Courses and ECTS Credits

1ᵗʰ Year					
Code	Course Name	ECTS	T+P+L	Z/S	Language
Autumm Term					
121311206	Physics I (Mechanic)	7	4+2+0	Z	Turkish
121311207	Physics Lab. I	2	0+0+2	Z	Turkish
121311208	Introduction to Physics	2	2+0+0	Z	Turkish
121311209	General Chemistry I	4	4+0+0	Z	Turkish
121311210	General Chemistry Lab. I	2	0+0+2	Z	Turkish
121311211	Analysis I	5	4+2+0	Z	Turkish
121311212	Occupational Health and Safety I	2	2+0+0	Z	Turkish
121311195	Turkish Language I	2	2+0+0	Z	Turkish
121311196	English I	3	3+0+0	Z	English
	Social Selective I (One Course must be selected!)	1	1+0+0	S	Turkish
Autumn Term Summation:					
Spring Term					
121312195	Physics II (Electric and Magnetism)	7	4+2+0	Z	Turkish
121312196	Physics Lab. II	2	0+0+2	Z	Turkish
121312197	Physics and Technology	2	2+0+0	Z	Turkish
121312198	General Chemistry II	4	4+0+0	Z	Turkish
121312199	General Chemistry Lab. II	2	0+0+2	Z	Turkish
121312200	Analysis II	5	4+2+0	Z	Turkish
121312201	Occupational Health and Safety II	2	2+0+0	Z	Turkish
121312185	Turkish Language II	2	2+0+0	Z	Turkish
121312186	English II	3	3+0+0	Z	English
	Social Selective II (One Course must be selected!)	1	1+0+0	S	Turkish
Spring Term Summation:					
1ˢᵗ year totally:					

2nd Year					
Code	Course Name	AKTS	D+U+L	Z/S	Language
Autumm Term					
121313311	Waves and Optics	6	4+0+0	Z	Turkish
121313312	Waves and Optic Laboratory	2	0+0+2	Z	Turkish
121313313	Mathematical Methods in Physics I	6	4+0+0	Z	Turkish
121313314	Differential Equations I	4	3+0+0	Z	Turkish
121313315	Computer Programming	5	2+2+0	Z	Turkish
	History of Turkish Revolution & Principles of M. Kemal Atatürk I	2	2+0+0	Z	Turkish
	Elective Course (Alan Seçmeli) I	2	2+0+0	S	Turkish
	Elective Course (Alan Dışı Seçmeli) I	3	2+0+0	S	Turkish
Autumn Term Summation:					
Spring Term					
121314310	Modern Physics	5	3+0+0	Z	Turkish
121314311	Modern Physics Laboratory	2	0+0+2	Z	Turkish
121314312	Mathematical Methods in Physics II	6	4+0+0	Z	Turkish
121314313	Differential Equations II	4	3+0+0	Z	Turkish
121314314	Introduction to Electronics	4	3+0+0	Z	Turkish
121314315	Introduction to Electronics Lab.	2	0+0+2	Z	Turkish
121314298	History of Turkish Revolution & Principles of M. Kemal Atatürk II	2	2+0+0	Z	Turkish
	Elective Course (Alan Seçmeli) II	2	2+0+0	S	Turkish
	Elective Course (Alan Dışı Seçmeli) II	3	2+0+0	S	Turkish
Spring Term Summation:					
2nd year totally:					

3th Year					
Code	Course Name	AKTS	D+U+L	Z/S	Language
Autumm Term					
121315413	Quantum Physics I	7	4+0+0	Z	Turkish
121315414	Classical Mechanics	7	4+0+0	Z	Turkish
121315415	Electromagnetic Theory	7	4+0+0	Z	Turkish
	Elective Course (Alan Seçmeli) III	7	3+0+0	S	Turkish
	Elective Course (Alan Seçmeli) IV	4	3+0+0	S	Turkish
Autumn Term Summation:					
Spring Term					
121316353	Quantum Physics II	7	4+0+0	Z	Turkish
121316354	Nuclear Physics	7	4+0+0	Z	Turkish
121316355	Thermodynamic and Statistical Physics	7	4+0+0	Z	Turkish
	Elective Course (Alan Seçmeli) V	5	3+0+0	S	Turkish
	Elective Course (Alan Seçmeli) VI	4	3+0+0	S	Turkish
Spring Term Summation:					
3th year totally:					

4th Year					
Code	Course Name	AKTS	D+U+L	Z/S	Language
Autumm Term					
121317xxx	Applications of Fundamental Field	8	0+6+0	S	Turkish
121317xxx	Elective Courses of Fundamental Field (AMP-SSP-...)	7	4+0+0	S	Turkish
	Elective Course (Alan Seçmeli) VII	5	3+0+L	S	Turkish
	Elective Course (Alan Seçmeli) VIII	5	3+0+0	S	Turkish
	Elective Course (Alan Seçmeli) IX	5	3+0+0	S	Turkish
Autumn Term Summation:					
Spring Term					
121318xxx	Internship	30	0+0+0	Z	Turkish
Spring Term Summation:					
4th year totally:					

ESOGU Physics Department Course Information Form

COURSE CODE: 121311206

COURSE NAME: PHYSICS-I (Mechanic)

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	5	0	5	7	COMPULSORY (**X**) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)						

PREREQUISIT(S) IF ANY	
SHORT COURSE CONTENT	Measurement; vectors; motion along a straight line; motion in two and three dimensions; force and motion I; force and motion II; kinetic energy and work; conservation of energy; center of mass and linear momentum; rotation; rolling, torque and angular momentum; equilibrium
OBJECTIVES OF THE COURSE	The main object of the course is to provide a basic understanding of Newtonian mechanics and conservation laws.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Apply and link the gained knowledge of natural sciences to interdisciplinary fields. Correlate and apply gained knowledge directly with technology and industry.
LEARNING OUTCOMES OF THE COURSE	Identify, formulate, and solve problems analytically that appear in physical systems. Analyze and resolve natural phenomenon. Associate the gained knowledge, analyze and interpret data
MAIN TEXTBOOK	**Sears and Zemansky's** UNIVERSITY PHYSICS WITH MODERN PHYSICS 12TH Edition, PEARSON Addison Wesley (2008).
SUPPORTING REFERENCES	**Halliday, D. , Resnick, R., & Walker, J. (2006) 6th ed.** Fundamentals of Physics. New York: John Wiley & Sons, Inc. **Serway, R.A. (1990).** Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Unit systems, dimensions, measurements
2	Vectors
3	Motion in one dimension
4	Motion in two dimensions
5	Midterm Exam 1
6	Dynamic
7	Circular motion
8	Work and kinetic energy
9	Potential energy and conservation of energy
10	Midterm Exam 2
11	Impulse and linear momentum
12	Collisions
13	Rotational motion of rigid objects
14	Equilibrium
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		X			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		X			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		X			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		X			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.			X		
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		X			
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.		X			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.			X		

Prepared by:

Signature(s):   **Date:**

ESOGU Physics Department Course Information Form

COURSE CODE: 121311207   **COURSE NAME:** Physics Lab. I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	0	2	1	2	COMPULSORY (**X**) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam			Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		50
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM					1	50
MAKE UP EXAM (Oral/Written)				Written		

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Newton's Laws, elastic spring, viscosity, moment of inertia, collisions.
OBJECTIVES OF THE COURSE	learning the basic principles and concepts of physics
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To use existing technology and to produce new technologies.
LEARNING OUTCOMES OF THE COURSE	To explain natural phenomena and analysis learn the science of physics, Understanding of scientific method and research skills.
MAIN TEXTBOOK	PHYSICS-I EXPERIMENTS (2004). Eskişehir: ESOGU Printing House.
SUPPORTING REFERENCES	Serway, R.A. (1990). Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing. Halliday, D. , Resnick, R., & Walker, J. (2006) 6th ed. Fundamentals of Physics. New York: John Wiley & Sons, Inc. Sears & Zemansky (2008). UNIVERSTY PHYSICS WITH MODERN PHYSICS, PEARSON. Ekem, N., Şenyel, M. Fizik I-II Deneyleri. Eskişehir: T.C. Eskişehir Osmangazi Üniversitesi Yayınları, No:23.
NECESSARY COURSE MATERIALS	Calculator, Ruler, Graph Paper.

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Measurement
2	Newton's first law
3	Newton's second law
4	Newton's third law
5	Midterm Exam 1
6	Elastic collision
7	Conversation of energy
8	The mechanical equivalent of heat
9	Frictional torque
10	Midterm Exam 2
11	Moment of inertia
12	Hook's law and elastic spring
13	Viscosity
14	
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	X				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		X			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	X				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.		X			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		X			
12	To have knowledge about the modern problems that are local and global.			X		

Prepared by:　　　　　　　　　　　　　　　　**Signature(s)**:　　**Date:**

ESOGU Physics Department Course Information Form

COURSE CODE: 121311208   **COURSE NAME:** Introduction to Physics

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	2	0	2	2	COMPULSORY ( ) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
2	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam	2	50	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Overview of Physical Sciences; History and development; the lower branches of physics; counting and measuring; error types; Basic Quantities; Length, Mass, and Time Standards; Unit Systems; density and atomic mass; Size Analysis; Unit Relations and Transformations; Significant Figures; Mathematical notation; Graphic Analysis.
OBJECTIVES OF THE COURSE	The development of physical science of students, some important basic concepts and terms related to the profession, education and professional life of the unit systems will need to constantly, units and conversions, to learn some common rules to be considered for problem solving, knowledge and insight to recognize and ensure the basic concepts of physics.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	At the end of this course, basic research methods used in physics and will learn about basic research systems that recognize and use
LEARNING OUTCOMES OF THE COURSE	1. Defines the science of physics, the current state of development of the associate recalls. 2. The course explains the basic concepts of some of the physical sciences; around the live event, the case relates to these concepts and situations. 3. Understands the importance of the unit, the unit systems allow their associates and apply transformations. 4. Remember the general rules to be considered in problem solving. 5. Defines the concept of ethics, ethics and morality with the law, says that the differences between the concepts.
MAIN TEXTBOOK	General Physics books, laboratory books
SUPPORTING REFERENCES	All kinds of relevant sources
NECESSARY COURSE MATERIALS	Computer, projector

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Overview of the sciences of physics, branches of physics
2	Counting and Measuring; Significant Figures; of mathematical notation; Graphical Analysis
3	Basic Quantities; Length, Mass, and Time Standards; Unit Systems
4	Density and Atomic Mass
5	Midterm Exam 1
6	Error Types
7	Dimensional Analysis, Volume Relations and Transformations
8	Significant Figures; Mathematical Views
9	graphical Analysis
10	Materials
11	Midterm Exam 2
12	Structure of Materials
13	Properties of Materials
14	Mechanical Properties
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)						
NO	**PROGRAM OUTCOME**	**5**	**4**	**3**	**2**	**1**
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.			X		
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			X		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		X			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		X			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	X				
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.			X		

Prepared by:

Signature(s):

ESOGU Physics Department Course Information Form

COURSE CODE: 121311209   **COURSE NAME:** Chemistry-I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	3	0	3	3	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Properties and measurement of matter; atoms and the atomic theory; chemical compounds; chemical reactions; reactions in aqueous solutions; gases; thermochemistry; electrons in atoms; the periodic table; chemical bonding. liquids, solids and inter molecular forces.
OBJECTIVES OF THE COURSE	The main aim of the course is about knowing fundamental aspects of chemistry.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Ability to apply the knowledge of physics and chemistry
LEARNING OUTCOMES OF THE COURSE	1.Define matter and chemistry and state the major concerns of this science. 2.Gives examples of chemical reactions, describing the features that characterize them.
MAIN TEXTBOOK	Jones, L. and Atkins, P. (2000). Chemistry, 4th Edition, W.H.Freeman and Company, New York, USA.
SUPPORTING REFERENCES	1.Petrucci, R., Harwood, W.S. and Herring, F.G. (2002). General Chemistry, 8th Edition, Prentice Hall, USA. 2.Ebbing, D.D., Wentworth, R.A.D. and Birk, J.P. (1995). Introductory Chemistry, Houghton Mifflin Company, USA.
NECESSARY COURSE MATERIALS	Computer and data show

