

Exploring Medicine

Syllabus

Fall 2023

Course Description:

Exploring Medicine is a course designed for students interested in the health professions, particularly students seeking a career as a medical doctor, doctor of osteopathy, physician assistant, or nurse practitioner. Students will study selected systems of the body and learn the pathophysiology and treatment of a variety of human diseases and conditions. In addition, students will delve deeply into discussions of social aspects that influence health and the business of medicine. The purpose of this course is to help students see the relevance of their basic sciences, be better prepared for the MCAT, be better prepared for medical school, and be a step ahead in their decision to pursue a career in medicine.

Course Objectives: By completing the modules of this course, the student will be able to

1. Apply basic science knowledge and skills to clinical medicine
2. Describe how the body maintains homeostasis
3. Explain the concepts of diagnosis and treatment of disease
4. Reveal an understanding of social issues that determine health, health insurance, physician billing, budgeting, and more regarding the business of medicine

Prerequisites: None, but students of sophomore or higher level tend to master the material best.

Required Materials: Exploring Medicine online text, lecture videos, and quizzes need to be purchased through the Exploring Medicine website (<https://exploringmedicine.net/>). The instructor will send (or already has sent) a link for the purchase of this material. For students that like the option of having something to hold to read, a hard copy of the core module text is available as an additional optional purchase (inquire at info@exploringmedicine.net). This text does not contain material on all modules covered and is not a substitute for the continually updated online content.

Grading Policy: Students are graded in the following manner:

- Modules:
1. Cardiovascular System: 20 points
 2. Respiratory System: 20 points
 3. Renal – Acid/Base: 20 points
 5. Diabetic Ketoacidosis: 20 points

Module quizzes: 80 points (total of the above 4 modules) – **scored on first attempt**

Renal – Acid/Base 20 questions: 20 points

Business of Medicine Project: 100 points

Final Exam: Cumulative exam: 80 points (online module content only, not BoM)

Total points possible: 280 points

A	91 – 100%
AB	84 – 91%
B	79 – 84%
C	70 – 79%
D	60 – 70%
F	0 – 60%

Academic Integrity: It is anticipated that students will do all of their own work and complete their quizzes independently. Students will have unique login accounts. No one should log into another student's account. The Research/Presentation project is a group project. All members of the group are expected to make significant contributions to this project and will receive individual scores for their presentation on selected topic.

Exploring Medicine Module Descriptions:

Module 1: Introduction to Course:

1. Welcome
2. Introduction to Course Lectures
 - a. Applying basic science to clinical medicine
 - b. Exploring Medicine Mission statement
 - c. The influence of social factors on healthcare
 - d. Begin discussion of the Cardiovascular System
3. MCAT Foundational Concept 1, Category 1D
4. MCAT Foundational Concept 2, Category 2A
5. Foundational Concept 9, Category 9B: Demographic characteristics and processes
6. MCAT Foundational Concept 10, Category 10A: Social inequality

Module 2: Cardiovascular System: Shock

1. Focused Anatomy and Physiology of CV system
 - a. Electrical and mechanical events of the heart
 - b. Dynamic nature of large vessels
 - c. Fluid movement across capillaries
 - d. Blood and its contents
2. Pathophysiology of Shock
 - a. Hypovolemic
 - b. Cardiogenic
 - c. Vasogenic
 - d. Mechanical/Obstructive
3. Shock Scenarios
4. MCAT Foundational Concept 1, Category 1D
5. MCAT Foundational Concept 2, Category 2A
6. MCAT Foundational Concept 3, Category 3B
7. MCAT Foundational Concept 4, Category 4B
8. MCAT Scientific and Reasoning Skill 1

Module 3: Respiratory System: Asthma

1. Focused Anatomy and Physiology
 - a. Mechanics of breathing
 - b. Arterial blood gasses
 - c. Cellular physiology

2. Pathophysiology of Asthma
 - a. Obstructive vs. Restrictive lung disease
 - b. Spirometry
3. Treatment of Asthma
4. Asthma and other respiratory pathophysiologic scenarios
5. MCAT Foundational Concept 1, Category 1D
6. MCAT Foundational Concept 2, Category 2A
7. MCAT Foundational Concept 3, Category 3B
8. MCAT Foundational Concept 4, Category 4B
9. MCAT Scientific and Reasoning Skill 1

