) and the term paper (30% including presentation) will determine your final grade in this course. In case of any serious problem, contact me in advance.

Accommodations:

Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, (Campus Center, Floor 02, Room 02010, Phone: 617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.

Student Conduct and Academic Honesty:

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct. The Code is available online at:

http://www.management.umb.edu/undergrad/undergrad_code_of_conduct.php#top

Another site to help you define plagiarism is <http://www.lib.umb.edu/cheating>

Please, also refer to the following sites for further UMB policies:

http://www.umb.edu/students/student_rights/index.html

http://www.umb.edu/student_affairs/code.html

<http://www.umb.edu/academics/undergraduate/office/policies.html>