ENERGY SYSTEMS ENGINEERING EDUCATION PLAN

(After 2025-2026)

FIRST SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
PHYS	101	General Physics I	(4-0)4	5	
PHYS	111	General Physics Lab I	(0-2)1	2	
MATH	141	Basic Calculus I	(3-2)4	5	
CHEM	121	General Chemistry I	(3-0)3	5	
CHEM	141	General Chemistry Lab I	(0-2)1	2	
ENG	101	Development of Reading and Writing Skills I	(3-0)3	3	
ESE	101	Introduction to Energy Systems Engineering	(2-0)2	5	
ME	113	Computer Aided Technical Drawing I	(2-2)3	3	
			21	**30**	

SECOND SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
PHYS	102	General Physics II	(4-0)4	5	
PHYS	112	General Physics Lab II	(0-2)1	2	
MATH	142	Basic Calculus II	(3-2)4	6	
CHEM	122	General Chemistry II	(3-0)3	5	
CHEM	142	General Chemistry Lab II	(0-2)1	2	
ENG	102	Development of Reading and Writing Skills II	(3-0)3	3	
ESE	104	Introduction to Computer Programming	(2-2)3	4	
MATH	265	Basic Linear Algebra	(3-0)3	4	
GCC	101	Career Planing and Development	(2-0)NC	2	
			22	**33**	

THIRD SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	201	Thermodynamics I	(2-2)3	6	
MATH	255	Differential Equations	(4-0)4	6	
ME	221	Statics	(3-0)3	5	
MSE	211	Materials Science and Engineering	(3-0)3	5	
HIST	201	Principals of Atatürk I	(2-0)NC	2	
TURK	201	Turkish Language I	(2-0)NC	2	
		Non-technical Elective	(3-0)3	3	
			16	**29**	

FOURTH SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	202	Thermodynamics II	(2-2)3	6	ESE 201
ESE	204	Measurement Techniques	(2-2)3	5	
ESE	212	Numerical Methods in Energy Systems Engineering	(3-2)4	6	ESE104 and MAHT141

ESE	230	Fundamentals of Electrical and Electronic Circuits	(3-0)3	4	
ESE	232	Probability and Statistics	(3-0)3	5	
HIST	202	Principals of Atatürk II	(2-0)NC	2	
TURK	202	Turkish Language II	(2-0)NC	2	
			16	**30**	
FIFTH SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	301	Heat Transfer	(4-0)4	6	
ESE	311	Fluid Mechanics I	(3-0)3	6	
ESE	321	Mass and Energy Balances	(3-0)3	5	
ESE	331	Electromechanical Energy Conversion	(4-0)4	6	
		Restricted Elective	NC	7	
			14	**30**	
SIXTH SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	312	Fluid Mechanics II	(3-0)3	6	ESE 311
ESE	322	Mass Transfer	(3-0)3	6	
ESE	342	Energy Systems Engineering Economics	(3-0)3	5	
ME	352	System Analysis and Control	(4-0)4	5	
		Technical Elective	(3-0)3	5	
ENG	302	Technical Writing and Communication	(3-0)3	3	
			19	**30**	
SEVENTH SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	401	Energy Systems Engineering Design I	(3-2)4	8	
		Technical Elective	(3-0)3	5	
		Technical Elective	(3-0)3	5	
		Technical Elective	(3-0)3	5	
		Restricted Elective	NC	7	
			13	**30**	
EIGHT SEMESTER					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
		Restricted Elective	(2-4)4	11	ESE 401
MAN	211	Communicational and Management Skills for Engineers	(3-0)NC	3	
		Non-technical Elective	(3-0)3	3	
		Non-technical Elective	(3-0)3	3	
		Technical Elective	(3-0)3	5	
		Technical Elective	(3-0)3	5	
			16	**30**	
		TOTAL CREDITS	**137**	**242**	

ENERGY SYSTEMS ENGINEERING ELECTIVE COURSE LIST

Restricted Electives					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	300	Summer Practice I	NC	7	
ESE	400	Summer Practice II	NC	7	
ESE	402	Energy Systems Engineering Design II	(2-4)4	11	ESE401

Technical Electives					
Code		**Name**	**Credits**	**ECTS**	**Prerequisite/ Corequisite**
ESE	404	Engineering Mathematics	(3-0)3	5	MATH255
ESE	405	Heat Exchanger Design	(3-0)3	5	
ESE	406	Introduction to Geothermal Energy	(3-0)3	5	
ESE	407	Energy Efficiency	(3-0)3	5	
ESE	408	Exergy	(3-0)3	5	
ESE	409	Heating Ventilating and Air Conditioning	(3-0)3	5	ESE312
ESE	410	Introduction to Wind Energy	(3-0)3	5	
ESE	411	Geographic Information Systems for Energy Systems Engineers	(3-0)3	5	
ESE	420	Introduction to Bioenergy	(3-0)3	5	
ESE	421	Unit Operations in Energy Processes	(3-0)3	5	
ESE	422	Waste to Energy	(3-0)3	5	
ESE	423	Hydrogen Energy and Fuel Cells	(3-0)3	5	ESE201 ve ESE202
MTH	424	Hydrogen and Fuel Cell Technology	(3-0)3	5	ESE201 ve ESE202
MTH	425	Climate Change Oriented Planning	(3-0)3	5	
MTH	426	Modelling and Simulation of Enery-Oriented Chemical Processes	(3-0)3	5	ESE321
ESE	431	Introduction to Power System Analysis	(3-0)3	5	
ESE	432	Power System Analysis and Control	(3-0)3	5	ESE 431
ESE	440	Introduction to Computational Fluid Dynamics	(2-2)3	5	ESE301 ve ESE311
ESE	441	Introduction to Flow Through Porous Media	(3-0)3	5	ESE311
ESE	442	Chemistry in Geothermal Systems	(3-0)3	5	
ESE	443	Integrative Energy Systems for Buildings	(3-0)3	5	
ESE	498	Supplementary Curricular Courses	(3-0)3	5	
ESE	499	Cooperative Education Course	(0-6)3	5	

NOTE: Energy Systems Engineering Department students can take technical elective courses from other departments at IZTECH, provided that they are related to the field of Energy Engineering and have the approval of the advisor.