Module 4: Module 4: Renal System - Acid/Base: Acid/Base disorders

1. Focused Anatomy and Physiology
 - a. Kidney function
 - b. The nephron
 - c. Glomerular Filtration
 - d. Fluids and Electrolytes
2. Pathophysiology of Acid/Base disorders
3. Acid/Base “20 questions” and scenarios
4. MCAT Foundational Concept 2, Category 2A
5. MCAT Foundational Concept 3, Category 3B
6. MCAT Foundational Concept 4, Category 4B
7. MCAT Foundational Concept 5, Category 5A
8. MCAT Scientific and Reasoning Skill 1

Module 5: Diabetic Ketoacidosis (DKA)

1. Focused discussion about diabetes
2. Pathophysiology of DKA
3. Applications of basic science to DKA
 - a. Facilitated transport across cell membranes
 - b. Acid/Base physiology and buffers
 - c. Henderson-Hasselbalch equation
4. MCAT Foundational Concept
 - a. Foundational Concept 1, Category 1D: Principles of bioenergetics and fuel molecule metabolism
 - b. Foundational Concept 2, Category 2A: Assemblies of molecules, cells, and groups of cells within single cellular and multicellular organisms

- c. Foundational Concept 3, Category 3B: Structure and integrative functions of the main organ systems
- d. Foundational Concept 4, Category 4B: Importance of fluids for the circulation of blood, gas movement, and gas exchange

Module 6: Business of Medicine project:

1. Overview of Module
 - a. History of reimbursement for medical services
 - b. History of Health Insurance
 - c. What is a Professional Fee and a Facility Fee
 - d. What are RVU's
 - e. Fee for Service vs. Capitated Reimbursement
 - f. Politics as it relates to health care policy
 - g. The National Debt, US GDP, and health care spending
 - h. Examine the various provider practice settings
2. Project - Budgeting expenses as a new physician/PA

Course Schedule Fall 2023:

Aug. 29th, Week 1:

1. Experiential learning: Central Venous line placement
2. Introduction – Review syllabus
3. Intro module
4. Begin CV Unit
5. Complete CV online module (text, supplemental video, video lecture) for next class

Sept. 5th, Week 2:

1. Finish CV Unit presentation
2. Complete small group CV Scenarios
3. Complete Resp online module for class on Jan . 25th
4. **CV Module quiz due Sept. 6th at 11:30 PM**

Sept. 12th, Week 3:

1. Review any residual CV questions
2. Review Resp Module lesson
3. Complete Resp small group scenarios
4. Complete Renal-Acid/Base online module
5. **Renal Acid/Base quiz due Feb. 8th, at 11:30PM**

Sept. 19th, Week 4:

1. Begin Renal-Acid/Base Review
2. Distribute Acid/Base 20 questions handout – due next class
3. Discuss Business of Medicine project
4. **Resp Module quiz due Sept. 27th at 11:30PM**

Sept. 26th, Week 5:

1. Renal-Acid/Base Review
2. Renal-Acid Base Scenarios
3. Renal-Acid Base 20 questions – review and correct in class
4. **Renal Acid/Base Module quiz due Oct. 4th, at 11:30PM**
5. Discuss Business of Medicine Module
6. Select groups for Business of Medicine presentation
7. Complete DKA module for next class

Oct. 3rd, Week 6:

1. Introduce profile cases: DKA
2. Begin Diabetes Mellitus/DKA module lesson

Oct. 9th:

No class: Fall Break

Oct. 17th, Week 7:

1. Complete Diabetes Mellitus/DKA module lesson
2. Finish DKA cases – Pathophys and Treatment
3. Complete small group scenarios
4. Review and hand out Project Rubrics/scenarios
5. **DKA module quiz due Feb. 18th at 11:30PM**

Oct. 24th, Week 8:

Provider Panel

Oct. 31st, Week 9:

1. Review for Final Exam
2. Clinical Scenario potpourri

Nov. 7th, Week 10:
Final Exam

Nov. 14th, Week 11:

1. Business of Medicine – History of Health Insurance and more (How medical providers get paid)
2. Discuss Business of Medicine Project and Presentations

Nov. 21st:
No Class, Thanksgiving Break

Nov. 28th, Week 12:
Budget Presentations

Dec. 5th, Week 13:

1. Budget Presentations
2. Course evaluations
3. Mission Work