COURSE SCHEDULE

WEEK	SUBJECTS
1	Properties and measurement of matter
2	atoms and the atomic theory
3	atoms and the atomic theory
4	chemical compounds chemical reactions
5	Midterm Exam 1
6	reactions in aqueous solutions
7	gases
8	thermochemistry
9	electrons in atoms
10	Midterm Exam 2
11	the periodic table
12	chemical bonding
13	liquids, solids and inter molecular forces
14	Solution and their physical characteristic
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		x			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		x			
9	Ethical and professional responsibility.			x		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.			x		

Prepared by:

Signature(s):   **Date:**

ESOGU Physics Department Course Information Form

COURSE CODE: 121311210

COURSE NAME: CHEMISTRY LAB. I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	0	2	1	2	COMPULSORY ( ) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam			Midterm Exam	-	-
	Quiz			Experimenting Performance	10	1
	Homework			Reporting	10	2.5
	Project			Oral Exam or Quiz	10	2.5
	Other (………)			Other (………)		
FINAL EXAM					1	40
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Introduction of laboratory equipments, Determination of density, Conservation of mass, Law of definite proportions, Molar volume of a gas and determination of ideal gas constant, Relative diffusion rate of gasses, Chemical equilibrium, Metals and sulfuric acid reactions
OBJECTIVES OF THE COURSE	The aim of this course is to teach students how to set up an experiment related with the content of this course and to teach the basic concept in chemistry
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To provide professional qualification on this course and provide the ability to follow the knowledge in contemporary issues and the ability on research and learn scientific method and to design and set up experiment in the laboratory.
LEARNING OUTCOMES OF THE COURSE	At the end of the course, students will be able to synthesis the knowledge on science with the content of this course and analyze and estimate the data in the related scientific problem
MAIN TEXTBOOK	Laboratory notes (prepared by the department members)
SUPPORTING REFERENCES	Genel Kimya Laboratuvarı (Doç.Dr.Hülya Güler, Yrd.Doç.Dr.Dursun Saraydın, Yrd.Doç.Dr. Ulvi Ulusoy)
NECESSARY COURSE MATERIALS	Computer and data show device

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Introduction of laboratory equipments

2	Determination of density
3	Determination of density
4	Conservation of mass
5	Midterm Exam 1
6	Law of definite proportions
7	Law of definite proportions
8	Molar volume of a gas and determination of ideal gas constant
9	Molar volume of a gas and determination of ideal gas constant
10	Midterm Exam 2
11	Relative diffusion rate of gasses
12	Chemical equilibrium
13	Chemical equilibrium
14	Metals and sulfuric acid reactions
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.		X			
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.	X				
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.				X	
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.					
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		X			
9	Ethical and professional responsibility.		X			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.					X
12	To have knowledge about the modern problems that are local and global.		X			

ESOGU Physics Department Course Information Form

COURSE CODE: 121311211　　　　　　　　　　　　　**COURSE NAME:** Analysis-I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	4	0	4	4	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
5	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Introductıon (Real numbers and complex numbers, Functions, Graphs, Trigonometric and inverse trigonometric functions, Limits and continuity) Derivatives (Derivatives of elementer functions, Derivatives of logaritmic functions, Derivatives of exponentials functions, Derivatives of Hyperbolic functions, Derivatives of Inverse functions, Slope of Curves, Exstreme Values, Asymtots, Graphs of functions, Polar Coordinates and Graphs ın Polar Coordinates.
OBJECTIVES OF THE COURSE	The main of the course is to introduce the concepts and techniques involved in the basic topics listed in this lecture and to develope skills in applying those concepts and techniques to the solution of problems
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Gain the ability of problem solution.
LEARNING OUTCOMES OF THE COURSE	Gain sufficient knowledge of Analysis subject, related with science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of problems.
MAIN TEXTBOOK	Genel matematik-I, Prof Dr. Ali Görgülü
SUPPORTING REFERENCES	Analiz-I, Prof. Dr. Mahmut Koçak Analiz-I Prof Dr.Mustafa Balcı Genel matematik-I, Prof Dr. H:H:Hacısalihoğlu; Prof Dr.Mustafa Balcı
NECESSARY COURSE MATERIALS	

**COURSE SCHEDULE**
WEEK	**SUBJECTS**
1	Basic Properties of Real Numbers
2	complex numbers, Functions, Graphs
3	Trigonometric and inverse trigonometric functions,
4	Logaritmic functions, exponentials functions, Hiperbolic functions,
5	Midterm Exam 1
6	Limits and Continuity,
7	Problem solving,
8	Derivatives of elementer functions, Derivatives of logaritmic functions, Derivatives of exponentials functions,
9	Derivatives of Hyperbolic functions, Derivatives of Inverse functions,
10	Midterm Exam 2
11	Applications of the derivative, maximum and minimum values,
12	Asymtots,, Graphs of functions
13	Polar Coordinates and Graphs ın Polar Coordinates
14	Problem solving,
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.			x		
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			x		
9	Ethical and professional responsibility.			x		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.			x		

Prepared by:

Signature(s):   **Date:**

ESOGU Physics Department Course Information Form

COURSE CODE: 121311212　　　　　　**COURSE NAME:** Occupational Health and Safety I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	2	0	2	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
5	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam			Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM						
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	
OBJECTIVES OF THE COURSE	
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	.
LEARNING OUTCOMES OF THE COURSE	
MAIN TEXTBOOK	
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

WEEK	SUBJECTS
**COURSE SCHEDULE**	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.					
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.					
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.					
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.					
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.					
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.					
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.					
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.					
9	Ethical and professional responsibility.					
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.					
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.					
12	To have knowledge about the modern problems that are local and global.					

Prepared by:

Signature(s):   **Date:**

ESOGU Physics Department Course Information Form

COURSE CODE: 121311195   **COURSE NAME:** TURKISH LANGUAGE I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	2	0	0	2	Selective

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
			2

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	1	40	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	(WRİTTEN)					

PREREQUISIT(S) IF ANY	---
SHORT COURSE CONTENT	Description and features of language, languages of the world, Position of Turkish among other languages, historical development of Turkish, development of western Turkish, Atatürk's ideas and projects on Turkish, pronunciation and punctuation, language policies.
OBJECTIVES OF THE COURSE	The subject of the course is to expose the value of Turkish language by giving information about development of Turkish language, to gain national language awareness, to develop reading and writing skills, to compare and contrast Turkish language to other languages, to compare and contrast language policy of developed countries to Turkish language policy, to gain skill of speaking.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Develop the ability of using Turkish properly at the business life.
LEARNING OUTCOMES OF THE COURSE	Learn Turkish grammar Gain an understanding of the position of Turkish among other languages Gain an understanding of history of Turkish language Gain knowledge about Turkish languages in the world Develop the ability of using Turkish properly Learn the language policies Gain writing skill Gain speaking skill Learn sentence structure and analyzing Be able to realize Turkish vowels Be able to realize formation of Turkish Be able to read and comprehend Be able to speak simultaneously Be able to write compositions
MAIN REFERENCES	1. Kültür, M. E., "Üniversiteler İçin Türk Dili", Bayrak Yayınları, İstanbul, 1997. 2. "Türk Dil Yazım Kılavuzu", TDK Yayınları, 24. baskı, Ankara, 2005

SUPPORTING REFERENCES	1. Kaplan, M., "Kültür ve Dil", 8. baskı, ,Dergah Yayınları, İstanbul, 1993. 2. Fuat, M., "Dil Üstüne", Adam Yayınları, İstanbul, 2001. 3. Ercilasun, A. B., "Başlangıçtan Yirminci Yüzyıla Türk Dili Tarihi", Akçağ Yayınları, 1. baskı, Ankara, 2004. 4. Aksan, D., "Türkçe'nin Gücü", Bilgi Yayınevi, 4. baskı, Ankara, 1997. 5. Karamanlıoğlu, A., "Türk Dili", Degah Yayınları, 3. baskı, İstanbul, 1984. 6. Anday, M. C., "Dilimiz Üstüne Konuşmalar", YKY, İstanbul, 1996. 7. Karaağaç, G., "Dil Tarih ve İnsan", Akçağ Yayınevi, Ankara, 2002. 8. Aksan, D., "Dil Şu Büyülü Düzen", Bilgi Yayınevi, Ankara, 2003. 9. Banarlı, N. S., "Türkçe'nin Sırları", 18. baskı, Kubbealtı Neşriyatı, İstanbul, 2002
NECESSARY COURSE MATERIALS	DVD, VCD, projection, computer

ESOGU Physics Department Course Information Form

COURSE CODE: 121311196   **COURSE NAME**: ENGLISH I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
1	3	0	0	3	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)						

PREREQUISIT(S) IF ANY	
SHORT COURSE CONTENT	Elementary- General English.
OBJECTIVES OF THE COURSE	To make students express themselves at elementary level and enable them for technical English in upper classes.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Getting the elemantary level which constitute the base of the language can contribute to better understanding of the reading materials of the students in their field.
LEARNING OUTCOMES OF THE COURSE	At the end of the education year, students can acquire reading, writing and speaking skills at elementary level.
MAIN TEXTBOOK	NUMBER ONE (elementary) Data publications.
SUPPORTING REFERENCES	Dictionaries, grammar books.
NECESSARY COURSE MATERIALS	CDs, CD player, overhead projector.

COURSE SCHEDULE

WEEK	SUBJECTS
1	The alphabet, To be(present), Numbers
2	Singulars and plurals, This/That,
3	Simple present tense, adverbs of frequency
4	Telling the time, Likes and dislikes
5	Midterm exam 1
6	Have got/has got
7	Should (advice)
8	There is/there are, Present progressive, Prepositions of place
9	Shouldn't, Can,
10	Midterm exam 2
11	Have to/has to (obligation)
12	Simple past tense (irregular verbs)
13	Be going to, comparatives-superlatives, Cauntable-uncountable
14	Should, had beter, must
15,16	Final exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.				X	
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.				X	
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.				X	
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		X			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.				X	
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		X X			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		X			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		X			
9	Ethical and professional responsibility.		X			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.		X			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		X			
12	To have knowledge about the modern problems that are local and global.		X			

ESOGU Physics Department Course Information Form

COURSE CODE: 121312195   **COURSE NAME:** PHYSICS II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	5	0	5	7	COMPULSORY (**X**) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week) of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
5	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
MIDTERM	**Activity type**	**Number**	**%**	**Activity type**	**Number**	**%**
	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Electrostatic and Coulomb's law, Electric Field, Electric Potential, Gauss's law, Electric current and ohm's law, Capacitance and dielectrics, Direct-Current Circuits and Kirchoff's Rules, Magnetic Field and Magnetic Forces, Biot–Savart law, Faraday's law, Lenz's law, Electromagnetic waves, Maxwell's equations.
OBJECTIVES OF THE COURSE	The main object of the course is to introduce fundamental concepts and principles related to the electricity and magnetism and provide an understanding of these principles with applications from the real world
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Analyze and resolve natural phenomenon. Associate the gained knowledge, analyze and interpret data.
LEARNING OUTCOMES OF THE COURSE	Know fundamental concepts and principles related to the electricity and magnetism. Identify, formulate, and solve problems analytically that appear in physical systems.
MAIN TEXTBOOK	Sears and Zemansky's UNIVERSITY PHYSICS WITH MODERN PHYSICS 12TH Edition, PEARSON Addison Wesley (2008).
SUPPORTING REFERENCES	**Halliday, D. , Resnick, R., & Walker, J. (2006) 6th ed.** Fundamentals of Physics. New York: John Wiley & Sons, Inc. **Serway, R.A. (1990).** Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Electrostatic and Coulomb's law
2	Electric Field and Gauss's law
3	Electric Potential
4	Capacitance and dielectrics
5	Midterm Exam 1
6	Electric current and ohm's law
7	Direct-Current Circuits and Kirchoff's Rules
8	Magnetic Field and Magnetic Forces
9	Sources of Magnetic Field
10	Midterm Exam 2
11	Faraday's law
12	Electromotor force and Lenz's law
13	Electromagnetic waves
14	Maxwell's equations
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		X			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		X			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		X			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		X			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.			X		
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		X			
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.		X			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.			X		

