

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

	<u>Basic Principles of Biological Chemistry, Cell Culture and Techniques</u>	
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
	<u>Protein Biochemistry</u>	
February	07-	Protein Preparation Techniques
	11-	Fluorescence Labeling and Microscopy
	16-	UV/Vis Spectroscopy and Circular Dichroism
	21-	Liquid Chromatography – Fraction Collection
	25-	Electrophoresis
	<u>Protein Structure Techniques</u>	
March	02-	Computation Techniques
	07-	Introduction to NMR
	11-	Protein NMR
	21-	Introduction to Crystallography
	25-	Protein Crystallography

	<u>Immunochemistry and Microfluidics</u>
March	28- Immunoassays, Immuno Microscopy
April	01- Introduction to Microfluidics
	04- Microfluidic Devices and Mechanisms
	06- Lab-on-a-Chip
	<u>Other Spectroscopic Techniques</u>
April	11- Infrared and Raman Spectroscopy
	15- Atomic Spectroscopy
	<u>Mass Spectrometry</u>
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:

1. Hofmann, Andreas; Clokie, Samuel, Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology, Cambridge Publishing, 8th Edition, 2018.

Suggested Readings:

1. Hermanson, Greg, Bioconjugate Techniques, Academic Press.
2. Gurr, Michael; Harwood, John, Frayn, Keith, Lipid Biochemistry, Blackwell Science.

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.