COURSE INFORMATION					
Course Title	*Code*	*Semester*	*Lecture+Practice+Labrotory Hour*	*Credits*	*ECTS*
Nuclear Medicine (Clinical Clerkship)	MED 516	Phase 5 / 9-10	19+5	2	2*

* ECTS credits are the university credits of the courses in Yeditepe University, Faculty of Medicine, Undergraduate Medical Education Program

Prerequisites	The student that joins this course, should completed Phase 1, 2 , 3 and 4 courses of medical faculty.

Language of Instruction	English
Course Level	Second Cycle including First Cycle Degree (One Tier Programme)
Course Type	Compulsory
Course Coordinator	Prof. Dr. Nalan Alan Selçuk, MD.
The instructors	Nalan Alan Selçuk, MD Prof. Emine Biray Caner, MD Prof. Türkay Toklu, Ph.D.
Assistants	-
Goals	The course aims to equip necessary knowledge on nuclear medicine , working principles, nuclear physics, radiopharmacy, besides where, when and which technique is suitable or needed.

Learning Outcomes *At the end of this clerkship, the student should be able to:*	**Program Learning Outcomes**	**Teaching Methods**	**Assessment Methods**
1. ***List*** common indications for PET/CT and ***describe*** patient preparation of FDG PET/CT	1.1.7	1,2,3	A,C
2. ***Describe*** diagnostic imaging of infection or tumor.	1.1.7	1,2,3	A,C
3. ***Describe*** radionuclide therapy and its application areas	1.1.7 1.1.8 2.1.3 2.5.3 3.1.3	1,2,3	A,C
4. ***Describe*** physics of nuclear medicine and methods of projection	1.1.7	1,2,3	A,C
5. ***Describe*** gamma probe and its application method	1.1.7	1,2,3	A,C
6. ***Describe*** basic scintigraphy reading techniques	1.1.7	1,2,3	A,C
7. ***Demonstrate*** the ability to identify patient preparation requirements for specific diagnostic and therapeutic studies	1.1.8	1,2,3	A,C
8. ***Demonstrate*** knowledge of radiopharmaceuticals, their characteristics, and biodistribution that are used for specific nuclear medicine procedures.	1.1.8	1,2,3	A,C
9. ***Differentiate*** normal and basic pathological findings on common scintigraphy and PET images	1.1.7	1,2,3	A,C
10. ***Demonstrate*** the knowledge of personal radiation safety	1.1.8	1,2,3	A,C

11. ***Make*** examination of thyroid gland	2.1.1 2.1.3	1,2,3	A,C

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Discussion
Assessment Methods:	A: Testing B: Presentation C: Homework

COURSE CONTENT

Week	Topics	Study Materials
1	**Introductory Session** (Introduction to Nuclear Medicine)	Materials for the course provided by the the instructor
1	**Lecture** Basic Radiation Physics and Radiation Detectors in NM	Materials for the course provided by the instructor
1	**Lecture** Imaging Techniques in NM	Materials for the course provided by the instructor
1	**Laboratory** Radiopharmaceuticals, Gamma Camera, PET/CT, Thyroid Uptake System	Materials for the course provided by the instructor
1	**Lecture** NM In Hyperthyroidism	Materials for the course provided by the instructor
1	**Lecture** Renal Scintigraphy	Materials for the course provided by the instructor
1	**Lecture** Lung Perfusion and Ventilation Scintigraphy (V/Q Scan)	Materials for the course provided by the instructor
1	**Lecture** Non-FDG PET Tracers	Materials for the course provided by the instructor
1	**Lecture** Bone Scintigraphy and Other Tumor Agents	Materials for the course provided by the instructor
1	**Lecture** Other Conventional NM Applications	Materials for the course provided by the instructor
1	**Lecture** Introduction to PET Imaging	Materials for the course provided by the instructor
1	**Lecture** FDG-PET in Cancer	Materials for the course provided by the instructor
1	**Clinical Experience** PET Imaging	Materials for the course provided by the instructor
1	**Lecture** Radionuclide Therapy	Materials for the course provided by the instructor
1	**Lecture** NM In Thyroid Cancer	Materials for the course provided by the instructor
1	**Lecture** Myocardial Perfusion Scan and Cardiological PET Applications	Materials for the course provided by the instructor
1	**Lecture** Brain Imaging and Neurological PET Application	Materials for the course provided by the instructor
1	**Examination**	Materials for the course provided by the instructor
1	**Program Evaluation Session** Review of the Exam Questions, Evaluation of the Program	Materials for the course provided by the instructor

RECOMMENDED SOURCES	
Textbook	1- Nuclear Medicine: The Requisites 2- Essentials of Nuclear Medicine Imaging, by Drs. Fred A Mettler and Milton
Additional Resources	Lecture notes

ASSESSMENT		
Questions Types (Pencil-Paper Tests)	**Proportion (in Pass/Fail Decision)**	**Questions Types (Pencil-Paper Tests)**
Multiple Choice Questions	60%	Multiple Choice Questions
Essay Questions	10 %	Essay Questions
Modified Essay Questions	10%	Essay Questions
Short Response Essay Questions	20%	Essay Questions
Total	100%	**Total**
Other Assessment Methods and Tools	**Proportion (in Pass/Fail Decision)**	**Other Assessment Methods and Tools**
Structured Oral Exam (SOE)	30%	Structured Oral Exam (SOE)
Direct Observation of Procedural Skills (DOPS)	15%	
Evaluation of Case Presentation (With Checklist)	20%	
Evaluation of Preparation Skills of Patient's File (With Checklist)	15%	
Global Evaluation of Student's Performance (With Checklist)	20%	
Total	100 %	**Total**
Pass/Fail Decision	**Proportion (in Pass/Fail Decision)**	Pass/Fail Decision
Pencil-Paper Tests	70%	Pencil-Paper Tests
Other Assessment Methods and Tools	30%	Other Assessment Methods and Tools
Total	%100	**Total**

