

# **Syllabus: CHM 484: Biochemistry Capstone**

Course Title: CHM 484: Biochemistry Capstone

Semester: Fall 2024

Instructor: Dr. Jennifer Lee

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Office Hours: Fridays 2:00-4:30 PM OR by appointment

Class Time & Place: Tuesday or Thursday 3:00-4:15 PM in SANCA 355

## **Course Description:**

This capstone course focuses on the design and analysis of biochemical pathways or protein structures with applications in medicine or biotechnology. Students will design and conduct experiments or simulations to study a biochemical system, culminating in a presentation of their findings at the Innovation Showcase. The course includes the development of a project proposal, experimental design, data analysis, and a final report.

## **Course Objectives:**

Design and analyze a biochemical pathway or protein structure.

Conduct experiments or simulations to study the system.

Compare experimental or computational results with existing models.

Effectively present the project at the Innovation Showcase.

## **Learning Outcomes:**

Gain expertise in biochemistry and structural biology.

Develop practical skills in experimental design and data analysis.

Improve communication skills through written reports and presentations.

Enhance the ability to manage biochemistry projects from conception to completion.

## **Group Project and Required Subtasks:**

The group project for this course will involve the design and analysis of a biochemical pathway or protein structure with potential applications in medicine or biotechnology. The project will be broken down into the following subtasks:

### **1. \*\*Project Proposal (Week 3):\*\***

- Create a proposal outlining the biochemical pathway or protein structure being studied, the proposed analysis, and the anticipated outcomes. Include a timeline and assign roles to team members.

### **2. \*\*Literature Review and Experimental Design (Weeks 4-6):\*\***

- Conduct a thorough literature review to identify existing research and gaps. Design experiments or computational models to study the pathway or protein structure.

### **3. \*\*Experimentation or Simulation (Weeks 7-10):\*\***

- Conduct experiments or simulations to study the pathway or protein. Collect data on enzyme kinetics, binding affinities, or structural dynamics.

### **4. \*\*Data Analysis and Interpretation (Weeks 11-12):\*\***

- Analyze the data collected, interpret the results, and compare them to existing models or theories. Refine the experiments or simulations based on the findings.

### **5. \*\*Final Report and Presentation (Weeks 13-15):\*\***

- Document the entire research process, including design decisions, challenges, and outcomes in a final report.
- Prepare a presentation and poster for the Innovation Showcase that highlights the key aspects of the project.

Groups are expected to collaborate closely, meeting regularly to discuss progress and resolve any issues. Instructor check-ins will be scheduled to provide guidance and feedback.

**Evaluation:**

Class meetings (5): 20 points

Individual meetings (3): 12 points

Project Proposal: 10 points

Literature Review and Experimental Design: 15 points

Experimentation or Simulation: 18 points

Data Analysis and Interpretation: 10 points

Final Report: 10 points

Presentation: 5 points

Poster: 10 points

Total: 100 points

**Course Policies:**

**Attendance and Participation:** Regular attendance and active participation are crucial for success in this course. Students are expected to attend all scheduled class meetings and individual sessions. If a student is unable to attend a class, they should inform the instructor in advance and arrange to complete any missed work.

**Academic Integrity:** All students must adhere to ASU's academic integrity policy. Any form of academic dishonesty, including plagiarism, will be reported and may result in severe penalties, including a failing grade for the course.

**Accommodations:** Students with disabilities or special needs should contact the ASU Disability Resource Center to arrange appropriate accommodations and notify the instructor as soon as possible.

**Important Dates:**

Class Week 1: Introductions & Project Brainstorming (Aug 26)

Individual Meeting #1: Discuss Ideas and Readings (Sep 4)

Class Week 2: Proposal Presentation & Group Feedback (Sep 18)

Individual Meeting #2: Proposal Feedback & Methods Discussion (Oct 2)

Class Week 3: Revised Proposal Presentation & CERTT Tour (Oct 23)

Individual Meeting #3: Data Analysis & Progress Review (Nov 13)

Class Week 4: Professional Development & Project Discussion (Nov 27)

Innovation Showcase: Final Presentations & Poster Display (Dec 6)