DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
EBT316	3			6
Title	**T**	**A**	**L**	**ECTS**
Nuclear Energy	3	2	0	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Energy Science and Technology					
Forms of Teaching and Learning	Face-to-face					
Course Type	**Compulsory**		**Elective**	**X**		
Objectives	The main topics of nuclear engineering education, such as reactor physics, reactor technology, reactor safety, health physics, radiation physics, and technology, will be examined.					
Content	The course covers radiation physics and technology, nuclear reactor systems and their types, fundamental reactor physics, criticality calculations, fuel cycles, reactivity changes, reactor kinetics, instrumentation and control, radiation protection, and reactor safety.					
Prerequisites	-					
Coordinator	Asst. Prof. Dr. Elif Yunt					
Lecturer(s)	Asst. Prof. Dr. Elif Yunt					
Assistant(s)						
Work Placement	None					

Recommended or Required Reading	
Books / Lecture Notes	Einführung in die Kernphysik, Harry Friedmann, Wiley, J.R., Baratta, A.J., Introduction to Nuclear Engineering, Lamarsh, 3rd Edition, Prentice-Hall.
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		%
Engineering	50	%
Engineering Design		%
Social Sciences		%

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Educational Sciences		%
Natural Sciences	50	%
Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	40
Quiz	4	20
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	40
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	10	9	90
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	4	4
Recitations	14	2	28
Laboratory			
Projects			
Final Exam	1	4	4
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	Students gain knowledge about nuclear technologies.
2	Students acquire information about radiation, radiation units, and their applications.
3	Students learn about radiation safety.
4	Students gain knowledge about nuclear energy production.
5	Students become familiar with the terminology of nuclear technologies.
6	Students acquire fundamental knowledge about energy production through nuclear fission.
7	Students understand the formation and consequences of nuclear reactions.

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8	Students gain basic knowledge about nuclear safety and waste management.
Weekly Content	
1	Nuclear physics terminology
2	Definition of radiation, its units, measurement, and applications
3	Radiation safety
4	Radioactivity
5	Concept of nuclear reaction
6	Neutron particles and their interactions with matter
7	Nuclear fission
8	Midterm exam
9	Nuclear energy production units
10	Nuclear energy production units
11	Operation of nuclear reactors
12	Types of nuclear reactors
13	Types of nuclear reactors
14	Nuclear fuel cycles and waste management
15	Nuclear fuel cycles and waste management
16	Final Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	5	5	5	2	5				
2	5	5	5	2	5				
3	5	5	5	2	5				
4	5	5	5	2	5				
5	5	5	5	2	5				
6	5	5	5	2	5				
7	5	5	5	2	5				
8	5	5	5	2	5				
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High								

Compiled by:	
Date of Compilation:	