Course Name: General Biochemistry
Course Number: eBB450/eBB550
Credits: 4
Instructor name: Victor Hsu, Department of Biochemistry and Biophysics
Instructor email: Victor.Hsu@oregonstate.edu

Course Description
Biochemistry sequence course for students with a limited background in physical chemistry.

Prerequisites or Corequisites
Organic Chemistry, CH332 or CH336 or equivalent.

Communication
For questions about the course content, please post your messages in the Q&A Discussion forum in the Canvas course site under the Start Here module. For personal matters and questions that are specific to you, please email me directly at Victor.Hsu@oregonstate.edu. If you put "BB450 W22" (or "BB550 W22") somewhere in the subject line, that will help me prioritize getting back to you quickly. I prefer that you don’t use the Canvas Inbox because it requires me to log into Canvas to reply to you. I will do my best to reply to course-related questions within 24 hours, except weekends and holidays. I will strive to return your assignments and grades for course activities to you within a week of the due date.

Course Materials
No-Cost Textbook: *Biochemistry Free for All* by Kevin Ahern and Indira Rajagopal (available free in iPad, PDF, or Kindle versions).

Time Expectations
This course combines approximately 120 hours of instruction, online activities, and assignments for 4 credits.

Technical Assistance
If you experience any errors or problems while in your online course, contact 24-7 Canvas Support through the Help link within Canvas. If you experience computer difficulties, need help downloading a browser or plug-in, or need assistance logging into a course, contact the IS Service Desk for assistance. Call (541) 737-8787 or visit the IS Service Desk online.

Course Format
BB450 via Ecampus is asynchronous, but it is not self-paced. While we will not have synchronous meetings, everyone will follow the same weekly schedule, including participating in group work. For each topic, you will start with readings from our textbook, then listen to the video lectures. You will also complete Knowledge Checks to help you...
assess whether you are meeting the learning goals of the course. Other formative assessments include working together in a small group to complete problem sets, and creating a project. There will be two exams: a midterm and a final. The work you complete will help you prepare for the exams.

**Proctorio Automated Exam Proctoring**

This course uses a free, automated online proctoring system called Proctorio, where your midterm and final exam sessions are recorded for instructor review. You will need to install a Google Chrome extension. I will give you an ungraded practice quiz via Proctorio before the midterm exam so that you can test your setup and see how it works. Please note that a functioning webcam and microphone are required for using Proctorio and are therefore required for this course. Your security and privacy are important. You can read more about Proctorio’s privacy and data security policies on their website, and more information about using this tool can be found in the course site.

**Course Learning Goals**

1. Acquire the technical language used to communicate biochemistry information and use that language to describe proteins, molecules, signaling pathways, catalysis, and metabolism.
2. Describe key elements of these biochemistry principles: metabolic pathways (including predicting directionality), molecule names and structures, enzyme/cellular control mechanisms, catalysis, and signaling pathways.
3. Perform analyses and basic calculations relating to solutions, energy, and catalysis as they relate to human health.
4. Communicate key concepts of biochemistry.
5. Apply general concepts of biochemistry to relevant, specific problems.

**Evaluation of Student Performance (BB450)**

- Knowledge Checks (5 @ 25 points each) 125 points
- Introduce yourself, syllabus quiz, learner expectations 10 points
- Group Problem Sets (2 @ 25 points each) 50 points
- Group Project Benchmarks (varies, as posted) 90 points
- Midterm Exam 100 points
- Final Exam 125 points
- **Total** 500 points

**Evaluation of Student Performance (BB550)**

- Knowledge Checks (5 @ 25 points each) 125 points
- Introduce yourself, syllabus quiz, learner expectations 10 points
- Group Problem Sets (2 @ 25 points each) 50 points
- Group Project Benchmarks (varies, as posted) 90 points
- Critical Analysis Writeup 25 points
- Midterm Exam 100 points
- Final Exam 125 points
- **Total** 525 points
Letter Grade