ESOGU Physics Department Course Information Form

COURSE CODE: 121312196　　　　**COURSE NAME:** Physics Lab. II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	0	2	1	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam			Midterm Exam	2	25
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM					1	50
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Fundamental concepts of electromagnetism, Electrolysis, Frequency exploration, Ohm's Law, Wheatstone Bridge, Electromagnetic Induction, RC circuits, Magnetic field due to current carrying conductor, Electrical equivalence of heat.
OBJECTIVES OF THE COURSE	Teaching the applications of electromagnetism
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Applications of the theoretical knowledge of electromagnetism
LEARNING OUTCOMES OF THE COURSE	
MAIN TEXTBOOK	Fizik I ve Fizik II deneyleri Laboratuar kitabı, E. Aral,V. Bilgin, G. Kılıç ve U.G. İşsever.
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Fundamental concepts of electromagnetism
2	Electrolysis
3	Frequency exploration I, Frequency exploration II
4	Ohm's Law I (resistance, current and potential), Ohm's Law II (circuits)
5	Midterm Exam 1
6	Wheatstone Bridge I , Wheatstone Bridge II
7	Electromagnetic Induction I, Electromagnetic Induction II (experimental measurements)
8	RC circuits I (measurements)
9	RC circuits II (calculations and graphical methods)
10	Midterm Exam 2
11	Magnetic field due to current carrying conductor
12	Earth's magnetic field calculation by using current carrying conductor
13	Electrical equivalence of heat
14	A filament's yield
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.		x			
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		x			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	x				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		x			
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.			x		

ESOGU Physics Department Course Information Form

COURSE CODE: 121312197   **COURSE NAME:** Physics and Technology

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	2	0	2	2	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
2	()		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	1	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework	1	25	Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					
PREREQUISIT(S) IF ANY	-					

SHORT COURSE CONTENT	Information systems; what is a computer; introduction to computers and basic parts of a computer; number systems; operating systems; Algorithms; Windows XP operating system; computer networks and internet; Word, Excel and their applications; word processing pocket programmers: use of ms word and its properties; use of ms excel and its properties; operate the data; draw a graphic of a data; transfer a data; Applications: use of computers in physics laboratory experiments; methods of preparing a presentation and an experiment report by computers and their examples; scientific research methods in internet for physics homework and projects; use of databases of our university website.
OBJECTIVES OF THE COURSE	The main aim of the course is to introduce basic information systems and technologies required in the other courses of physics and of physical researches.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Computer applications to simulate the physical environment, using computer programs to perform the solution of physical problems, the student will give a different perspective.
LEARNING OUTCOMES OF THE COURSE	Identify, formulate, and solve field related problems, Design and conduct experiments as well as to analyze and interpret data, Realize an ability of the scientific research and methods, Use new technology and modern techniques such as computer and computer software to analyze and model the scientific problems, Use Microsoft word, excel, power point applications.
MAIN TEXTBOOK	
SUPPORTING REFERENCES	**Ertaş, İ. (1984).** Denel Fizik Dersleri (cilt 1). İzmir: Barış Yayınları **Wildi, T. (1995).** Metric Units and Conversion Charts. New York: McGraw-Hill Co. **Yıdız, F., et al. (2001).** Temel Bilgisayar Bilimleri. İstanbul: Atlas yayın dağıtım. **Fishbane, P.M., Gasiorowicz, S. & Thornton, S.T. Çeviri: Yalçın, C. (2003).** Temel Fizik. Ankara: Arkadaş Yayınevi. **Keller, F. J. et al. Çeviri: Akyüz, R.Ö. et al. (2002).** Fizik. McGraw-Hill-Literatür Yayınla
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE

WEEK	SUBJECTS
1	Information systems; what is a computer; introduction to computers and basic parts of a computer
2	Number systems; operating systems; Algorithms
3	Windows XP operating system; computer networks and internet
4	Word, Excel and their applications; word processing pocket programmers: use of ms word
5	Midterm Exam 1
6	Use of ms excel and its properties; operate the data
7	Draw a graphic of a data; transfer a data; Applications
8	Use of computers in physics laboratory experiments; methods of preparing a presentation and an experiment report by computers and their examples
9	Scientific research methods in internet for physics homework and projects
10	Midterm Exam 2
11	Use of databases of our university website.
12	EXCEL applications
13	EXCEL applications
14	EXCEL applications
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.					
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.					
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.					
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				
9	Ethical and professional responsibility.					
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.					
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.					

COURSE CODE: 121312198   **COURSE NAME:** Chemistry II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	3	0	3	3	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam	2	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Solutions and their physical properties, chemical kinetics; principles of chemical equilibrium; acids and bases; acid-base equilibria; solubility and complex-ion equilibria; thermodynamic; electrochemistry ; metals ; complex compounds;nuclear chemistry; organic chemistry and biochemistry
OBJECTIVES OF THE COURSE	The main aim of the course is about knowing fundamental aspects of chemistry.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Ability to apply the knowledge of physics and chemistry
LEARNING OUTCOMES OF THE COURSE	1. List factors that affect reaction rates. 2. Calculate a value for equilibrium constant and use it to predict the extent to which the reactions in a chemical reaction are converted to products.
MAIN TEXTBOOK	Jones, L. and Atkins, P. (2000). Chemistry, 4th Edition, W.H.Freeman and Company, New York, USA.
SUPPORTING REFERENCES	1.Petrucci, R., Harwood, W.S. and Herring, F.G. (2002). General Chemistry, 8th Edition, Prentice Hall, USA. 2.Ebbing, D.D., Wentworth, R.A.D. and Birk, J.P. (1995). Introductory Chemistry, Houghton Mifflin Company, USA.
NECESSARY COURSE MATERIALS	Computor and data show

COURSE SCHEDULE

WEEK	SUBJECTS
1	Chemical Kinetics
2	Principles Of Chemical Equilibrium
3	Acids And Bases
4	Acid-Base Equilibria
5	Midterm Exam 1
6	Solubility And Complex-Ion Equilibria
7	Thermodynamic
8	Electrochemistry
9	Metals
10	Midterm Exam 2
11	Complex Compounds
12	Nuclear Chemistry
13	Organic Chemistry
14	Biochemistry
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		x			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		x			
9	Ethical and professional responsibility.			x		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.					

ESOGU Physics Department Course Information Form

COURSE CODE: 121312199   **COURSE NAME:** Chemistry Lab.II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	0	2	1	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam			Midterm Exam	2	25
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM					1	50
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	
OBJECTIVES OF THE COURSE	The main aim of the course is to teach students how to carry out experimental work in the laboratory and gain ability to do chemical research related to the subjects taught in the main lecture
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Prepare every kind of solution required in the experiments,know the dangerous effects of chemicals used in the laboratory.
LEARNING OUTCOMES OF THE COURSE	Use techniques, skills, and modern tools necessary for practice in chemistry, gain ability on research and learn scientific method, gain ability on teamwork.
MAIN TEXTBOOK	Genel Kimya Laboratuar Uygulamaları (ESOGU)
SUPPORTING REFERENCES	1. Genel kimya Laboratuar Kitabı (2001) Cumhuriyet Üniversitesi Yayınları. 2. Petrucci R.H., Harwood W.S.,Herring F.G. (2005) Genel Kimya Palme Yayıncılık
NECESSARY COURSE MATERIALS	Laboratory eqiuments

COURSE SCHEDULE

WEEK	SUBJECTS
1	Pre-interwiev of laboratory
2	Introduction of laboratory equipments
3	The physical properties of matter
4	Qualitative analysis Destilation
5	Midterm Exam 1
6	Solution preparation
7	pH ve indicators
8	Titrimetric analysis
9	Acid-base titrations Crystal types of molecules
10	Midterm Exam 2
11	Melting, boiling and sublimation of matter
12	Determination of solubility of a substance
13	The effects of concentration and temperature on the reaction rate
14	Solution of matter in different solvents
15,16	Final exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.		x			
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		x			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	x				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.		x			
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.			x		

ESOGU Physics Department Course Information Form

COURSE CODE: 121312200   **COURSE NAME:** Analysis-II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	4	0	4	5	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
5	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Indefinite integrals and integration rules, Method of partial integration method, by changing the variable of integration, The special variable displacement, the integration of rational functions, Definite integral and applications (Area calculation, Arc length calculation, Volume calculation, Improper integrals), Sequence and series, Derivative and integral of Vector-valued functions, Vector-valued functions, arc-length and curvature, The differential calculus of multivariable functions, The integral calculus of multivariable functions, Area, Surface area and Volume calculation of multivariable integrals.
OBJECTIVES OF THE COURSE	The main of the course is to introduce the concepts and techniques involved in the basic topics listed in this lecture and to develop skills in applying those concepts and techniques to the solution of problems in Physics Lectures
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Gain the ability of problem solution.
LEARNING OUTCOMES OF THE COURSE	Gain sufficient knowledge of Analysis subject, related with science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of problems.
MAIN TEXTBOOK	Genel matematik-II, Prof Dr. Ali Görgülü
SUPPORTING REFERENCES	Analiz-II, Prof. Dr. Mahmut Koçak Analiz-II Prof Dr.Mustafa Balcı Genel matematik-I, Prof Dr. H:H:Hacısalihoğlu; Prof Dr.Mustafa Balcı
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Indefinite integrals and integration rules
2	Method of partial integration method, by changing the variable of integration
3	The special variable displacement, the integration of rational functions
4	Definite integral and applications (Area calculation, Arc length calculation, Volume calculation, Improper integrals)
5	Midterm Exam 1
6	Sequence and series
7	Problem solving
8	Derivative and integral of Vector-valued functions
9	Vector-valued functions, arc-length and curvature
10	Midterm Exam 2
11	The differential calculus of multivariable functions
12	The integral calculus of multivariable functions
13	Area, Surface area and Volume calculation of multivariable integrals
14	Problem solving,
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.			x		
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			x		
9	Ethical and professional responsibility.			x		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.					x

ESOGU Physics Department Course Information Form

COURSE CODE: 121312201

COURSE NAME: Occupational Health and Safety II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	2	0	2	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
5	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam			Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM						
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	
OBJECTIVES OF THE COURSE	
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	.
LEARNING OUTCOMES OF THE COURSE	
MAIN TEXTBOOK	
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.					
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.					
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.					
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.					
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.					
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.					
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.					
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.					
9	Ethical and professional responsibility.					
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.					
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.					
12	To have knowledge about the modern problems that are local and global.					

