



Syllabus

1. **Course name:** Biomedical Imaging Technology

2. **Course code:** BIIM332865

3. **Credits:** 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)

4. **Instructors**

a. Chief lecturer: Dr. Duong Thanh Tai

b. Co-lecturers: Assoc. Prof. Dr. Nguyen Thanh Hai

5. **Course Requirements:**

Prerequisite course(s): None

Previous course(s): None

6. **Course Description**

The course on Biomedical imaging technology provides learners with fundamental information and an overview of the structure, operating principles, and operating principles of standard medical imaging equipment. This basic information and overviews offer students a foundation for more in-depth study in the field of design, installation, operation, and maintenance of standard diagnostic imaging equipment in the medical system.

7. **Learning Outcomes (CLOs)**

CLOs	Descriptions	ELO(s) /PI(s)	Compe- tency
	<i>On successful completion of this course students will be able to:</i>		
CLO1	Apply fundamental scientific knowledge to comprehend and explain the construction and operation of various imaging devices such as X-ray, CT, SPECT, PET, etc.	ELO1/PI1.2	R M
CLO2	Evaluate, explain, and reason in order to address diagnostic imaging technology challenges.	ELO2/PI2.1	R
CLO3	Apply gained information to the teamwork process and contribute to the group's success.	ELO5/PI5.1	R
CLO4	Present, communicate and understand professional materials in English.	ELO6/PI6.3	R

8. **Content outline**

- *Overview and classification of medical imaging equipment*
- *Medical image quality parameters*
- *Principles of medical image acquisition, transmission, and processing system*
- *Basic concepts of atomic and nuclear physics*
- *Interaction of X-ray with matter*
- *Computerized tomography (CT) imaging*
- *Single-photon emission tomography (SPECT) imaging*
- *Positron emission tomography (PET) imaging*

9. **Teaching Methods**

- *Presentation*

- *Teamwork*

10. Assessment(s)

- Grading scale: **10**
- Assessment plan:

No.	Content	CLOs	Competency	Assessment methods	Assessment tools	Weighting %
Formative assessment						50
1.	Structure of X-ray tube, radiation interaction with matter	CLO1	R	Assignments	Score sheet (online)	10
2.	Structure, operating principle, image acquisition, image storage of the X-Ray, CT machine	CLO2	R	Assignments	Score sheet /Rubric (online)	20
3.	Structure, operating principle, image acquisition, image storage of the SPECT, PET machine	CLO2	R	Assignments		20
Summative assessment						50
4.	Students studied English papers and delivered presentations on the construction and operation of current imaging equipment.	CLO3/ PI4.2 CLO4/ PI7.2	R	Report	Rubric	50

11. Learning Materials:

- Textbook(s):
 - [1] Lecter give presentation material
 - [2] Jerrold T. Bushberg et. al., *The Essential Physics of Medical Imaging*, 2nd Ed., Lippincott Williams & Wilkins, 2002
- References:
 - [1] Robert Fosbinder et. Al., *Essentials of Radiologic Science*, Wolters Kluwer Health, 2012
 - [2] D.R. Dance et. al., *Diagnostic Radiology Physics: A Handbook for Teachers and Students*, international atomic energy agency (IAEA), 2014
 - [3] Perry Sprawls, *Physical Principles of Medical Imaging*, Medical Physics Pub Corp, 1993.

12. General Information:

Academic Integrity

All students in this class are subject to HCMUTE's Academic Integrity Policy (<http://sao.hcmute.edu.vn/>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. Any violations will be reported to the Faculty of Electrical and Electronic Engineering Dean's office.

Flexibility Notice

Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advanced notice. Students need to regularly update the information of their registered class.

Intellectual Property

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13. Approval Date: <dd/mm/yyyy>

14. Endorsement:

Dean	Head of Department	Chief Lecturer
Assoc. Prof. Dr. Nguyen Minh Tam	Assoc. Prof. Dr. Nguyen Thanh Hai	<Full Name>

15. Revision History:

1 st Revision: <dd/mm/yyyy>	Lecturer: Head of Department: Assoc. Prof. Dr. Nguyen Thanh Hai
2 nd Revision: <dd/mm/yyyy>	Lecturer: Head of Department: