Department of Medical Imaging Sciences

Faculty of Health Sciences

American University of Beirut

Course number: MIMG202

Course name: MIS Physics

Summer semester AY 2018 - 2019

Course Instructor:

Name: Marlen S. Keushgerian

Office: AUBMC SB 16

Email: ms30@aub.edu.lb

Office hours: by appointment

Class time and location:

Tuesdays and Thursdays: 7:30 – 8:55

Classroom: AUBMC- Phase I- Floor: SB- Room # SB21

Course description:

This course focuses on relating units of measurement, the structure of the atom, electrostatics, electrodynamics, electromagnetism, AC generators, DC motors and transformers to imaging equipment.

Emphasis is placed on rectification, production of x – rays, interaction of x – rays with matter, radioactivity and health physics.

Course learning objectives*:*

By the end of the course, students will be able to:

At the end of this course the student will be able to:

1. To describe the process of x – ray production
2. To know the process of interaction of ionizing radiation with matter
3. To discuss various types of radioactive decay and their relevance to nuclear medicine imaging

4. To understand the concepts of; exposure, absorbed dose and dose equivalent; concepts of ALARA (As Low As reasonably Achievable); basic requirements for the safe use of ionizing radiation; effects of radiation and methods of dose minimization

Required readings

Notes: All lectures and reading materials and exercises will be uploaded on Moodle / emailed.

Course requirements and student evaluations:

	Assessment	Percent	Linked to objectives
A.	Attendance and Class Contribution	10%	
B.	Test 1	10%	1
C.	Test 2	10%	2
D.	Test 3	10%	3
E.	Test 4	15%	4

N.B.: The passing grade for the course is 60/100

AUB/FHS policies

- ✓ *Attendance*

Attendance is mandatory and attendance will be taken in each lecture and lab session. You are expected to attend all classes and participate in classroom activities. If you miss a class, it is your responsibility to make up for the material missed and inquire about any announcements made. As per AUB General Regulations, students who miss more than one-fifth of the sessions of any course in the first ten weeks of the semester (five weeks in the case of the summer term) are dropped from the course.

- ✓ *Academic Integrity*

Education is demanding and time management is essential. Do not hesitate to use the resources around you but do not cut corners. Cheating and plagiarism will not be tolerated. Please review the Student Code of Conduct in your handbook available on the following web page: https://www.aub.edu.lb/sao/Documents/Student%20Handbook%202016-2017.pdf and familiarize yourself with definitions and penalties (p. 33).

If you're in doubt about what constitutes plagiarism, ask your instructor because it is your responsibility to know. The American University of Beirut has a strict anti-cheating and anti-plagiarism policy. Penalties include failing marks on the assignment in question, suspension or expulsion from University and a permanent mention of the disciplinary action in the student's records.

- ✓ *Missed tests*

All tests must be completed within the time period specified; zero points will be given for an exam if the student does not adhere to the time guidelines. The only delays for the final exam that will be considered by the instructor are for documented illness, death in the family, and personal/family emergency.

- ✓ *Students with Disabilities:*

AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a disability (such as ADHD, learning difficulties, mental health conditions, chronic or temporary medical conditions), please do not hesitate to inform the Accessible Education Office. In order to ensure that you receive the support you need and to facilitate a smooth accommodations process, you must register with the Accessible Education Office (AEO) as soon as possible: accessibility@aub.edu.lb; +961-1-350000, x3246; West Hall, 314.

- ✓ *Non-Discrimination – Title IX – AUB*

*AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University's non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University's Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix. **To report an incident**, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb. An anonymous report may be submitted online via EthicsPoint at www.aub.ethicspoint.com.*

Detailed course outline

Please note this is a tentative schedule. Any changes may be made at the instructor's discretion.

Date	Topic	Reading	Course Objectives
June 11, 13, 18	Production of x – rays	PPT presentations and emailed articles.	1
June 20, 25	Interaction of x – rays with matter		2
June 28 July 2 , 5	Radioactivity		3
July 9, 12, 16, 19	Health Physics		4

References

- Bushberg T., Seibert J.A., Leidholdt Jr. E.M. and Boone J.M. (2012). The Essential Physics of Medical Imaging. 3rd ed., Lippincott Williams and Wilkins
- Dowsett D.J., Kenny P.A. and Johnston R.E. (2006). The Physics of Diagnostic Imaging. 2nd ed. Hodder Arnold.
- Bushong S.C. (2008). Radiologic Science for Technologists. 9th ed. Mosby Elsevier