ESOGU Physics Department Course Information Form

COURSE CODE: 121312185   **COURSE NAME:** TURKISH LANGUAGE II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	Tutorial	Credit	ECTS	TYPE
2	2	-	0	2	Selective

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam	1	40	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	(WRİTTEN)					

PREREQUISIT(S) IF ANY	---
SHORT COURSE CONTENT	Punctuation and Composition (The spelling of capital letters, The writing of quotations. numbers, The Composition the purpose of composition, method in composition writing, planning, introduction, development and result in composition. Speech features. Expression disorders. Forms of expression The kinds of verbal telling .The kinds of written telling
OBJECTIVES OF THE COURSE	Development of Turkish and about the current state of Turkish. İnforming the students and show the richness of Turkish language. Giving awareness of language. Enable them to know and be able to use them in their daily lives of Turkish characteristics.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	This course provides to use Turkish in a good way for students in their daily-life. It is provides to students express themselves and their job in a good way.
LEARNING OUTCOMES OF THE COURSE	Comprehend the richness of the Turkish. Define the rules for Turkish language Knows phonetic Applies rules of writing Creates a composition Uses the Turkish right.
MAIN REFERENCES	1.Türk Dili ve Kompozisyon I-II, Gürer Gülsevin-Erdoğan Boz. 2. Üniversiteler için Türk Dili, Muharrem Ergin.
SUPPORTING REFERENCES	1. Kaplan, M., "Kültür ve Dil", 8. baskı, ,Dergah Yayınları, İstanbul, 1993. 2. Fuat, M., "Dil Üstüne", Adam Yayınları, İstanbul, 2001. 3. Ercilasun, A. B., "Başlangıçtan Yirminci Yüzyıla Türk Dili Tarihi", Akçağ Yayınları, 1. baskı, Ankara, 2004. 4. Aksan, D., "Türkçe'nin Gücü", Bilgi Yayınevi, 4. baskı, Ankara, 1997. 5. Karamanlıoğlu, A., "Türk Dili", Degah Yayınları, 3. baskı, İstanbul, 1984. 6. Anday, M. C., "Dilimiz Üstüne Konuşmalar", YKY, İstanbul, 1996. 7. Karaağaç, G., "Dil Tarih ve İnsan", Akçağ Yayınevi, Ankara, 2002. 8. Aksan, D., "Dil Şu Büyülü Düzen", Bilgi Yayınevi, Ankara, 2003. 9. Banarlı, N. S., "Türkçe'nin Sırları", 18. baskı, Kubbealtı Neşriyatı,

	İstanbul, 2002
NECESSARY COURSE MATERIALS	DVD, VCD, projection, computer

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Punctuation
2	Expression disorders
3	Expression disorders
4	Written Expression Data
5	Written Expression Data
6	Types of Written Expression
7	Mid-term exam
8	Types of Written Expression
9	Types of Written Expression
10	Varieties of expression
11	Types of Official Correspondence
12	Preparation Techniques of Scientific Articles
13	Verbal Expression
14	Effective Presentation Techniques
15,16	Final exam

ESOGU Physics Department Course Information Form

COURSE CODE: 121312186

COURSE NAME: English II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
2	3	0	0	3	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
	( )	√	

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Teaching of some structures for basic vocabulary and grammar knowledge
OBJECTIVES OF THE COURSE	Basis of English for A2 level
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	-
LEARNING OUTCOMES OF THE COURSE	Being aware of learning a language and being able to use some basic grammar structures
MAIN TEXTBOOK	Number One
SUPPORTING REFERENCES	Grammar Practice Elementary
NECESSARY COURSE MATERIALS	-

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Be going to/Travel and Tourism
2	Countable/uncountable nouns
3	Comparatives/superlatives
4	Present Perfect tense
5	Midterm Exam 1
6	Should/had better/must
7	General Review Questions
8	Grammar Practice modals
9	Grammar Practice prepositions
10	Midterm Exam 2
11	Grammar Practice sentence structures
12	Grammar Practice simple past/past continuous
13	Grammar Practice imperatives
14	General Review Questions
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.					x
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.					x
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.					x
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.					x
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.					x
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.				x	
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.				x	
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			x		
9	Ethical and professional responsibility.					x
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.					x
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.					x
12	To have knowledge about the modern problems that are local and global.				x	

ESOGU Physics Department Course Information Form

COURSE CODE: 121313311 **COURSE NAME:** Vibrations and Waves

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
3	4	0	4	6	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
3	( )	x	

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (.........)			Other (.........)		
FINAL EXAM			60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Periodic motions; Sinusoidal vibrations, simple harmonic motion, complex exponential description of vibrations, damped vibration motion, forced vibration motion and resonance, Superposition of periodic motions; Superposition of two or more waves with same or different frequency, beat, *Lissajous* figures, Free vibrations of physical systems; Mass-spring problem, simple pendulum, torsional pendulum, elasticity and Young modulus, floating objects, Coupled oscillators and normal modes; two or more coupled oscillators, normal frequencies, normal modes of crystal lattice, Normal modes of continuous systems; Free, damped and forced harmonic spring systems and superposition modes, Fourier analysis, Wave equation; standing and progressing waves, phase and group velocity, dispersion, Energy and momentum in wave propagation, 2 and 3 dimensional waves,
OBJECTIVES OF THE COURSE	The main aim of the course is to investigate the properties of vibration and wave motion that virtually all physical systems posses and detailed study of vibration and wave motion of some real physical systems.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Different point of view at natural phenomenon investigation, Detailed investigation of physical systems and analytical approach, Analyze and resolve natural phenomenon, Association of gained knowledge
LEARNING OUTCOMES OF THE COURSE	
MAIN TEXTBOOK	Gökhan Budak ve Yüksel Özdemir (2011) Titreşim ve Dalgalar
SUPPORTING REFERENCES	1. **French, A. P. (Çeviri: Nazım Uçar / 2004).** Titreşimler ve Dalgalar. İstanbul: Aktif Yayınevi 2. **Crawford F. S. (Çeviri: Rauf Nasuhoğlu / 1982).** Titreşimler ve Dalgalar (Berkeley Fizik Dizisi–3). Güven Yayıncılık. **French, A. P. (1971).** Vibrations and Waves. New York: W. W. Norton & CO

COURSE SCHEDULE

WEEK	SUBJECTS
1	Periodic motions; Sinusoidal vibrations,
2	Simple harmonic motion, complex exponential description of vibrations
3	Free vibrations of physical systems; Mass-spring problem, simple pendulum, torsional pendulum, elasticity and Young modulus, floating objects
4	Superposition of periodic motions; Superposition of two or more waves with same or different frequency, beat, *Lissajous* figures
5	Midterm Exam 1
6	Damped vibration motion
7	Forced vibration motion and resonance
8	Midterm Exam 2
9	Coupled oscillators and normal modes; two or more coupled oscillators, normal frequencies, normal modes of crystal lattice
10	Wave equation; standing waves
11	Progressing waves
12	Phase and group velocity, dispersion
13	Energy and momentum in wave propagation
14	2 and 3 dimensional waves
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			X		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.			X		
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of Physics.		X			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				X
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.			X		

ESOGU Physics Department Course Information Form

COURSE CODE: 121313312   **COURSE NAME:** Vibrations and Waves Laboratory

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
3	0	2	1	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam		40	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM			60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Simple pendulum, Spiral spring, *Lissajous* figures, Torsional pendulum, Underdamped harmonic motion, Critically damped harmonic motion, Underdamped forced harmonic motion, Speed measurement of sound wave propagation, Doppler shift, Standing waves.
OBJECTIVES OF THE COURSE	1. Different point of view at natural phenomenon investigation, 2. Detailed investigation of physical systems and analytical approach, 3. Analyze and resolve natural phenomenon, 4. Association of gained knowledge, 5. Functioning as a team member, Design and conduct experiments as well as to analyze and interpret data
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	
LEARNING OUTCOMES OF THE COURSE	
MAIN TEXTBOOK	1. Titreşim ve Dalgalar Laboratuarı Föyü. 2. **French, A. P. (Çeviri: Nazım Uçar / 2004).** Titreşimler ve Dalgalar. İstanbul: Aktif Yayınevi 3. **Crawford F. S. (Çeviri: Rauf Nasuhoğlu / 1982).** Titreşimler ve Dalgalar (Berkeley Fizik Dizisi–3). Güven Yayıncılık.
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Provide information about the experimental setups
2	Design and conduct experiments as well as to analyze and interpret data on samples experimental
3	Simple pendulum
4	Spiral spring
5	Midterm Exam 1
6	*Lissajous* figures
7	Torsional pendulum
8	Underdamped harmonic motion
9	Critically damped harmonic motion
10	Midterm Exam 2
11	Underdamped forced harmonic motion
12	Speed measurement of sound wave propagation
13	Doppler shift
14	Standing waves
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		x			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	x				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	x				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	x				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			x		
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.	x				
12	To have knowledge about the modern problems that are local and global.			x		

ESOGU Physics Department Course Information Form

COURSE CODE: 121313313   **COURSE NAME:** Mathematical Methods in Physics I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
3	**4**	**0**	**4**	**6**	COMPULSORY (**x**) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					
PREREQUISIT(S) IF ANY	Analysis I-II					
SHORT COURSE CONTENT	Complex Numbers; matrx and determinants; analytical geometry; vector analysis; gamma and beta functions.					
OBJECTIVES OF THE COURSE	To define the mathematics which is required to express, understand and formulate physics basic concepts.					
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To define and analyse natural sciences, relate and apply the knowledge in an interdisciplinary concept and follow contemporary professional subjects					
LEARNING OUTCOMES OF THE COURSE	apply knowledge of natural sciences (Mathematics, Physics, Chemistry)					
MAIN TEXTBOOK	**Boas, M. L. (1993).** Mathematical Methods in the Physical Sciences. New York: John Wiley&Sons.					
SUPPORTING REFERENCES	**1- Önem, C. (2003).** Mühendislik ve Fizikte Matematik Metodlar. İstanbul: Birsen Yay. **2- Karaoğlu, B. (1994).** Fizik ve Mühendislikte Matematik Yöntemler. İstanbul: Bilgi Tek Yay. **3- Özemre, A.Y. (1983).** Fizikte matematik metodlar. İstanbul: İstanbul Üniversitesi Fen Fakültesi Yayınları. **4- Kreyszig, E. (1994).** Advanced Engineering Mathematics.					
NECESSARY COURSE MATERIALS	**Face to face**					

COURSE SCHEDULE	
WEEK	SUBJECTS
1	Complex number; the complex plane, rectangular, exponential and polar forms of complex numbers, complex conjugate, elementary functions complex numbers, Euler's Formula
2	Powers and roots of complex numbers, exponential and trigonometric functions, hyperbolic functions, logarithms, complex powers, inverse trigonometric and hyperbolic functions
3	Properties of determinants; matrices, special matrices,; linear equations.
4	Eigenvalues and eigenvectors
5	Midterm Exam 1
6	Vectors; vector operations; index notation; triple products
7	Analitical geometry; dots; lines and planes
8	Differrentiation of vectors; scalar and vectors fields; directional derivative; gradient and applications
9	Diverjgence; rotational (curl); laplacian and applications
10	Midterm Exam 2
11	Line integrals; conservative fields; scalar potential; exact differentials
12	Green theorem in the plane; Divergence theorem; Gauss's law
13	Rotational and applications; Stokes' theorem; Ampere 's law
14	Factorial function; gamma function and recursion relation; Beta function–error function.
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)						
NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	X				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		X			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.			X		
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.			X		
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		X			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	X				
9	Ethical and professional responsibility.		X			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.			X		

SEMESTER	Fall

COURSE CODE	121313314	COURSE NAME	Differential Equations I

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	Practice	Labratory	Credit	ECTS	TYPE	LANGUAGE
3	3	0	0	3	4	COMPULSORY (x) ELECTIVE ( )	Turkish

COURSE CATAGORY		
Mathematics	**Computer**	**Social Science**
	X	

ASSESSMENT CRITERIA			
	Evaluation Type	Quantity	%
MID-TERM	1st Mid-Term		
	2nd Mid-Term		
	Quiz		
	Homework	1	40
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	60

PREREQUIEITE(S)	
COURSE DESCRIPTION	First Order Differential Equations and Applications, Higher Order LinearDifferential Equations
COURSE OBJECTIVES	The main objective of this course, students gain skills necessary to solve thedifferential equations
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	Enhance the horizons of Mathematics
COURSE OUTCOMES	1-Using the science of physical infrastructure of the differential equation. 2- Analysis to explain natural phenomena. 3- **To define** related problems, formulate and solve. 4- Understanding of scientific methods and research skills. 5. Information interdisciplinary association and application. 6. Understand professional and ethical responsibility. 7. Understand the importance of lifelong learning and practice. 8. Courses with a relevant professional qualification and knowledge of contemporary issues of ownership.
TEXTBOOK	Özer, N. ve, Eser, D. "Diferensiyel Denklemler", Eskişehir 2002.
OTHER REFERENCES	Zill, D. G., Differential equations with boundary-value problems. USA: PWS, 1986.
TOOLS AND EQUIPMENTS REQUIRED	

	COURSE SYLLABUS			
WEEK	**TOPICS**			
1	Differential Equations and their solutions			
2	Differential Equations and their solutions (continue)			
3	Differential Equations and their solutions (continue)			
4	Differential Equations and their solutions (continue)			
5	Midterm exam 1			
6	The first order differential equations and their applications			
7	The first order differential equations and their applications (continue)			
8	The first order differential equations and their applications (continue)			
9	Higher order linear differential equations			
10	Midterm exam 2			
11	Higher order linear differential equations (continue)			
12	Higher order linear differential equations (continue)			
13	Higher order linear differential equations (continue)			
14	Higher order linear differential equations (continue)			
15,16	Final			

NO	PROGRAM OUTCOMES	3	2	1
1	The ability to apply knowledges of Mathematics and Computer Sciences,	X		
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	X		
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	X		
4	The skill to solve and design a problem process in accordance with a defined target,	X		
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	X		
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	X		
7	The skill to make team work within the discipline and interdisciplinary,		X	
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,		X	
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,		X	
10	The skill to have professional and ethical responsibility,		X	
11	The skill to have consciousness for quality issues and scientific research,		X	
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,		X	
13	Ability to solve problems in the working life faced to find an appropriate algoritms via mathematical modeling and to write computer programs,	X		
14	The skill to developed design of software systems at different complex levels,	X		
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.		X	
1:None. **2**:Partially contribution. **3**: Completely contribution.				