MATERIAL SHARING	
Documents	Photocopy shareable.
Assignments	Not Shareable
Exams	Not shareable

COURSE CATEGORY	Expertise/Field Courses

COURSES CONTRIBUTION TO PROGRAM					
COMPETENCE AREA-1 / Professional Practices	**Contribution**				
COMPETENCE 1.1. Health Service Provider	**1**	**2**	**3**	**4**	**5**
Competency 1.1.1. Integrates knowledge, skills, and attitudes acquired from basic and clinical medical sciences, behavioral sciences, and social sciences to provide health services.					
Competency 1.1.2. Demonstrates a biopsychosocial approach that considers the individual's sociodemographic and sociocultural background without discrimination based on language, religion, race, or gender in patient management.					
Competency 1.1.3. Prioritizes the protection and improvement of individuals' and community's health in the delivery of healthcare services.					
Competency 1.1.4. Performs the necessary actions in the direction of maintaining and improving the state of health as considering the individual, social, social and environmental factors affecting health.					
Competency 1.1.5. Provides health education to healthy/ill individuals and their families, as well as to other healthcare professionals, by recognizing the characteristics, needs, and expectations of the target audience.					
Competency 1.1.6. Demonstrates a safe, rational, and effective approach in the processes of protection, diagnosis, treatment, follow-up, and rehabilitation in health service delivery.					
Competency 1.1.7. Performs interventional and/or non-interventional procedures safely and effectively for the patient in the processes of diagnosis, treatment, follow-up, and rehabilitation.					**X**
Competency 1.1.8. Provides healthcare services considering patient and employee health and safety.					**X**
Competency 1.1.9. Considers changes related to the physical and socio-economic environment at both regional and global scales that affect health, as well as changes in the individual characteristics and behaviors of those who seek healthcare services.					
COMPETENCE AREA-2 / Professional Values and Approaches	**Contribution**				
COMPETENCE 2.1. Adopting Professional Ethics and Principles	**1**	**2**	**3**	**4**	**5**
Competency 2.1.1. Considers good medical practices while performing the profession.					**X**
Competency 2.1.2. Fulfills duties and obligations within the framework of ethical principles, rights, and legal responsibilities required by the profession.					
Competency 2.1.3. Demonstrates determined behavior in providing high-quality healthcare while considering the patient's integrity.					**X**
Competency 2.1.4. Evaluates own performance in professional practices by considering own emotions and cognitive characteristics.					
COMPETENCE 2.2. Health Advocate					
Competency 2.2.1. Advocates for the improvement of healthcare service delivery by considering the concepts of social accountability and social responsibility in the protection and enhancement of community health.					
Competency 2.2.2. Plans and implements service delivery, education, and counseling processes related to individual and community health, in collaboration with all stakeholders, for the protection and improvement of health.					

Competency 2.2.3. Evaluates the impact of health policies and practices on individual and community health indicators and advocates for the improvement of healthcare quality.					
Competency 2.2.4. Gives importance to protecting and improving own physical, mental, and social health and takes necessary actions for it.					
COMPETENCE 2.3. Leader-Manager					
Competency 2.3.1. Demonstrates exemplary behavior and leadership within the healthcare team during service delivery.					
Competency 2.3.2. Utilizes resources in a cost-effective, socially beneficial, and compliant manner with regulations in the planning, implementation, and evaluation processes of healthcare services as the manager in the healthcare institution.					
COMPETENCE 2.4. Team Member					
Competency 2.4.1. Communicates effectively within the healthcare team and takes on different team roles as necessary.					
Competency 2.4.2. Displays appropriate behaviors while being aware of the duties and responsibilities of healthcare workers within the healthcare team.					
Competency 2.4.3. Works collaboratively and effectively with colleagues and other professional groups in professional practice.					
COMPETENCE 2.5. Communicator					
Competency 2.5.1. Communicates effectively with patients, their families, healthcare professionals, and other occupational groups, institutions and organizations.					
Competency 2.5.2. Communicates effectively with individuals and groups who require a special approach and have different sociocultural characteristics.					
Competency 2.5.3. Demonstrates a patient-centered approach that involves the patient in decision-making mechanisms during the diagnosis, treatment, follow-up, and rehabilitation processes.					
COMPETENCE AREA-3 / Professional and Personal Development	**Contribution**				
COMPETENCE 3.1. Scientific and Analytical Approach	**1**	**2**	**3**	**4**	**5**
Competency 3.1.1. Plans and implements scientific research, as necessary, for the population it serves, and utilizes the results obtained, as well as those from other research, for the benefit of the community.					
Competency 3.1.2. Accesses and critically evaluates current literature related to their profession.					
Competency 3.1.3. Applies evidence-based medicine principles in the clinical decision-making process.					**X**
Competency 3.1.4. Uses information technologies to enhance the effectiveness of healthcare, research, and education activities.					
COMPETENCE 3.2. Lifelong Learner					
Competency 3.2.1. Manages effectively individual study processes and career development.					
Competency 3.2.2. Demonstrates skills in acquiring, evaluating, integrating new information with existing knowledge, applying to professional situations, and adapting to changing conditions throughout professional career.					
Competency 3.2.3. Selects the right learning resources to improve the quality of health care and organizes the learning process.					

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity/ day	Duration (Hour)	Total Workload (Hour)
Course Duration (1 week)	5	5	25
Hours for off-the-classroom study (Pre-study, practice, review/week)	5	3	15
Homework	4	2	8
Exam	1	2	1
Total Work Load			49
Total Work Load / 30 (h)			1.63
ECTS Credit of the Course			2