

BC467 Biochemistry of Human Disease Course Syllabus

Credits: 3

Time/Location: Spring, MWF @ 1:00 PM, MRB123

Prerequisites: BC 401

Instructor: Dr. Eric Ross: eric.ross@colostate.edu (MRB343)

Course description: This course will focus on specific diseases of current biochemical and medical interest, including genetic and metabolic disorders, chronic diseases, infectious agents and emerging diseases. Through lectures, presentations, and discussions, students will build upon their foundation in biochemistry and molecular biology to better understand the biochemical mechanisms of specific human diseases. *Please note that the exact topics to be covered and dates are subject to change.*

Course objective: To provide students with up-to-date understanding of the biochemical basis of a wide range of human diseases and conditions. In particular, students will become knowledgeable in the mechanisms of disease etiology, progression and pathogenesis in humans.

Methods of evaluation: The course will consist primarily of lectures, complemented with classroom discussion and student presentations. The grade will be based on 4 exams (55%), online quizzes and assignments (25%); an oral presentation (15%), and participation in classroom discussions and activities (5%). As appropriate, homework grades will be incorporated into the exam grade for each section.

Instructional methodology: The teaching mode for this course will consist of a combination of lectures (in person or remote) and discussion, supplemented with student presentations and reading assignments.

Text: Selected review articles and primary literature.

Academic Integrity: This course will adhere to the CSU Academic Integrity Policy as found in the General Catalog – 1.6, pages 7-9 (<http://www.catalog.colostate.edu/Content/files/2012/FrontPDF/1.6POLICIES.pdf>) and the Student Conduct Code (<http://www.conflictresolution.colostate.edu/conduct-code>). At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.

Course Topics:

January 19-21:

1. *Genetic Diseases:*

- ❑ Course Introduction, Introduction to Cytogenetic Disorders
- ❑ Cytogenetic Disorders: Microdeletion/duplication syndromes

January 24-28:

- ❑ Cytogenetic Disorders:
 - i. Imprinting Diseases—Prader Willi/Angelman, etc.
 - ii. Structural rearrangements
 - iii. Aneuploidy – Sex chromosome changes

January 31 - February 4:

- ❑ Cytogenetic Disorders: Genetic Testing
- ❑ Cytogenetic Disorders: Wrap-up
- ❑ Lysosomal Storage Diseases and treatment—Gaucher, Fabry, etc.

February 7-11:

- ❑ **Exam #1:** *Material through February 4th*
- ❑ Metabolic diseases: Aminoacidopathies and treatment—Phenylketonuria, etc.
- ❑ Structural defects —Duchenne muscular dystrophy, collagen, etc.

February 14-20:

- ❑ Defects in Receptor Proteins—hypercholesterolemia, hyperlipoproteinemia, etc
- ❑ Transport defects: Cystic fibrosis
- ❑ Hemoglobinopathies—sickle cell disease, thalassemias, etc.

February 21-25:

- ❑ Mitochondrial Disorders
- ❑ Student presentation: Genetic diseases
- ❑ Student Presentation: Genetic diseases

Feb 28 – March 4:

- ❑ Pharmacogenetics—Malignant hyperthermia, G6PD deficiency, etc
- ❑ Genetic diseases: Wrap-up
- ❑ Student Presentations: Genetic diseases

March 7-11:

- ❑ **Exam #2:** *Material from February 9th through March 4th*
- ❑ Trinucleotide Repeat Disorders: Molecular basis; Fragile X
- ❑ Student Presentations: Genetic diseases

March 14-18: Spring Break

March 21-25:

2. *Protein misfolding disorders:*

- ❑ Trinucleotide Repeat Disorders: Huntington's Disease
- ❑ Amyloid diseases – overview
- ❑ Student Presentations: Genetic diseases

March 28- April 1:

- ❑ Amyloid diseases – Recent advances
- ❑ Prion diseases – Molecular basis
- ❑ Student Presentations: Protein misfolding diseases

April 4-8:

- ❑ Prion diseases - Kuru, Creutzfeldt-Jakob Disease, Bovine Spongiform Encephalopathy (BSE), Chronic Wasting Disease (CWD).
- ❑ Liquid-liquid phase separation in biology & disease
- ❑ Student presentations: Protein misfolding diseases

April 11-15:

3. *Special Topics*

- ❑ **Exam #3:** *Material from March 21st through April 8th*
- ❑ Virology overview
- ❑ Student presentations: Protein misfolding diseases

April 18-22:

4. *Virology*

- ❑ Virology subclasses
- ❑ Influenza
- ❑ Student presentations: Viruses

April 25-29:

- ❑ COVID
- ❑ Virology: Vaccines & herd immunity
- ❑ Student presentations: Viruses

May 2-6:

- ❑ Causation versus correlation in medical research
- ❑ Vaccines and autism
- ❑ Review

Finals week: **Wednesday, May 11th, 7:30-9:30 AM.**

- ❑ **Exam #4.** *Material from April 11^h to May 6th.*

Important information for students:

Masks are required inside university buildings. You must also meet university vaccine or exemption requirements.

All students are expected and required to report to the COVID Reporter

(<https://covid.colostate.edu/reporter/>) when:

- You suspect you have symptoms of COVID, regardless of whether or not you are vaccinated and even if your symptoms are mild
- You have tested positive for COVID through a non-CSU testing site, such as home test or test at a pharmacy
- You believe you may have been exposed to COVID go to the COVID Reporter and follow the guidance under “I believe I have been in close contact with someone who has COVID-19.” This guidance will depend upon your individual circumstances

You will not be penalized in any way for reporting symptoms or concerns.

Do not ask me as your instructor to report for you. It is your responsibility to report through the COVID Reporter promptly.

As your instructor I may not ask you about vaccination status or if you have COVID but you may freely volunteer to send me information from a public health official - if you have been asked to isolate or quarantine.

When you complete the COVID Reporter, the CSU Public Health office is notified. Once notified, that office will contact you and, depending upon each situation, will conduct contact tracing, initiate any necessary public health requirements and notify you if you need to take any steps.

If you do not have internet access to fill out the online COVID-19 Reporter, please call (970) 491-4600.

For the latest information about the University’s COVID resources and information, including FAQs about the spring semester, please visit the **CSU COVID-19 site** <https://covid.colostate.edu/>.