ESOGU Physics Department Course Information Form

COURSE CODE: 121313315   **COURSE NAME:** Computer Programming

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
3	2	2	3	5	ZORUNLU (x) SEÇMELİ ( )

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
3	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	1	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework	1	25	Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					
PREREQUISIT(S) IF ANY	-					

SHORT COURSE CONTENT	History of computer; operating systems; programming languages; Algorithms and flow charts; FORTRAN programming language; FORTRAN constants and variables; Arithmetic operations, Input/Output statements; Format and description statements; GOTO statements with or without conditional; Arithmetic IF statement, logical IF statement; DO, STOP, PAUSE and END statements; one diemensional sequences; DIMENSION statement and its examples; Matrices, READ/WRITE operations in variables with indices; DATA statement; statement functions; FUNCTION subprogramme; SUBROUTINE subprogramme; EQUIVALENCE and COMMON statements; BLOCK DATA subprogramme; writing a programme in FORTRAN programming language; make run, link, and compile of FORTRAN 90 programme under Windows operating system; various applications in physics
OBJECTIVES OF THE COURSE	The main aim of the course is to introduce knowledge about basic FORTRAN programming and make applications by FORTRAN programming language in physical problems
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Computer applications to simulate the physical environment, using computer programs to perform the solution of physical problems, the student will give a different perspective.
LEARNING OUTCOMES OF THE COURSE	Realize FORTRAN programming and its compile. Apply knowledge of natural sciences (Mathematics, Physics, Chemistry). Identify, formulate, and solve field related problems. Design and conduct experiments as well as to analyze and interpret data. Use new technology and modern techniques such as computer and computer software to analyze and model the scientific problems. Direct correlation and application of gained knowledge with technology and industry. Interdisciplinary knowledge association and application. Gain a knowledge of contemporary issues
MAIN TEXTBOOK	**Altaç, Z. & Gürkan, İ. (1995).** Mühendisler için Fortran Proglamlama. Eskişehir: ESOGÜ Yayınları
SUPPORTING REFERENCES	1. **Bekir Karaoğlu (2004).** Sayısal Fizik. İstanbul: Seyir Yayıncılık. 2. **Pres, W. H., Flannery, B. P., Teukolsky, S. A., Vetterling, W. T. (1992)**. Numerical Recipes in FORTRAN. New York: Cambridge Press. 3. **DeVries P. L. (1994).** A First Course in Computational Physics. New York: John Wiley & Sons Inc.

COURSE SCHEDULE

WEEK	SUBJECTS

1	History of computer; operating systems; programming languages
2	Algorithms and flow charts; FORTRAN programming language
3	FORTRAN constants and variables; Arithmetic operations
4	Input/Output statements; Format and description statements; GOTO statements with or without conditional
5	Midterm Exam 1
6	Arithmetic IF statement, logical IF statement
7	DO, STOP, PAUSE and END statements; one diemensional sequences; DIMENSION statement
8	Matrices, READ/WRITE operations in variables with indices; DATA statement
9	Statement functions; FUNCTION subprogramme; SUBROUTINE subprogramme
10	Midterm Exam 2
11	EQUIVALENCE and COMMON statements; BLOCK DATA subprogramme
12	Writing a programme in FORTRAN programming language; make run, link, and compile of FORTRAN 90 programme under Windows operating system
13	Various applications in physics
14	Various applications in physics
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES						
NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.			x		
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.			x		
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.		x			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.			x		

ESOGU Physics Department Course Information Form

COURSE CODE	121313298	COURSE NAME	History of Turkish Revolution and Principles of Kemal Atatürk: I

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	**Practice**	**Laboratory**	**Credit**	**ECTS**	**TYPE**	**LANGUAGE**
	2	0	0	2	2	COMPULSORY (x) ELECTIVE ( )	Turkish

COURSE CATAGORY			
General Literature	**Foreign Languages**	**Comparative Literature**	**Social Science**
			X

ASSESSMENT CRITERIA

	Evaluation Type	Quantity	%
MID-TERM	1st Mid-Term		
	2nd Mid-Term	1	40
	Quiz		
	Homework		
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	60

PREREQUIEITE(S)	None
COURSE DESCRIPTION	The Description of the term "revolution"; major historical events in the Ottoman Empire to the end of World War I; a general overview of Mustafa Kemal's life; certain associations and their activities; arrival of Mustafa Kemal to Samsun; the congresses, gathering of the last Ottoman Assembly and the proclamation of the "national oath"; opening of the Turkish Grand National Assembly; War of independence to the Victory of Sakarya; Victory of Sakarya; financial sources of the war of independence; grand counter-attack; Armistice of Mudanya; abolution of the Sultanate; Peace Conference of Lausanne.
COURSE OBJECTIVES	To help the students to appreciate the hard conditions under which the war of independence, under the leadership of Mustafa Kemal, was fought and how an independent Turkish state was created.
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	To underline the idea that the national unity based on the principle "peace in the country peace in the world" can only be achieved through political, economic and military progress.
COURSE OUTCOMES	At the end of this course; Students 1.Explains Principles of Atatürk and main concepts related to Revolution history. 1.1.Explians the concepts of Reform/Revolution. 1.2.Describes the concept of National Forces. 1.3.Explains the concepts of Republic/Democracy. 1.4.Recognizes the concept of Ideology. 2.Explains the main points of the period related to Turkish War of Independence and foundation of the Turkish State. 2.1.Explains the developments at Ottoman Empire before Turkish Revolution. 2.2.Describes the World War I and its results. 2.3.Explains Turkish War of Independence. 2.4.Recognizes Turkish Revolution.

	2.5.Remembers the mian principles of Turkish foreign politics. 2.6.Explains Principles of Atatürk and their importance. 3.Explains the effects of the developments at Europe and World on Turkish Republic. 3.1.Explains the effects of European and World politics on Turkey and the results of them. 3.2.Describes the effects of Capitalism/Emperialism on Turkey. 3.3.Explains the relations / problems between Turkey and its neighbours. 3.4.Explains the importance of Turkey at Europe and World.
TEXTBOOK	Gazi Mustafa Kemal Atatürk, Nutuk (Söylev), C. I-II, TTK., Ank., 1986. İmparatorluktan Ulus Devlete Türk İnkılâp Tarihi, Cemil Öztürk (ed.), Ank., 2011.
OTHER REFERENCES	* Ateş,Toktamış.(2001)Türk Devrim Tarihi.İstanbul:Der Yayınları. * Aybars,Ergün.(200)Türkiye Cumhuriyeti Tarihi.İzmir:Ercan Kitabevi. * Eroğlu,Hamza.(1990)Türk İnkılasp Tarihi.Ankara:Savaş Yayınları. * Kongar,Emre.(1999)Devrim Tarihi ve Toplumbilim Açısından Atatürk.İstanbul.Remzi Kitabevi. * Selek,sebahattin.(1987)Anadolu İhtilali.İstanbul:Kastaç A.Ş.Yayınları. * Şamsutdinov,A.M.(1999)Mondros'tan Lozan'aTürkiye Ulusal Kurtuluş Savaşı Tarihi (1918-1923)Çeviren:Ataol Behramoğlu.İstanbul:Doğan Kitapçılık. * Timur,Taner.(1997)Türk Devrimi ve Sonrası.Ankara:İmge Kitabevi.
TOOLS AND EQUIPMENTS REQUIRED	

COURSE SYLLABUS	
WEEK	**TOPICS**
1	The Balkan Wars. First World War and input to war Ottoman Empire. The fronts that Ottoman Empire fighted and the results of the war.
2	Revolution, evolution, rebellion, coup and reform. The characteristics of the Turkish Revolution. the reasons of collapse of the Ottoman Empire.
3	Mondros Armistice Agreeement and occupations on the Ottoman Empire.
4	National Independence War. The occupation of Izmir and effects of this occupation.
5	The preparation period of National Independence War
6	Mid-Term Examination 1
7	The movement of Mustafa Kemal to Samsun and to be started the organization of Anadolu Revolution. Amasya Circular, Erzurum and Sivas Congresses, to be founded of the Deputation.
8	Opening of the TBMM.
9	Rebellions against the TBMM.
10	Sevr Treaty.
11	Mid-Term Examination 2
12	To be founded "Kuva-yı Milliye" and national army.
13	Mudanya Armistice Agreement. Abolution of sultanate.
14	Lausanne Treaty.
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and … engineering; an ability to apply theoretical and practical knowledge on solving and modeling of … engineering problems.			X
2	Ability to determine, define, formulate and solve complex … engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			X
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods.			X
4	Ability to develop, select and use modern methods and tools required for … engineering applications; ability to effective use of information technologies.			X
5	In order to investigate … engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.			X
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.		X	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.		X	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	X		
9	Understanding of professional and ethical issues and taking responsibility		X	
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.			X
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			X
1:None. **2**:Partially contribution. **3**: Completely contribution.				

ESOGU Physics Department Course Information Form

COURSE CODE: 121314310   **COURSE NAME:** MODERN PHYSICS

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
4	3	0	3	5	COMPULSORY (x) ELECTIVE ()

Please depict the credit (for non-credit courses, number of course hours per week) of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
3	(x)		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	25	Midterm Exam	-	-
	Quiz	-	-	Experimenting Performance	-	-
	Homework	-	-	Reporting	-	-
	Project	-	-	Oral Exam or Quiz	-	-
	Other (Internship)	-	-	Other (………)	-	-
FINAL EXAM		1	50		-	-
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Special theory of relativity, Galilean and Lorentz transformations, relativistic mechanics, atomic structure of matter, quantization of light, blackbody radiation, photoelectric effect, waves and particles, de Broglie's hypothesis, the uncertainty principle, wave mechanics, and the Bragg diffraction of X-Rays, Compton Effect, Bohr-Sommerfeld atomic theory, Bohr's theory and compare the results of wave mechanics, quantum theory of hydrogen atom, the atom vector model and the electron system, molecular structure, molecular spectra, nuclear structure and radioactivity.
OBJECTIVES OF THE COURSE	The main objective of this course, basic principles and concepts of modern physics is to learn.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To work to better understand the nature of some aspects of physical development which is implemented by transferring students to the basic theories.
LEARNING OUTCOMES OF THE COURSE	Learning about the basic principles and concepts of modern physics Mathematics is the ability to apply knowledge of basic sciences such as physics and chemistry. Ability to analyze and explain natural phenomena. Problems concerning the structure of the substance to identify, formulate, and solve. Interpret the most basic concepts in detail. Interdisciplinary knowledge and application skills relate. Vocational skills of contemporary issues.
MAIN TEXTBOOK	**Beiser, A. (1969)**. Perspectives of Modern Physics. McGraw-Hill.
SUPPORTING REFERENCES	1. **Gündüz, E. (1999)**. Modern Fiziğe Giriş. İzmir: Ege Üniv. Fen Fak. Kitaplar Serisi No:110. 2. **Taylor, J.R., Zafaritos, C. (1996)**. Modern Fizik. İstanbul: Arte Güven. 3. **Eisberg, R., Resnick, R. (1974)**. Quantum physics of atoms, molecules, solids, nuclei and particles. New York: John Wiley & Sons. 4. **Aygün, E., Zengin D.M. (1990)**. Kuantum Fiziği. Ankara: Bilim yayınevi.
NECESSARY COURSE MATERIALS	-

