

GS02-1073: Fundamental anatomy, physiology, and biology for medical physicists

Syllabus, Spring Semester 2021

Lectures: MWF 8:00 – 9:00 am

FCT14.5059 (now virtual)

Course coordinator:

A. Kyle Jones, Ph.D.

Phone No.

3-0552

Office

FCT14.5026

Other lecturers as listed on schedule

Office hours

Contact kyle.jones@mdanderson.org to make an appointment.

GSBS important dates

January 11, 2021: Classes start

January 18, 2021: MLK Day holiday

February 15, 2021: Presidents' Day holiday

March 15-19, 2021: Spring Break Holiday

April 30, 2021: Last day of classes

Grades

Final grades will be based on the following weighting:

Exams (50%), assignments, quizzes, presentations, and participation (50%)

Exams (50%)

Each exam will be weighted equally.

Assignments, quizzes, presentations, and participation (50%)

A variety of activities other than formal exams will be used to engage students and assess class progress. Of course, you must be present to participate.

Grading scale

A: 86.7 – 100

B: 73.3 – 86.6

C: 60 – 73.2

F: < 60

Textbooks

Suggested: Lippincott's Illustrated Reviews – Biochemistry (6th ed.), Denise R. Ferrier.
Lippincott, Williams, & Wilkins (2013) ISBN 9781451175622

The Biology of Cancer (2nd ed.), Robert A. Weinberg. Garland Science (2013)
ISBN 9780815342205

Molecular Biology of the Cell (6th ed.), Bruce Alberts et al. Garland Science
(2014) ISBN 9780815344322

Lehninger Principles of Biochemistry (6th ed.), David L. Nelson. W.H. Freeman (2012) ISBN 9781429234146

Basic Clinical Radiobiology (4th ed.), Michael Joiner and Albert van der Kogel. CRC Press (2009) ISBN 9780340929667

Human Anatomy & Physiology, Elaine N. Marieb (10th ed.) ISBN 9780321927040

Our knowledge of the subjects covered by these textbooks, for the most part, does not evolve at such a rate that past editions become obsolete within a year. Thus, an edition within 1 or 2 of the current one should suffice.

Online resources:

www.openstax.org

<https://www.imaios.com/en/e-Anatomy>

(must be connected to MD Anderson network to access e-Anatomy for free)

Learning objectives:

1. Describe the normal anatomy and physiology of the human body.
2. Identify anatomic organs and structures in radiologic images and review how radiologic imaging is used to diagnose disease.
3. Compare how cancer develops and grows to normal growth and maintenance of the body.
4. Discuss cancer of different organ systems and how these cancers are diagnosed and treated.
5. Explain how radiotherapy is used in the treatment of cancer.

Date	Lecture Title	Lecturer(s)	Exception?
1/11/21	Introduction and terminology	Jones	
1/13/21	Tissues and the integument	Jones	
1/15/21	Radiation effects on the skin and hair	Jones	
1/18/21	NO CLASS - HOLIDAY		
1/20/21	Student presentations	Jones	
1/22/21	Student presentations	Jones	
1/25/21	Pathogenesis of normal tissue side effects and time factors in normal tissue response to radiation	Howell	
1/27/21	NO CLASS		
1/29/21	Modified fractionation	Howell	
2/1/21	Musculoskeletal system 1	Jones	
2/2/21	The oxygen effect and tumor hypoxia	Howell	T 8-9 am
2/3/21	Musculoskeletal system 2	Jones	
2/5/21	Musculoskeletal imaging	Amini	
2/8/21	Musculoskeletal oncology	Moon	
2/10/21	The endocrine system	Jones	
2/12/21	Thyroid and other endocrine tumors	Varghese	
2/15/21	NO CLASS – HOLIDAY		
2/17/21	EXAM 1	Jones	
2/19/21	Microanatomy of the nervous system	Jones	
2/22/21	CNS anatomy	Jones	
2/24/21	PNS and the human visual system	Jones	
2/26/21	Imaging of the nervous system	Schellingerout	
3/1/21	Microanatomy of the cardiovascular system	Jones	
3/3/21	Cardiovascular anatomy and physiology I	Jones	
3/5/21	The heart	Jones	
3/8/21	Cardiovascular anatomy and physiology II	Jones	
3/10/21	Breast cancer and its treatment	Woodward	
3/12/21	Pulmonary anatomy and respiratory gas transport	Jones	
3/15/21	NO CLASS - HOLIDAY		
3/17/21	NO CLASS - HOLIDAY		
3/19/21	NO CLASS – HOLIDAY		
3/22/21	Cardiopulmonary imaging	Gladish	
3/24/21	Lung cancer: medical and radiation oncology	Glisson	
3/26/21	Biological response modifiers for normal tissues	Howell	
3/29/21	Retreatment tolerance of normal tissues	Howell	
3/31/21	EXAM 2	Jones	

4/2/21	Lymphatic system	Jones	
4/5/21	Molecular imaging and targeted therapy	Erwin	
4/7/21	GI system 1	Jones	
4/9/21	GI system 2	Jones	
4/12/21	GI oncology	Overman	
4/14/21	GI imaging case studies	Patnana	
4/16/21	Genitourinary system 1	Jones	
4/19/21	Genitourinary system 2	Jones	
4/21/21	Heritable effects of radiation and radiation effects in utero	Klopp	
4/23/21	GU imaging case studies	Bhosale	
4/26/21	GU oncology	Choi	
4/28/21	Student presentations	Jones	
4/30/21	Student presentations	Jones	
	FINAL EXAM		