CHEM 6540
Chemical Biology Core Course
Spring 2022 Course Syllabus

CHEM 6540, Chemical Biology Design and Instrumentation: 3 hours. The goal of this course is to emphasize the determination, structure, and chemical function of biological molecules utilizing current instrumental techniques and methods. The topics of the course include biological chemical function, structure related to function of biological chemistries, instrumentation and methods in chemical biology. *(Notice: CHEM 6xxx requires algebraic and trigonometric calculations, and requires the background to perform such. A Biochemistry I course is required)*

Instructor: Dr. Guido F. Verbeck
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Class Schedule: MWF 8:00-8:50, Chemistry 253
Office Hours: Monday and Friday: 9:00am-11:00am Hickory Hall 004

Basic Principles of Biological Chemistry, Cell Culture and Techniques
January 19- Lipid and Membrane Chemistry
24- Protein Structure and Dynamics
26- Animal Cell Culture
28- Stem Cell Culture
31- Introduction to Light Spectroscopy and Imaging

February 02- Fluorescence Spectroscopy, Imaging
04- Flow Cytometry

Protein Biochemistry
February 07- Protein Preparation Techniques
11- Fluorescence Labeling and Microscopy
16- UV/Vis Spectroscopy and Circular Dichroism
21- Liquid Chromatography – Fraction Collection
25- Electrophoresis

Protein Structure Techniques
March 02- Computation Techniques
07- Introduction to NMR
11- Protein NMR
21- Introduction to Crystallography
25- Protein Crystallography
Immunochemistry and Microfluidics

March  28- Immunoassays, Immuno Microscopy

April  01- Introduction to Microfluidics
        04- Microfluidic Devices and Mechanisms
        06- Lab-on-a-Chip

Other Spectroscopic Techniques

April  11- Infrared and Raman Spectroscopy
        15- Atomic Spectroscopy

Mass Spectrometry

April  20- Introduction to Mass Spectrometry
        22- Gas Chromatography – Mass Spectrometry
        27- Electrospray
        29- Matrix-Assisted Laser-Desorption (MALDI)

May   04- Introduction to Online Tools

May   09- Final Exam, CHEM 253, 8:00am-10am

Required Text Readings:


Suggested Readings:


Tests and Project:

4 Tests will be given at announced times for 100 pts. each.

Grading:

The course grade is the sum of the exams out of 400 total points.

Grading Scale:

- 90.0 – 100.0 %  A
- 80.0 - 89.0 %  B
- 70.0 - 79.0 %  C
- 60.0 - 69.0 %  D
- Below 60.0 %  F
Attendance Policy:  
Class attendance is highly recommended and will be monitored periodically. Students who miss the class are responsible for all the missed class materials that may not be addressed by the instructor in a subsequent class.

**Note:** *I reserve the right to make changes/modifications of the syllabus if needed.*

Additional Information:

1. According to University policy, the grade of I (incomplete) cannot be given as a substitute for a failing grade in a course.

2. Statement of ADA Compliance: The chemistry department cooperates with the Office of Disability Accommodations to make reasonable accommodations for qualified students with disabilities. If applicable, please present your request along with an official written verification from the ODA before the end of the first week of classes.