COURSE SCHEDULE

WEEK	SUBJECTS
1	Basic principles and concepts of modern physics
2	Special theory of relativity, Galilean and Lorentz transformations
3	Relativistic mechanics, atomic structure of matter
4	Quantization of Light
5	Midterm Exam 1
6	Black body radiation, photoelectric effect,
7	Waves and particles, de Broglie's hypothesis, the uncertainty principle
8	Wave mechanics, and the Bragg diffraction of X-Rays, Compton Effect
9	Bohr-Sommerfeld atomic theory, Bohr's theory of wave mechanics and compare the results
10	Midterm Exam 2
11	Quantum theory of hydrogen atom
12	Vector model of the atom and the electron system,
13	The molecular structure of molecular spectra
14	Nuclear structure and radioactivity.
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.		X			
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.	X				
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	X				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.	X				
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	X				
9	Ethical and professional responsibility.	X				
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.	X				
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.	X				
12	To have knowledge about the modern problems that are local and global.		X			

ESOGU Physics Department Course Information Form

COURSE CODE: 121314311   **COURSE NAME:**   MODERN PHYSICS LABORATORY

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
4	0	2	1	2	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**		**General Education**	**Social**
1	( )			

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam			Midterm Exam	2	25
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM					1	50
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Experiments in the laboratory study and Safety, In Laboratory Vehicles and Equipments, Photoelectric Effect, Photovoltaic Effect, Geissler Tubes, Grup Determine, e/ m Determination, Electrons in Electric and Magnetic Field Preparation and Presentation Graphics, Hall Experiment
OBJECTIVES OF THE COURSE	Photoelectric, photovoltaics, low-pressure gas discharge, deflection of electrons by electric and magnetic making the to teach
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Experiments are designed to teach laboratory and experimental work.
LEARNING OUTCOMES OF THE COURSE	Apply knowledge of natural sciences (Mathematics, Physics, Chemistry) Identify, formulate, and solve field related problems Design and conduct experiments as well as to analyze and interpret data Interdisciplinary knowledge association and application Direct correlation and application of gained knowledge with technology and industry Get a recognition of the need for, and an ability to engage in life-long learning Gain a knowledge of contemporary issues
MAIN TEXTBOOK	
SUPPORTING REFERENCES	**REFERENCES** **TAYLOR, John J., ZAFIRATOS, Chris D., DUBSON, Michael A.**;(2004) Modern Physics. **KRANE, Kenneth;** (1982) Modern Physics. John Wiley and Sons **SERWAY, Raymond A. ;**(1990) Physics. For Scientists and Engineers
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Experiments in Laboratory Study and Safety,
2	In Laboratory tools and equipments,
3	In Laboratory toola and equipments,
4	Photoelectric Effect,
5	Midterm Exam 1
6	Photovoltaic Effect,
7	Geissler Tüpleri
8	e/ m Determination, Field Preparation and Presentation Graphics, ,
9	Electrons in Electric and Magnetic
10	Midterm Exam 2
11	Hall Experiment Elektron Kırınımı Deneyi
12	Electron Diffraction Experiment
13	Report Preparation and Presentation
14	Graphics Rendering
15,16	**Final Exam**

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.			X		
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.	X				
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	X				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		X			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.		X			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.		X			

ESOGU Physics Department Course Information Form

COURSE CODE: 121314312   **COURSE NAME:** MATHEMATICAL METHODES IN PHYSICS II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
4	4	0	4	6	ZORUNLU (**x**) SEÇMELİ ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	**2**	**25**	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		**1**	**50**			
MAKE UP EXAM (Oral/Written)	Written					
PREREQUISIT(S) IF ANY	Analysis I-II, Dif. Eq. I					
SHORT COURSE CONTENT	Fourier series; linear tranformations; curvilinear coordinates; calculus of variations; complex variable functions;integral tranforms.					
OBJECTIVES OF THE COURSE	To define the mathematics which is required to express, understand and formulate physics basic concepts.					
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To define and analyse natural sciences, relate and apply the knowledge in an interdisciplinary concept and follow contemporary professional subjects					
LEARNING OUTCOMES OF THE COURSE	apply knowledge of natural sciences (Mathematics, Physics, Chemistry)					
MAIN TEXTBOOK	**Boas, M. L. (1993).** Mathematical Methods in the Physical Sciences. New York: John Wiley&Sons.					
SUPPORTING REFERENCES	**1- Önem, C. (2003).** Mühendislik ve Fizikte Matematik Metodlar. İstanbul: Birsen Yay. **2- Karaoğlu, B. (1994).** Fizik ve Mühendislikte Matematik Yöntemler. İstanbul: Bilgi Tek Yay. **3- Özemre, A.Y. (1983).** Fizikte matematik metodlar. İstanbul: İstanbul Üniversitesi Fen Fakültesi Yayınları. **4- Kreyszig, E. (1994).** Advanced Engineering Mathematics.					
NECESSARY COURSE MATERIALS	Face to face					

COURSE SCHEDULE

WEEK	SUBJECTS
1	Fourier series; average value of a function; Fourier coefficient
2	Drichlet condition; even and odd functions; Parseval theorem
3	İntegral and differantial of Fourier series; Linear transformations; orthogonal tranformations
4	Digonalizing matrices; applications of diagonalization
5	Midterm Exam
6	Curvilinear coordinates;scale factors and basis vectors for orthogonal systems
7	Vector operators in orthogonal curvilinear coordinates
8	Calculus of variations;Eular equation and applications
9	Several dependent variables; Lagrange' equations; Isoperimetric problems; Variational notation
10	Midterm Exam
11	Complex variable functions; Analytic functions, Contour integrals
12	Laurent series; Residue theorem; Methods of finding residues
13	Integral tranforms; Laplace tranform
14	Fourier tranform
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.			x		
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.			x		
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.			x		

ESOGÜ Physics Department COURSE INFORMATION FORM

COURSE CODE	121314313	COURSE NAME	Differential Equations II

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	**Practice**	**Labratory**	**Credit**	**ECTS**	**TYPE**	**LANGUAGE**
4	3	0	0	3	4	COMPULSORY (x) ELECTIVE ( )	Turkish

COURSE CATAGORY		
Mathematics	**Computer**	**Social Science**
	X	

ASSESSMENT CRITERIA			
	Evaluation Type	Quantity	%
MID-TERM	1st Mid-Term		
	2nd Mid-Term		
	Quiz		
	Homework	1	40
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	60

PREREQUIEITE(S)	
COURSE DESCRIPTION	Applications of second order linear differential equations with constant coefficients;serial solutions of linear differential equations, linear differential equation systems.
COURSE OBJECTIVES	The main objective of this course, students gain skills necessary to solve thedifferential equations
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	Enhance the horizons of Mathematics
COURSE OUTCOMES	1-Using the science of physical infrastructure of the differential equation. 2- Analysis to explain natural phenomena. 3- **To define** related problems, formulate and solve. 4- Understanding of scientific methods and research skills. 5. Information interdisciplinary association and application. 6. Understand professional and ethical responsibility. 7. Understand the importance of lifelong learning and practice. 8. Courses with a relevant professional qualification and knowledge of contemporary issues of ownership.
TEXTBOOK	Özer, N. ve, Eser, D. "Diferensiyel Denklemler", Eskişehir 2002.
OTHER REFERENCES	Zill, D. G., Differential equations with boundary-value problems. USA: PWS, 1986.
TOOLS AND EQUIPMENTS REQUIRED	

COURSE SYLLABUS

WEEK	TOPICS
1	Applications of second order linear differential equations with constant coefficients
2	Applications of second order linear differential equations with constant coefficients (continue)
3	Applications of second order linear differential equations with constant coefficients (continue)
4	Applications of second order linear differential equations with constant coefficients (continue)
5	Midterm exam 1
6	serial solutions of linear differential equations
7	Solutions of differential equations using Laplace transformation
8	Solutions of differential equations using Laplace transformation (continue)
9	Solutions of differential equations using Laplace transformation (continue)
10	Midterm exam 2
11	Solutions of systems of differential equations
12	Solutions of systems of differential equations (continue)
13	Solutions of systems of differential equations (continue)
14	Solutions of systems of differential equations (continue)
15,16	Final

NO	PROGRAM OUTCOMES	3	2	1
1	The ability to apply knowledges of Mathematics and Computer Sciences,	X		
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	X		
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	X		
4	The skill to solve and design a problem process in accordance with a defined target,	X		
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	X		
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	X		
7	The skill to make team work within the discipline and interdisciplinary,		X	
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,		X	
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,		X	
10	The skill to have professional and ethical responsibility,		X	
11	The skill to have consciousness for quality issues and scientific research,		X	
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,		X	
13	Ability to solve problems in the working life faced to find an appropriate algoritms via mathematical modeling and to write computer programs,	X		
14	The skill to developed design of software systems at different complex levels,	X		
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.		X	
1:None. **2**:Partially contribution. **3**: Completely contribution.				

ESOGU Physics Department Course Information Form

COURSE CODE: 121314314   **COURSE NAME:** Introduction to Electronics

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
4	3	0	3	4	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
3	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM			50			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Current, voltage and resistance, Kirchooff's current and voltage theorems, Superposition theorem, Thevenin Theorem, Norton theorem, Capacitors, Inductors, Alternative Current Circuits, Empedance and Phasor, current-voltage diagrams, RC and RL fitler circuits
OBJECTIVES OF THE COURSE	The main aim of the course is to introduce the electric circuit elemans, to realize the role in technology and to teach dc and ac circuit analyses techniques.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To have information on direct current circuits and circuit elements, to be able to apply DC and AC Circuit Solution methods.
LEARNING OUTCOMES OF THE COURSE	1. Apply knowledge of natural sciences (Mathematics, Physics, Chemistry) 2. Identify, formulate, and solve field related problems 3. Design and conduct experiments as well as to analyze and interpret data 4. Interdisciplinary knowledge association and application 5. Direct correlation and application of gained knowledge with technology and industry 6. Get a recognition of the need for, and an ability to engage in life-long learning 7. Gain a knowledge of contemporary issues
MAIN TEXTBOOK	**1.Uğur Arifoğlu,** DC Devreler **2.Uğur Arifoğlu,** AC Devreler
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Current, voltage and resistance, Kirchooff's current and voltage theorems, Superposition theorem, Thevenin Theorem, Norton theorem, Capacitors, Inductors, Alternative Current Circuits, Empedance and Phasor, current-voltage diagrams, RC Circuits, RL circuits, RLC circuits, Resonant Circuits
2	Current, voltage and resistance
3	Kirchooff's current and voltage theorems
4	Superposition theorem
5	Midterm Exam 1
6	Thevenin Theorem, Norton theorem
7	Capacitors
8	Inductors
9	Alternative Current Circuits
10	Midterm Exam 2
11	Alternative Current Circuits
12	Empedance and Phasor
13	Current-voltage diagrams
14	RC and RL filter circuits,
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.		X			
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.		X			
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.					X
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.				X	
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.				X	
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.				X	
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.				X	
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				X	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.				X	
12	To have knowledge about the modern problems that are local and global.			X		

ESOGU Physics Department Course Information Form

COURSE CODE: 121314315   **COURSE NAME:** Introduction to Electronics Lab.

