

BMED 6793: Systems Pathophysiology – Spring 2026

Lecture Room & Format: Emory HSRB2 N100, In-person only

All lectures for this class will be held entirely at Emory, and in-person attendance is required, as there will be no Zoom or hybrid option.

Lecture times: Tue/ Thur 3:55 to 5:10 PM (To accommodate shuttle schedule)

GT/Emory Shuttle: Students are strongly recommended to use the shuttle to attend the class.

[Stinger Bus Routes | Parking & Transportation Services | Georgia Institute of Technology | Atlanta, GA \(gatech.edu\)](#) (Links to an external site.) (Links to an external site.)

- The shuttle leaves GT Nanotech Bldg at 3:04 PM and arrives at HSRB by 3:40 PM.
- After class, the shuttle leaves HSRB for GT at 5:15 PM.

Course Co-Director: Hanjoong Jo, Ph.D., Emory HSRB E170. hjo@emory.edu

Co-Director: Sung Jin Park, PhD. Emory HSRB E116. sung.jin.park@emory.edu

Learning Objectives

In this course, students learn basic concepts of human pathophysiology in cardiovascular, genetic, infectious, metabolic, renal, cancer, bone, and neural diseases. Students should be able to recognize different types of human diseases and have a basic understanding of how each disease develops in target tissues and cells, including their gross and cellular morphology, pathogenic mechanisms, diagnosis, and treatment. Students will learn current trends in human disease research, with emphasis on bioengineering approaches. Students should be able to understand the challenges in preventing, diagnosing, and treating diseases and explore how they can apply their biomedical engineering minds and skills to this important area.

Suggested Text

Kumar, Cotran, and Robbins, Robbins Basic Pathology, 8th edition, Saunders
Additional reading as assigned

Pre-requisite: College-level Biology or Systems Physiology

Grading

Attendance and Participation	5% (1% reduction for each absence)
Hot paper presentation	10%
Final Team Presentation	15%
Mid-term Exam	35%
Final Exam	35%

1. Hot paper presentation: 10%

1 oral presentation per student (10 min presentation + 3 min Q&A) on a hot paper*

- Hot paper: Select a recently published paper published within the past two years in high-impact journals (with an **impact factor ≥ 10**) such as Science, Nature, Cell, or their sister journals (e.g., Science Translational Med, Nature Medicine, Nature BME, Nature Comm, Nature Materials, Nature Biotech, PNAS, etc.).
- Any papers broadly related to pathophysiology with or without BME relations may be used.
- Do not select review papers unless specifically recommended by Drs. Jo or Park.

- Do not select clinical trial papers without sufficient mechanistic studies unless recommended by Drs. Jo or Park.
- Students must submit these papers (PDF file or URL along with IF scores) at least 1 week before the presentation for approval by Drs. Jo or Park.

2. Final Team Presentation: 15%

An in-depth report involving 2 or 3 related hot papers (at least two should qualify as hot papers) by a team of two students will be presented at the end of the semester.

Topics could be chosen from subjects broadly related to the lecture topics, but the team is encouraged to incorporate biomedical engineering approaches.

Papers presented as Hot papers in the class may not be used again in the Team Presentation.

All papers to be presented must be approved at least 1 week before the presentation by Drs. Jo or Park.

Presentation time: 20 min (10 min per student) group + 5 min Q&A.

4. Mid-term exam: 35%

5. Exam 2: 35%

Grading: Absolute grading. A: 90 - 100% of the overall grades; B: 80 – 89%; C: 70-79; D:60-69;

F: below 60

2025 Spring Pathophysiology- Class Schedule: Tue/Thur 3:55-5:10PM in HSRB2 N100 @ Emory

Date	TOPIC	Instructor
Jan 13	Introduction	Hanjoong Jo
Jan 15	Bone disease & Pathophysiology	George Beck (Endocrinology)
Jan 20	Stroke	Fadi Nahab (Neurology)
Jan 22	CVD1 – Heart Failure	Amir Rezvan (Cardiology)
Jan 27	CVD2 – Heart valve disease	Bradley Leshnower (Surgery)
Jan 29	Hot paper 1 – CVD, Bone	Hanjoong Jo
Feb 3	CVD3 – Atherosclerosis & Hypertension	Robert Taylor (Cardiology)
Feb 5	ID1 - HIV Pathophysiology and Treatment	Eric Hunter (Immunology)
Feb 10	Cancer1– Pathobiology and Treatment	Ned Waller (Oncology)
Feb 12	ID2 – Lung Disease & Treatment	TBD
Feb 17	Hot papers 2 –Immune disease, Infectious disease (ID)	Hanjoong Jo
Feb 19	Exam 1	
Feb 24	Cancer3 – Head and Neck cancer	Nabil Saba (Oncology)
Feb 26	Cancer2 – Brain Cancer	Kimberly Hoang (Neurosurgery)
Mar 3	Human tissue specimen review	Douglas Parker (Pathology)
Mar 5	Peripheral Nerve Injury	Timothy C Cope (Bioscience & BME)
Mar 10	Brain Injury	David Wright (Emergency Med)
Mar 12	Alzheimer's disease	Erik Johnson (Neurology)
Mar 17	Hot papers 3 – Cancer	Hanjoong Jo
Mar 19	Hot papers 4 – Brain & Neural diseases	Sung Jin Park
Mar 24	Spring Break – no class	
Mar 26	Spring Break – no class	
Mar 31	Renal disease	Romero, Cesar Andres (Pediatrics)
Apr 2	Diabetes	Sara Markley-Webster (Endocrinology)
Apr 7	Genetic disease	Judy Fridovich-Kiel (Genetics)

Apr 9	Hot papers 5 – Genetic disease, Renal, and Diabetes	Sung Jin Park
Apr 14	Final team presentations #1	Sung Jin Park
Apr 16	Final team presentations #2	Sung Jin Park
Apr 21	Final team presentations #3	Sung Jin Park
Apr 23	Final team presentations #4	Sung Jin Park
Apr 28	Exam 2	Sung Jin Park

January 12 (Mon)	Spring Classes	First day of classes for Spring 2026
January 19 (Mon)	Spring Holiday	Official institute holiday -- Martin Luther King, Jr. Day
March 23 (Mon) - 27 (Fri)	Spring Holiday	Spring Break
April 27 (Mon) - 28 (Tue)	Spring Classes	Final instructional class days for Spring 2026
April 29 (Wed)	Spring Reading Period	Reading period
April 30 (Thu) - May 7 (Thu)	Spring Exams	Final exams. Policy in the Catalog under Rules/Regulations XII . Contact the Registrar's Office with questions.