

Schedule for MCBI 7420 “Physiology and Ultrastructure of Microorganisms”

Fall 2024

Section 1 – The Cell Envelope & Signaling Systems

Mon, Aug 19	Pesci	Structure and Function I: Overview of the Cell Envelope
Tues, Aug 20	Pesci	Structure and Function II: Specific Cell Envelope Structures
Wed, Aug 21	Pesci	Export: Efflux Systems
Thurs, Aug 22	Pesci	Paper Discussion
Mon, Aug 26	Motaleb	Mechanisms of Genetic Switching
Tues, Aug 27	Martin	Transport I: Porins, Symport, Antiport, Group Translocation
Wed, Aug 28	Martin	Transport II: TonB-dependent, ABC-type transporters
Thurs, Aug 29	Martin	paper discussion
Mon, Sept 02	No Class	NO CLASS STATE HOLIDAY
Tues, Sept 03	Martin	Export: Secretion Systems
Wed, Sept 04	Martin	Sigma Factors in Gene Regulation
Thurs, Sept 05	Martin	Paper discussion
Mon, Sept 09	Exam 1	
Tues, Sept 10	Motaleb	Motility and Chemotaxis: The Che System
Wed, Sept 11	Motaleb	Two-component Regulatory systems
Thurs, Sept 12	Motaleb	paper discussion
Mon, Sept 16	Motaleb	Cyclic Nucleotide Signaling Systems

Tues, Sept 17	Motaleb	Paper Discussion
---------------	---------	------------------

Section 2 – Catabolism and Energy Generation/Biosynthesis of Cellular Components

Wed, Sept 18	Coleman	Overview of Bacterial Nutrition
Thurs, Sept 19	Coleman	Central Pathways I – Glycolytic pathways
Mon, Sept 23	Coleman	Central Pathways II – TCA and Anapleurotic Pathways
Tues, Sept 24	Coleman	Central Pathways III – Fermentation Pathways
Wed, Sept 25	Coleman	Paper discussion
Thurs, Sept 26	Coleman	Bacterial Energetics – Overview
Mon, Sept 30	Coleman	Bacterial Energetics — Electron Transport Systems
Tues, Oct 01	Coleman	Bacterial Energetics – ATP Synthesis
Wed, Oct 02	Coleman	Paper discussion
Thurs, Oct 03	Study Day/Makeup Day	

Sat, Oct 5 – Tues, Oct 8	Fall Break
--------------------------	------------

Wed, Oct 09	Exam 2	
Thurs, Oct 10	Barton	Prokaryotic Genome Structure
Mon, Oct 14	Roop	Genetic Analysis of Bacteria
Tues, Oct 15	Rocha	Control of Energy Generating Pathways; Choice of Electron Acceptor
Wed, Oct 16	Rocha	Ammonia Assimilation: Glutamine Synthetase, Glutamate Dehydrogenase, Glutamate Synthase
Thurs, Oct 17	Rocha	Paper Discussion
Mon, Oct 21	Rocha	Sulfate Assimilation and Cysteine Biosynthesis
Tues, Oct 22	Pechous	Aspects of molecular interactions in the human microbiome
Wed, Oct 23	Pechous	Paper Discussion
Thurs, Oct 24	Pechous	Redox Control and Oxidative Stress
Mon, Oct 28	Pechous	Paper Discussion
Tues, Oct 29	Study Day	

Wed, Oct 30	Exam 3	
--------------------	---------------	--

Section 3 – Growth and Global Regulatory Systems

Thurs, Oct 31	Pesci	Quorum sensing: Who's Out There
---------------	-------	---------------------------------

Mon, Nov 04	Pesci	Paper Discussion
Tues, Nov 05	Farrow	The CRISPR/CAS system
Wed, Nov 06	Farrow	The CRISPR/CAS system paper discussion
Thurs, Nov 07	Farrow	Bacterial Immunity: Novel Antiphage Defense Systems
Mon Nov 11	Farrow	Paper discussion
Tues, Nov 12	Farrow	Biofilms: Adhesion and Antimicrobial Tolerance
Wed, Nov 13	Farrow	Paper Discussion
Thurs, Nov 14	Roop	Role of Small Regulatory RNAs in Microbial Physiology
Mon, Nov 18	Bitzer	Generalized Cytoplasmic and Extracytoplasmic Stress Responses
Tues, Nov 19	Bitzer	Paper discussion
Wed, Nov 20	Barton	Stringent Response/Stationary Phase
Thurs, Nov 21	Barton	Paper discussion
Mon, Nov 25	Roop	Bacterial Persistence and Dormancy
Tues, Nov 26	Roop	Paper discussion
Wed, Nov 27—Sun, Dec 01 Thanksgiving Break		
Mon, Dec 02	Roop	Iron Homeostasis
Tues, Dec 03	Study Day/Makeup Day	
Thurs, Dec 05	Exam 4	
Mon, Dec 09	Grades Due	

Class:

The class will meet in the Biotechnology Building conference room 110 from 11 AM – 12 Noon.

Exams: All exams will be in Biotechnology Building Room 110 from 10 AM to Noon.

Exam 1 covers lectures from August 19 to September 05

Exam 2 covers lectures from September 10 to October 02

Exam 3 covers lectures from October 10 to October 28

Exam 4 covers lectures from October 31 to December 02

Course grading policy:

The course grade will be calculated from the combined scores of the four exams, with each exam carrying equal weight. These exams will be based on the lectures and any **additional material in your assigned readings**.

No specific text has been adopted for the course. Individual instructors will provide you with your assigned reading materials. Specific papers discussed in class will be handed out at least 5 days before the discussion period.

Course Director – MD MOTALEB (252-744-3129; motalebm@ecu.edu) Biotech 116