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
4	0	2	1	2	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).			
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
1	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam			Midterm Exam	2	25
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM					1	50
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Resistance, Current and voltage in Combined circuits, Thevenin theorem, Capacitors, RC Circuits, Inductors, Phase shift Circuits, Empedance, Resonant circuits
OBJECTIVES OF THE COURSE	Fundamental objective of the course is to introduce electrical circuit elements, importence of them in technology and to teach DC/AC Circuit analysis methods.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	To learn basic circuit elements, to be able to set-up electric circuits, to be able to operate electric circuit equipments
LEARNING OUTCOMES OF THE COURSE	1. Apply knowledge of natural sciences (Mathematics, Physics, Chemistry) 2. Identify, formulate, and solve field related problems 3. Design and conduct experiments as well as to analyze and interpret data 4. Interdisciplinary knowledge association and application 5. Direct correlation and application of gained knowledge with technology and industry 6. Get a recognition of the need for, and an ability to engage in life-long learning 7. Gain a knowledge of contemporary issues
MAIN TEXTBOOK	Electric Circuit Analysis Laboratory Manual
SUPPORTING REFERENCES	**1.Uğur Arifoğlu,** DC Devreler **2.Uğur Arifoğlu,** AC Devreler
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Resistance, Current and voltage in Combined circuits
2	Resistance, Current and voltage in Combined circuits
3	Resistance, Current and voltage in Combined circuits
4	Thevenin theorem
5	Midterm Exam 1
6	Capacitors
7	RC Circuits
8	Inductors
9	Phase shift Circuits
10	Midterm Exam 2
11	Phase shift Circuits
12	Empedance
13	Resonant circuits
14	Resonant circuits
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.			X		
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.			X		
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.	X				
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	X				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	X				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		X			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.		X			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			X		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.		X			

ESOGU Physics Department Course Information Form

COURSE CODE	121314298	COURSE NAME	History of Turkish Revolution and Principles of Kemal Atatürk: II

SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	**Practice**	**Laboratory**	**Credit**	**ECTS**	**TYPE**	**LANGUAGE**
	2	0	0	2	2	COMPULSORY (x) ELECTIVE ( )	Turkish

COURSE CATAGORY			
General Literature	**Foreign Languages**	**Comparative Literature**	**Social Science**
			X

ASSESSMENT CRITERIA			
	Evaluation Type	**Quantity**	**%**
MID-TERM	1st Mid-Term		
	2nd Mid-Term	1	40
	Quiz		
	Homework		
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	60

PREREQUIEITE(S)	None
COURSE DESCRIPTION	The Description of the term "revolution"; major historical events in the Ottoman Empire to the end of World War I; a general overview of Mustafa Kemal's life; certain associations and their activities; arrival of Mustafa Kemal to Samsun; the congresses, gathering of the last Ottoman Assembly and the proclamation of the "national oath"; opening of the Turkish Grand National Assembly; War of independence to the Victory of Sakarya; Victory of Sakarya; financial sources of the war of independence; grand counter-attack; Armistice of Mudanya; abolution of the Sultanate; Peace Conference of Lausanne.
COURSE OBJECTIVES	To help the students to appreciate the hard conditions under which the war of independence, under the leadership of Mustafa Kemal, was fought and how an independent Turkish state was created.
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	To underline the idea that the national unity based on the principle "peace in the country peace in the world" can only be achieved through political, economic and military progress.
COURSE OUTCOMES	At the end of this course; Students 1.Explains Principles of Atatürk and main concepts related to Revolution history. 1.1.Explians the concepts of Reform/Revolution. 1.2.Describes the concept of National Forces. 1.3.Explains the concepts of Republic/Democracy. 1.4.Recognizes the concept of Ideology. 2.Explains the main points of the period related to Turkish War of Independence and foundation of the Turkish State. 2.1.Explains the developments at Ottoman Empire before Turkish Revolution. 2.2.Describes the World War I and its results. 2.3.Explains Turkish War of Independence. 2.4.Recognizes Turkish Revolution.

	2.5.Remembers the mian principles of Turkish foreign politics. 2.6.Explains Principles of Atatürk and their importance. 3.Explains the effects of the developments at Europe and World on Turkish Republic. 3.1.Explains the effects of European and World politics on Turkey and the results of them. 3.2.Describes the effects of Capitalism/Emperialism on Turkey. 3.3.Explains the relations / problems between Turkey and its neighbours. 3.4.Explains the importance of Turkey at Europe and World.
TEXTBOOK	Gazi Mustafa Kemal Atatürk, Nutuk (Söylev), C. I-II, TTK., Ank., 1986. İmparatorluktan Ulus Devlete Türk İnkılâp Tarihi, Cemil Öztürk (ed.), Ank., 2011.
OTHER REFERENCES	Niyazi Berkes, Türkiye'de Çağdaşlaşma, İstanbul, 1978. Enver Ziya Karal, Atatürk ve Devrim (Konferanslar ve Makaleler), TTK., Ank., 1980. Enver Ziya Karal, Atatürk'ten Düşünceler, MEB. Yay., Ankara, 1981. Bernard Lewis, Modern Türkiye'nin Doğuşu, Çev.M.Kıratlı, TTK., Ank., 1970. Ahmet Mumcu, Tarih Açısından Türk Devriminin Temelleri ve Gelişimi, Ank., 1976.
TOOLS AND EQUIPMENTS REQUIRED	

COURSE SYLLABUS	
WEEK	**TOPICS**
1	Mudanya Armistice Agreement.
2	Abolution of sultanate. Lausanne Treaty.
3	Declaration of Republic
4	Abolution of caliphate and lodges
5	Constitutional developments in Turkey. Internal and external political developments in the period of Atatürk's and Inönü's.
6	Mid-Term Examination 1
7	The political currents that effected Turkish revolution. Democratic law state.
8	The political currents that effected Turkish revolution. Democratic law state
9	Establishment of the Turkish law and educational system
10	Revolution movements in education, culture and health,
11	Mid-Term Examination 2
12	Nationalism, Etatism and Populism.
13	Securalism, Revoluationism
14	General ecalutation.
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and … engineering; an ability to apply theoretical and practical knowledge on solving and modeling of … engineering problems.			X
2	Ability to determine, define, formulate and solve complex … engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			X
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods.			X
4	Ability to develop, select and use modern methods and tools required for … engineering applications; ability to effective use of information technologies.			X
5	In order to investigate … engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.			X
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.		X	
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least		X	

	one foreign language.			
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	X		
9	Understanding of professional and ethical issues and taking responsibility		X	
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.			X
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			X
1:None. **2**:Partially contribution. **3**: Completely contribution.				

COURSE CODE: 121315413   **COURSE NAME:** QUANTUM PHYSICS I

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
5	4	0	4	7	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

SHORT COURSE CONTENT	Historical view to classical physics' insufficiencies, matter and wave, operators and their types, the postulates of quantum mechanics, the Schrödinger equation and its applications, bound and unbound states, potential barrier, finite potential well, some applications with two and three degrees of freedom, the general formalism of quantum mechanics.
OBJECTIVES OF THE COURSE	To introduce the principles and the general formalism of quantum mechanics, and to make their applications.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Students will learn classical physics' insufficiencies in investigation of natural phenomena. Meanwhile, students will do solutions for these phenomena by means of the quantum mechanical point of view. Applying the quantum mechanical equations of motion to the constitutes of micro universe, students will understand its importance in daily life applications such as electronics, semiconductor technology.
LEARNING OUTCOMES OF THE COURSE	1. Understand the fundamental principles and concepts of quantum physics. 2. Understand natural phenomena by the quantum mechanical point of view. 3. Apply knowledge of natural sciences (Physics, Chemistry, Mathematics). 4. Justify and analyze natural phenomena. 5. Identify, formulate, and solve field related problems. 6. Interdisciplinary knowledge association and application. 7. Direct correlation and application of gained knowledge with technology and industry. 8. Get an understanding of professional and ethical responsibility. 9. Get a recognition of the need for, and an ability to engage in life-long learning. 10. Gain a knowledge of contemporary issues.
MAIN TEXTBOOK	Karaoğlu, B., "Kuantum mekaniğine giriş", Seçkin Yayıncılık, Ankara, 2008.
SUPPORTING REFERENCES	1. Griffiths, D. J., Translation: Özbek, H., Feyiz, S. D., "Kuantum Mekaniğine Giriş", Nobel Yayınları, Ankara, 2010. 2. Gasiorowicz, S., "Quantum physics (3rd edition)", John Wiley & Sons, New Jersey, 2003. 3. Aygün, E., Zengin D. M., "Kuantum Fiziği", Bilim Yayınları, Ankara, 1992. 4. Erbil, H., "Kuantum Fiziği-I", Ege Üniversitesi Yayınları, İzmir, 2001.

5. Budak, G., Karabulut A., "Kuantum Fiziği I", Nobel Yayınları, Ankara, 2007. 6. Liboff, R. L., "Kuantum mekaniğine giriş", Addison-Wesley, New York, 1988. 7. Landau, L.D., Lifshitz, E. M., Çeviri: Zengin, M. Selam, C. Korcak, S., "Kuantum Mekaniği", Bilim Yayınları, Ankara, 2000. 8. Zettili, N., "Quantum mechanics", John Wiley &Sons, New York, 2001.

COURSE SCHEDULE

WEEK	SUBJECTS
1	Historical view to classical physics' insufficiencies
2	Matter and wave
3	Operators, expected values
4	The Schrödinger equation
5	Midterm Exam 1
6	Free-particle solution
7	The time-independent Schrodinger equation and its applications
8	Potential barrier, tunneling effect
9	Finite potential well and its examples
10	Midterm Exam 2
11	Harmonic oscillator
12	Space of wave functions
13	Superposition principle
14	Some special operators
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.				x	
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	x				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				
9	Ethical and professional responsibility.	x				
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.	x				

ESOGU Physics Department Course Information Form

COURSE CODE: 121315414   **COURSE NAME:** CLASSICAL MECHANIC

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
5	4	0	4	7	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**	**General Education**	**Social**
4	( )		

MEASURING AND EVALUATION ACTIVITIES	**THEORETICAL AND TUTORIAL COURSES**			**LABORATORY COURSES**		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	25	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	50			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	Physics I, Analyses I-II, Mathematical Methods for Physics I-II
SHORT COURSE CONTENT	Mechanics of a system of particles, D'alembert's Principle and Lagrange's equations, Lagrange equations and simple applications, Variation principles and Lagrange equations, Hamilton equations and simple applications
OBJECTIVES OF THE COURSE	To provide a conceptual understanding of the events related with classical mechanics to the students and to develop their problem-solving skills.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	In practice, varieties of physical systems solve problems using different methods within the boundaries of classical physics and but also improve their ability to practice in daily life.
LEARNING OUTCOMES OF THE COURSE	Learn how to use different methods to solve various physical problems.
MAIN TEXTBOOK	Klasik Mekanik, Emine Rızaoğlu, Naci Sünel, okutman yayıncılık, 2008
SUPPORTING REFERENCES	- Mekanik , D.Mehmet Zengin, Cevat Selam, Sabit Koçak, Bilim yayıncılık, 1999 - Klasik Mekanik, T.W. Kibble and F.H. Berkshire, Çvr: Kemal Çolakoğlu, Palme yaıncılık, 1999 - Classical Mechnaics, Herbert Goldstein, Addison Wesley
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Vectors
2	Kinematic
3	Newton's law
4	Variable mass systems
5	Midterm Exam 1
6	Motions in central forces
7	Particles systems
8	The principle of virtual works
9	Dalembert principle
10	Midterm Exam 2
11	Lagrange equations, Lagrange formulations and basic applications
12	Lagrange equations, Lagrange formulations and basic applications
13	Hamilton formulations and basic applications
14	Hamilton formulations and basic applications
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES
(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			x		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.				x	
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		x			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			x		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			x		
9	Ethical and professional responsibility.	x				
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			x		
12	To have knowledge about the modern problems that are local and global.			x		

