Syllabus for Biochemistry 473/673

Methods in Biochemical Research - Fall 2011

Lecture	**Monday**	**Morrill Hall 109**	**2:00-3:20 PM**
Laboratory	**Thursday and Friday**	**Ladd Hall 308**	**2:00-4:50 PM**
Office Hours	**Thursday**	**IACC 346**	**11:00 AM-12:00 PM**

Course Prefix: BIOC 473/673: Methods in Biochemical Research, 1 lecture, 2 three-hour laboratories, 3 credits.

Prerequisites: BIOC 460 and 461 or BIOC 701 (Graduate Students)

Instructor Contact Information:

Instructor: **Christopher Colbert, PhD.,** Office: IACC 346, Phone: 231-7946, Email: christopher.colbert@ndsu.edu

TA: **Padmaja Ghospurkar,** Office: IACC 348, Phone: 231-8889 (Laboratory), Email: padmaja.ghospurkar@my.ndsu.edu

Bulletin Description: Advanced separation, characterization, and enzymological techniques for research in the biological sciences are emphasized.

Course Aim: The aim of this course is to familiarize the student with common methods involved in the purification and characterization of a protein sample.

Course Objective: In this course common biochemical techniques to purify and characterize a protein sample will be explained. The methods demonstrated in this course include protein expression, protein purification including fractionation and chromatography, protein electrophoresis, and enzymatic analysis of a predetermined enzyme activity. Additionally, scientific writing will be discussed with an emphasis on the organization of ideas (Broad → Focused) using manuscripts from the ACS journal *Biochemistry* as templates.

Required Student Resources: A bound laboratory notebook is required. Additional material will be posted on Blackboard.

Evaluation Procedures and Grading Criteria: Graduate students and undergraduate students will be evaluated differently for this course. Graduate student grading will be more rigorous and consist of more challenging questions on the exams. Additionally, graduate students will be required to take an on-line training module in the responsible conduct of research and provide a summary manuscript of their research. Overall grades will be curved and determined separately for undergraduate and graduate students.

The final grade will be based on **100** points for each of the three exams (Sep. 30, Nov. 10, and Dec. 16), **100** for the lab mini project, **100** for laboratory quizzes (given at the beginning of each laboratory), **150** for laboratory analysis and write-ups (Lab reports are due within 7 days after they are completed based on the syllabus) and **50** points for laboratory notebook checks (notebooks are to be initialed by either the Instructor or the TA at the end of each laboratory) and attendance (see student expectations, NDSU Policy, Section 333). The instructor must be informed prior to any missed laboratory period (via Email or phone) in order to be enabled to make-up missed assignments.

Course Schedule

*****Schedule is subject to change*****

Week 1	Aug. 22	NO CLASS
	Aug. 25	Introduction to Public Databases
	Aug. 26	Introduction to Equipment
Week 2	Aug. 29	Lecture 1
	Sep. 1	Buffer Laboratory
	Sep. 2	Protein Expression Lab 1
Week 3	Sep. 5	NO CLASS
	Sep. 8	Protein Expression Lab 2
	Sep. 9	Bulk purification of protein
Week 4	Sep. 12	Lecture 2
	Sep. 15	Ion Exchange Chromatography Lab
	Sep. 16	Measure [Protein] and SDS-PAGE
Week 5	Sep. 19	Lecture 3
	Sep. 22	Affinity Chromatography Lab
	Sep. 23	Size Exclusion Chromatography Lab
Week 6	Sep. 26	Lecture 4
	Sep. 29	SDS-PAGE and Protein Staining Lab
	Sep. 30	Exam 1
Week 7	Oct. 3	Lecture 5
	Oct. 6	Western Blot Lab 1
	Oct. 7	Western Blot Lab 2
Week 8	Oct. 10	Lecture 6
	Oct. 13	Native gel and transfer Lab
	Oct. 14	Enzymatic Activity Lab
Week 9	Oct. 17	Lecture 7
	Oct. 20	Reprobe Western Blot
	Oct. 21	Reprobe Western Blot
Week 10	Oct. 24	Lecture 8
	Oct. 27	Immunoprecipitation Lab
	Oct. 28	Isoelectric Focusing Lab
Week 11	Oct. 31	Lecture 9
	Nov. 3	2D-PAGE Lab 1
	Nov. 4	2D-PAGE Lab 2
Week 12	Nov. 7	Lecture 10
	Nov. 10	Exam 2
	Nov. 11	NO CLASS
Week 13	Nov. 14	Lecture 11
	Nov. 17	Mini-lab Project
	Nov. 18	Mini-lab Project
Week 14	Nov. 21	NO CLASS
	Nov. 24	NO CLASS
	Nov. 25	NO CLASS
Week 15	Nov. 28	Lecture 13
	Dec. 1	Mini-lab Project
	Dec. 2	Mini-lab Project
Week 16	Dec. 5	Lecture 14
	Dec. 8	Protein Crystallization Laboratory
	Dec. 9	Crystal Viewing and Check-out
Week 17	Dec. 16	Final Exam 8:00am – 10:00am

Course Academic Honesty Statement: All work in this course must be completed in a manner consistent with NDSU University Senate Policy, Section 335: Code of Academic Responsibility and Conduct. http://www.ndsu.nodak.edu/policy/335.htm

Americans with Disabilities Statement: Students with disabilities or other special needs, which need special accommodations in this course, are invited to share these concerns or requests with the instructor as soon as possible.

Considerations for Veterans Statement: Veterans and student soldiers with special circumstances or who are activated are encouraged to notify the instructor in advance.