<table>
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<th>Grade</th>
<th>Percent Range</th>
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<tbody>
<tr>
<td>A</td>
<td>93-100</td>
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<td>A-</td>
<td>90-92</td>
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<td>B+</td>
<td>87-89</td>
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<td>B</td>
<td>83-86</td>
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<td>C+</td>
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<td>C</td>
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<td>C-</td>
<td>70-72</td>
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<td>D+</td>
<td>67-69</td>
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<td>D</td>
<td>63-66</td>
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<td>D-</td>
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Course Schedule of Topics

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Assigned Reading*</th>
<th>Assessments</th>
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<tbody>
<tr>
<td>1</td>
<td>• Introduction (Scope of Biochemistry)</td>
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<tr>
<td></td>
<td>• Acids &amp; Bases</td>
<td>Ch. 1, pp. 8-20</td>
<td><strong>Discussion:</strong> Introduce Yourself</td>
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<td>Ch. 1, pp. 25-42</td>
<td><strong>Survey:</strong> Your learning expectations</td>
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<td>Ch. 1, pp. 43-49</td>
<td><strong>Project:</strong> Select topic</td>
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<tr>
<td>2</td>
<td>• Protein Structure</td>
<td>Ch. 2, pp. 55-70</td>
<td><strong>Quiz:</strong> Syllabus Quiz</td>
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<td></td>
<td>• Hemoglobin</td>
<td>Ch. 2, pp. 74-106,110-114</td>
<td><strong>Quiz:</strong> Knowledge Check #1 for Weeks 1-2</td>
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<td></td>
<td></td>
<td>Ch. 2, pp. 130-140</td>
<td><strong>Project:</strong> Turn in Outline and Bibliography</td>
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<tr>
<td>3</td>
<td>• Protein Characterization</td>
<td>Ch. 8, pp. 857-896</td>
<td><strong>Problem Set 1:</strong></td>
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<td></td>
<td>• Metabolic Strategies</td>
<td>Ch. 5, pp. 411-426</td>
<td>• Individual Submission</td>
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<td>• Group Discussion</td>
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<td>• Group Submission</td>
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<td>4</td>
<td>• Enzymes, General</td>
<td>Ch. 4, pp. 336-360</td>
<td><strong>Quiz:</strong> Knowledge Check #2 for Weeks 3-4</td>
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<tr>
<td>Week</td>
<td>Topics</td>
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<td>Assessments</td>
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<td>5</td>
<td>• Enzymes, Catalytic Strategies</td>
<td>Ch. 4, pp. 363-378</td>
<td><strong>Exam</strong>: Midterm</td>
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<td><strong>BB550</strong>: Submit paper for approval</td>
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<td>6</td>
<td>• Enzyme Regulation</td>
<td>Ch. 4, pp. 381-407</td>
<td><strong>Quiz</strong>: Knowledge Check #3 for Week 6</td>
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<td><strong>Project</strong>: Turn in rough draft</td>
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<td>7</td>
<td>• Cellular Signaling</td>
<td>Ch. 7, pp. 828-852</td>
<td><strong>Project</strong>: Peer review the assigned rough draft</td>
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<td>8</td>
<td>• Carbohydrates</td>
<td>Ch. 2, pp. 190-216</td>
<td><strong>Quiz</strong>: Knowledge Check #4 for Weeks 7-8</td>
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<td><strong>Problem Set 2</strong>:</td>
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<td>• Individual Submission</td>
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<td>• Group Discussion</td>
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<td>• Group Submission</td>
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<tr>
<td>9</td>
<td>• Glycolysis and Gluconeogenesis</td>
<td>Ch. 6, pp. 485-509</td>
<td><strong>BB550</strong>: Turn in Critical Analysis Writeup</td>
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<tr>
<td>10</td>
<td>• Glycogen Metabolism</td>
<td>Ch. 6, pp. 510-520</td>
<td><strong>Quiz</strong>: Knowledge Check #5 for Weeks 9-10</td>
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<td><strong>Project</strong>: Turn in presentation</td>
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<td><strong>Finals</strong></td>
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<td><strong>Exam</strong>: Final</td>
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*Listed page numbers refer to the PDF version of the text; for other formats (or late-breaking corrections on my part), refer to heading titles listed in the Canvas module for that week.