ESOGU Physics Department Course Information Form

COURSE CODE: 121315415   **COURSE NAME:** ELECTROMAGNETIC TEORY

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
Autumn	4	0	4	7	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
4	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					
PREREQUISIT(S) IF ANY	-					
SHORT COURSE CONTENT	Vector Analysis, Coulomb's Law and Electric Field Intensity, Electric Flux Density, Gauss Law and Divergence, Energy and Potential, Conductors, Dielectrics and Capacitance, Magnetic Field and Biot-Savart Law.					
OBJECTIVES OF THE COURSE	Properties of Electromagnetic Waves					
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Importance of Electromagnetic Waves					
LEARNING OUTCOMES OF THE COURSE						
MAIN TEXTBOOK	Engineering Electromagnetics, W.H.Hayt, Boston, 2001					
SUPPORTING REFERENCES	1. Elektromanyetik Teori, D.J.. Griffiths (Çev. B. ÜNAL), Gazi Kitabevi, Ankara, 2005 2. Elektromanyetik, J.A.Edminister (Çev. M.T.AYDEMİR v.d.), Nobel Yayın Dağıtım, Ankara, 2000.					
NECESSARY COURSE MATERIALS						

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Scalars and Vectors, The Cartesian, Cylindrical and Spherical Coordinate Systems
2	The Dot and Cross Product
3	Electric Field for Point, Line, Sheet and Volume Charge Distrubutions
4	Electrik Flux Density, Gauss!s Law
5	Midterm Exam 1
6	Divergence and Divergence Theorem
7	Energy Expended in Moving a Point Charge in an Electric Field
8	The Potential Field of a System of Charges
9	Potential Gradient, Energy Density in the Electrostatic Field
10	Midterm Exam 2
11	Current and Current Density, Conductor Properties and Boundry Conditions
12	The Method of Images, The Nature of Dielectric Materials
13	Boundry Conditons for Perfect Dielectric Materials, Capacitance
14	Magnetic Field and Biot-Savart Law
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES

(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	X				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.				X	
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.			X		
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.				X	
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.			X		
9	Ethical and professional responsibility.			X		
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.					X
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.			X		
12	To have knowledge about the modern problems that are local and global.				X	

ESOGU Physics Department Course Information Form

COURSE CODE: 121316353   **COURSE NAME:** Quantum Physics II

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
6	4	0	4	7	COMPULSORY (X) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).				
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**		**General Education**	**Social**
4	( )			

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	Number	%	Activity type	Number	%
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	Applications of the Schrödinger equation in three dimensions, angular momentum and spin, approximate methods and perturbation theory, symmetry and transformations, systems of identical particles.
OBJECTIVES OF THE COURSE	To introduce the principles and the general formalism of quantum mechanics, and to make their applications.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Students will learn the concepts of modern physics in investigation of natural phenomena. Meanwhile, students will do solutions for these phenomena by means of the quantum mechanical point of view. Applying the quantum mechanical equations of motion in the identical particle systems of micro universe, students will understand its importance in daily life applications such as electronics, semiconductor technology.
LEARNING OUTCOMES OF THE COURSE	1. Understand the fundamental principles and concepts of quantum physics. 2. Knowledge of examining identical particle systems. 3. Understand natural phenomena by the quantum mechanical point of view. 4. Apply knowledge of natural sciences (Physics, Chemistry, Mathematics). 5. Justify and analyze natural phenomena. 6. Identify, formulate, and solve field related problems. 7. Interdisciplinary knowledge association and application. 8. Direct correlation and application of gained knowledge with technology and industry. 9. Get an understanding of professional and ethical responsibility. 10. Get a recognition of the need for, and an ability to engage in life-long learning. 11. Gain a knowledge of contemporary issues.
MAIN TEXTBOOK	Karaoğlu, B., "Kuantum mekaniğine giriş", Seçkin Yayıncılık, Ankara, 2008.
SUPPORTING REFERENCES	1. Griffiths, D. J., Translation: Özbek, H., Feyiz, S. D., "Kuantum Mekaniğine Giriş", Nobel Yayınları, Ankara, 2010. 2. Gasiorowicz, S., "Quantum physics (3rd edition)", John Wiley & Sons, New Jersey, 2003. 3. Aygün, E., Zengin D. M., "Kuantum Fiziği", Bilim Yayınları, Ankara, 1992. 4. Erbil, H., "Kuantum Fiziği-I", Ege Üniversitesi Yayınları, İzmir, 2001.

	5. Budak, G., Karabulut A., "Kuantum Fiziği I", Nobel Yayınları, Ankara, 2007. 6. Liboff, R. L., "Kuantum mekaniğine giriş", Addison-Wesley, New York, 1988. 7. Landau, L.D., Lifshitz, E. M., Çeviri: Zengin, M. Selam, C. Korcak, S., "Kuantum Mekaniği", Bilim Yayınları, Ankara, 2000. 8. Zettili, N., "Quantum mechanics", John Wiley &Sons, New York, 2001.
NECESSARY COURSE MATERIALS	

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Spherically symmetric potential
2	Hydrogen atom and the solutions of its Schrödinger equation
3	Angular momentum algebra
4	Spin, and applications with spin wave functions
5	Midterm Exam 1
6	Perturbation expansion
7	Variational method
8	Symmetry and symmetry operations
9	Unitary transformations
10	Midterm Exam 2
11	Symmetry and conservation laws
12	Identical particle systems and their properties
13	Problem of the helium atom
14	Systems with N-particles, and their applications
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)						
NO	**PROGRAM OUTCOME**	**5**	**4**	**3**	**2**	**1**
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.				x	
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.		x			
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.	x				
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.		x			
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				

9	Ethical and professional responsibility.	x				
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.			x		
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.		x			
12	To have knowledge about the modern problems that are local and global.	x				

ESOGU Physics Department Course Information Form

COURSE CODE: 121316354   **COURSE NAME:** NUCLEAR PHYSICS

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
6	4	0	4	7	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week) of the course below (please share the credits if necessary).

Mathematics and Basic Sciences	Physics Subjects [Please depict (√) if the course include design significantly]	General Education	Social
3	( )		

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	Electromagnetic Theory I & II, Quantum Physics I & II
SHORT COURSE CONTENT	Atomic nucleus and its properties Nucleon-nucleon interactions Properties of the nuclear force Nuclear models Radioactive decay
OBJECTIVES OF THE COURSE	Study the structure and properties of the atomic nucleus theoretically and compare them with experimental results
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	We aimed at introducing students to professions which are directly related to the nuclear physics by giving details of application areas of nuclear physics and organizing seminars in this area.
LEARNING OUTCOMES OF THE COURSE	Understand properties of the nuclear force and applications of nuclear physics to other areas of research and technology
MAIN TEXTBOOK	"Nuclear Physics I and II" K. S. Krane, 1988, John Wiley & Sons, Inc.
SUPPORTING REFERENCES	"Çekirdek Fiziğine Giriş" W.N. Cottingham-D.A. Greenwood Çeviri: İ. Açıkgöz, S. Yıldırım, 2001. "Nükleer Fizik" B. Tanyel, Ege Üniversitesi Basımevi, 1994. "Nükleer Fizik Problemleri" Ş. Özkök, Çağlayan Kitabevi, İstanbul "Nuclear and Particle Physics" W.S.C.Williams, Oxford Science Publications, 1991.
NECESSARY COURSE MATERIALS	Nuclear Physics Research Lab.

COURSE SCHEDULE	
WEEK	**SUBJECTS**
1	Atomic models, basic concepts in nuclear physics, units and dimensions
2	Quantum statistics, fermions, bosons, angular momentum, and parity
3	Nuclear properties I: nuclear radius, mass, nuclear binding energy in ground state
4	Nuclear properties II: semi empirical mass formula, nuclear electromagnetic moments
5	Midterm Exam 1
6	The force between the nucleons, deuteron
7	The properties of the nuclear force, the exchange force model
8	The shell model of the nucleus
9	Collective models: nuclear vibrations, nuclear rotations
10	Midterm Exam 2
11	Radioactive decay I: the radioactive decay law, half-life, mean lifetime
12	Radioactive decay II: natural radioactivity, radioactive series
13	Radioactive decay III: radioactive dating, units of measuring radiation
14	Interactions of radiation with matter, measuring nuclear radiation
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)						
NO	**PROGRAM OUTCOME**	**5**	**4**	**3**	**2**	**1**
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modeling and solving of physics problems by the theoretical and experiential information about these areas.	X				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modeling method for the complex physics problems about physics and related areas.	X				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.			X		
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.	X				
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.	X				
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.		X			
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.			X		
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	X				
9	Ethical and professional responsibility.	X				
10	Knowledge about project management, risk management and change management and awareness about sustainable development, innovativeness, entrepreneurship.		X			
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.	X				
12	To have knowledge about the modern problems that is local and global.	X				

COURSE CODE: 121316355   **COURSE NAME:** Thermodynamic and Statistical Physics

SEMESTER	NUMBER OF COURSE HOURS PER WEEK		COURSE		
	Theory	**Tutorial**	**Credit**	**ECTS**	**TYPE**
6	4	0	4	7	COMPULSORY (x) ELECTIVE ( )

Please depict the credit (for non-credit courses, number of course hours per week)of the course below (please share the credits if necessary).				
Mathematics and Basic Sciences	**Physics Subjects [Please depict (√) if the course include design significantly]**		**General Education**	**Social**
4	( )			

MEASURING AND EVALUATION ACTIVITIES	THEORETICAL AND TUTORIAL COURSES			LABORATORY COURSES		
	Activity type	**Number**	**%**	**Activity type**	**Number**	**%**
MIDTERM	Midterm Exam	2	20	Midterm Exam		
	Quiz			Experimenting Performance		
	Homework			Reporting		
	Project			Oral Exam or Quiz		
	Other (………)			Other (………)		
FINAL EXAM		1	60			
MAKE UP EXAM (Oral/Written)	Written					

PREREQUISIT(S) IF ANY	-
SHORT COURSE CONTENT	To reach macroscopic structure from microscopic structure
OBJECTIVES OF THE COURSE	To teach how to investigate microscopic and macroscopic cases with the concepts of statistical physics, and to introduce their possible relations.
CONTRIBUTION OF THE COURSE TO THE PROFESSIONAL TRAINING	Sense of events in the universe through the world of micro-states
LEARNING OUTCOMES OF THE COURSE	The number of microstate applies for different systems and different particle types.
MAIN TEXTBOOK	İSTATİSTİK FİZİK, Berkeley Fizik Dersleri, Cilt 5, F. REIF.
SUPPORTING REFERENCES	
NECESSARY COURSE MATERIALS	

**COURSE SCHEDULE**
WEEK	**SUBJECTS**
1	Introduction to statistics physics,
2	Probability
3	Entropy and its probability conclusion
4	Binomial distribution, Poisson distribution function
5	Midterm Exam 1
6	Microstates
7	Statistical clusters
8	Micro canonical clusters
9	Canonical clusters
10	Midterm Exam 2
11	Investigations of gases with statistical physics,
12	Quantum statistical physics
13	Grand canonical clusters
14	Bose-Einstein, Fermi-Dirac and Maxwell Boltzman Statics
15,16	Final Exam

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES

(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOME	5	4	3	2	1
1	Having sufficient knowledge about mathematics, physics and the skill of applying for modelling and solving of physics problems by the theoretical and experiential informations about these areas.	x				
2	Skill of defining, identifying, formulating and solving by selecting and applying appropriate analysis and modelling method for the complex physics problems about physics and related areas.	x				
3	Skill of design a complex system, device or product by applying the modern design methods under realistic constraints and conditions according to a specified objective.		x			
4	Skill of the effective usage of information technology, selection, development and usage of the modern techniques and tools which are necessary for the application of physics.			x		
5	An ability of designing of the experiment, experimentation, collecting data, analyzing and interpreting the results for the investigation of problems of the chemical engineering.		x			
6	An ability of having disciplinary and interdisciplinary teamwork and ability of individual working.			x		
7	Skill of effective communication orally and in writing in Turkish and ability of using/improving the knowledge of foreign language.				x	
8	An awareness of the necessity of life-long learning; accessing to the information, following the scientific and technological developments and ability of renew oneself continuously.	x				
9	Ethical and professional responsibility.		x			
10	Knowledge about project management, risk management and change management and an awareness about sustainable development, innovativeness, entrepreneurship.				x	
11	The knowledge about the effects of physics practices socially and globally which are related to health, environment and security; awareness about the legal results of physical solutions and national and international legal regulation and the standards.				x	
12	To have knowledge about the modern problems that are local and global.			x		