**Course Activities**

- **Knowledge Checks**: These are short, timed quizzes that can be attempted a total of three times. They are “open book” and will help you to prepare for the format of our exams, as well as to gauge how well you are comprehending the material. The week they are held, they open Mondays at 8:00 AM and close Saturdays at 11:59 PM Pacific. The knowledge checks will not be reopened for any reason, and a key will not be posted.

- **Group Problem Sets and Project**: You will work on Problem Sets individually and together with a small group via a Discussion Board. Each group will compile their agreed-upon answers and submit the assignment with all the group members’ names. You will also complete a project with your group, with benchmarks due at
intervals during the term. On all group Discussion Boards, keep in mind that if I can’t see your work, you will not receive points. This means the conversation can’t be moved to another format (i.e., Google Docs) and must be conducted on the Board.

- **Exams:** The midterm covers the first half of the course content and the final covers the second half, plus we will revisit the first half to a lesser extent (~20%).

- **Critical Analysis Writeup (BB550):** BB 550 students have an additional required assignment which entails a critical analysis of a recent (within the last two years), full-length, primary research publication, involving any topic covered this term. Your chosen paper must first be submitted for approval of appropriateness. Your writeup should take the form of a written Journal Club presentation, in which you present a clear summary and critical analysis of the paper. The following questions should be considered and addressed: Is the paper a significant contribution to the knowledge base? If so, why? If not, why not? Are experimental methods clearly described? Do the authors adequately consider alternative models? Are the conclusions drawn justified based on the reported results? What are the most important future directions for the work? *Substantiate your opinions by citing other work from the literature.* Recommended length of paper: 2–3 pages.

**Learner Expectations**

- Keep up with the weekly learning materials.
- Submit all assignments on time.
- Participate fully and equally in group work.
- Recognize that mastering the complexities of biochemistry requires considerable time and effort.

**Course Policies**

**Late Work Policies**

**Knowledge Checks:** These quizzes are closed by Saturday at 11:59 PM and will not be reopened.

**Assignments:** Late work on Individual Problem Sets, Group Problem Sets, and Group Project Benchmarks will incur a 10% penalty per day and will not be accepted more than 5 days late.

**Discussion Boards:** Late work on Discussion Boards will not be awarded any points, because the lateness affects the entire group. Please be courteous and let your group know if you are going to be unavailable so that they don’t wait for your contribution before turning in an assignment.

**Makeup Exams**

Makeup exams will be given only for reasons approved by the instructor in advance of the exam or in documented emergency circumstances. Makeup exams will not be given for routine illness (colds, stomach aches, or other common ailments). Arrangements regarding a missed exam will generally not be made after the exam has occurred, except under very unusual circumstances.
Students are expected to do their own work and not look up answers during the exams. The use of cell phones or electronic devices are strictly forbidden during exams.

**Incompletes**

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of your child), **AND** if the student has turned in at least half of the course work on time and has a passing grade at the time of the request. This is in accordance with OSU Academic Regulation 17. If you are having any difficulty that might prevent you completing the coursework, please don’t wait until the end of the term; let me know right away.

**Statement Regarding Religious Accommodation**

Oregon State University is required to provide reasonable accommodations for employee and student sincerely held religious beliefs. It is incumbent on the student making the request to make the faculty member aware of the request as soon as possible prior to the need for the accommodation. See the [Religious Accommodation Process for Students](http://beav.es/codeofconduct).

**Guidelines for a Productive and Effective Online Classroom**

(Adapted from Dr. Susan Shaw, Oregon State University)

Students are expected to conduct themselves in the course (e.g., on discussion boards, email) in compliance with the university’s regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

Active interaction with peers and your instructor is essential to success in this online course, paying particular attention to the following:

- Unless indicated otherwise, please complete the readings and view other instructional materials for each week before participating in the discussion board.
- Read your posts carefully before submitting them.
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

**Expectations for Student Conduct**

Student conduct is governed by the university’s policies, as explained in the [Student Conduct Code](https://beav.es/codeofconduct). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university’s regulations regarding civility.

This course is offered through Oregon State University Extended Campus. For more information visit: [http://ecampus.oregonstate.edu](http://ecampus.oregonstate.edu).
**Academic Integrity**

Integrity is a character-driven commitment to honesty, doing what is right, and guiding others to do what is right. Oregon State University Ecampus students and faculty have a responsibility to act with integrity in all of our educational work, and that integrity enables this community of learners to interact in the spirit of trust, honesty, and fairness across the globe.

Academic misconduct, or violations of academic integrity, can fall into seven broad areas, including but not limited to: cheating; plagiarism; falsification; assisting; tampering; multiple submissions of work; and unauthorized recording and use.

It is important that you understand what student actions are defined as academic misconduct at Oregon State University. The OSU Libraries offer a [tutorial on academic misconduct](http://ecampus.oregonstate.edu), and you can also refer to the [OSU Student Code of Conduct](http://ecampus.oregonstate.edu) and the [Office of Student Conduct and Community Standard’s website](http://ecampus.oregonstate.edu) for more information. More importantly, if you are unsure if something will violate our academic integrity policy, ask your professors, GTAs, academic advisors, or academic integrity officers.

**TurnItIn**

Your instructor may ask you to submit one or more of your writings to Turnitin, a plagiarism prevention service. Your assignment content will be checked for potential plagiarism against Internet sources, academic journal articles, and the papers of other OSU students, for common or borrowed content. Turnitin generates a report that highlights any potentially unoriginal text in your paper. The report may be submitted directly to your instructor or your instructor may elect to have you submit initial drafts through Turnitin, and you will receive the report allowing you the opportunity to make adjustments and ensure that all source material has been properly cited. Papers you submit through Turnitin for this or any class will be added to the OSU Turnitin database and may be checked against other OSU paper submissions. You will retain all rights to your written work. For further information, visit [Academic Integrity for Students: Turnitin – What is it?](http://ecampus.oregonstate.edu)

**Statement Regarding Students with Disabilities**

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval, please contact DAS immediately at 541-737-4098 or at the [Disability Access Services](http://ds.oregonstate.edu) website, [http://ds.oregonstate.edu](http://ds.oregonstate.edu). DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

**Accessibility of Course Materials**

All materials used in this course are intended to be accessible. If you require accommodations, please contact [Disability Access Services (DAS)](http://ds.oregonstate.edu).
Additionally, Canvas, the learning management system through which this course is offered, provides a vendor statement certifying how the platform is accessible to students with disabilities.

**Tutoring and Writing Assistance**

TutorMe is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Access TutorMe from within your Canvas course menu.

The Oregon State Online Writing Suite is also available for students enrolled in Ecampus courses.

**Ecampus Reach Out for Success**

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it’s important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success.

Ecampus students are always encouraged to discuss issues that impact your academic success with the Ecampus Success Team. Email ecampus.success@oregonstate.edu to identify strategies and resources that can support you in your educational goals.

If you feel comfortable sharing how a hardship may impact your performance in this course, please reach out to me as your instructor.

- **For mental health:**
  Learn about counseling and psychological resources for Ecampus students. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

- **For financial hardship:**
  Any student whose academic performance is impacted due to financial stress or the inability to afford groceries, housing, and other necessities for any reason is urged to contact the Director of Care for support (541-737-8748).

**Student Evaluation of Courses**

During Fall, Winter, and Spring term, the online Student Evaluation of Teaching system opens to students the Wednesday of week 8 and closes the Sunday before Finals Week. Students will receive notification, instructions and the link through their ONID email. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the learning experience of future students. Responses are anonymous (unless a student chooses to “sign” their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.