

## FACULTY OF ENGINEERING

Faculty of Engineering was established in 1993. The Faculty consists of Computer Engineering, Environmental Engineering, Electrical and Electronics Engineering, Industrial Engineering, Civil Engineering, Chemical Engineering, Materials Science and Engineering, and Mechanical Engineering departments. The Faculty of Engineering is located in the new and modern buildings of İki Eylül Campus. All the students attend one-year English Preparation School before four-year undergraduate programs. Most of the courses in undergraduate program are taught in English.

Faculty of Engineering aims at giving high quality education to students to carry out professional work after graduation. All departments in the Faculty have modern computer facilities and research laboratories.

Turkish Science and Research Council (TÜBİTAK), State Planning Office and University Research Foundation support various projects conducted in the departments of the Faculty. The Faculty of Engineering and Architecture also conducts projects in collaboration with Local and Nation wide companies. There are also cooperative links with universities and research institutions in the U.S.A., Europe and Japan.

Dean	: Prof. Dr. Hanife APAYDIN ÖZKAN
Vice-Dean	: Asst. Prof. Dr. E. Zafer HOŞGÜN
Vice-Dean	: Asst. Prof. Dr. M. İnanç ONUR
Secretary to the Faculty	: Mehmet GÜL

### STAFF

#### Professors:

Emin AÇIKKALP, Elif ÖDEŞ AKBAY Hüseyin AKÇAY, Cemail AKSEL, Hanife APAYDIN ÖZKAN, Esin APAYDIN VAROL, Gürsoy ARSLAN, Nuray AT, Funda ATEŞ, Özgür AVŞAR, Feridun AY, Nezihe AYAS, Aydın AYBAR, Recep BAKIŞ, Müfide BANAR, Ahmet BAYLAR, Berrin BOZAN, Hande ÇELEBİ, Arzu ÇİÇEK, Oğuz ÇOLAK, Atakan DOĞAN, Aydın DOĞAN, Tuncay DÖĞEROĞLU, Nihal ERGİNEL, Tansu FİLİK, Eftade GAGA, Kadir GEDİK, Hasan Ferdi GERÇEL, Özgül Ege GERÇEL, Ömer Nezihe GEREK, Serdar GÖNCÜ, Serkan GÜNAL, Altuğ İFTAR, Cihan KALELİ, Alpavut KARA, Ferhat KARA, Bekir KARASU, Refail KASIMBEYLİ, Onur KAYA, Süleyman KAYTAKOĞLU,, Ö. Mete KOÇKAR, Nihan KOSKU PERKGÖZ, Semra KURAMA, Semra MALKOÇ, R. Mustafa ÖKSÜZOĞLU, Gökhan ÖZDEMİR, M. Tankut ÖZGEN, Aysun ÖZKAN, Gürkan ÖZTÜRK, Cengiz ÖZZAİM, Cem SEVİK, Abdullah Tuğrul SEYHAN, Ender SUVACI, Ünal ŞEN, Aynur ŞENSOY ŞORMAN, Mustafa TOMBUL, Ahmet TUNCAN, Mustafa TUNCAN, Servet TURAN, Ümran ÜN, Yusuf YAVUZ

#### Associate Professors:

Levent AKYALÇIN, Sema AKYALÇIN, Mehmet ALEGÖZ, Nil ARAS, Ahmet ARSLAN, Erhan AYAS, Ümmühan BAŞARAN FİLİK, Sinem BAŞKUT, Filiz BAYRAKCI KAREL, Ali BOZER, Ali ÇELİK, Ahmet Ozan ÇELİK, Emre ÇİMEN, Elif DEMİREL, Elif Begüm ELÇİÖĞLU, Burak EVİRGİN, Emin GERMEN, Yeşim GÜÇBİLMEZ, Zerrin GÜNKAYA, Zehra KAMIŞLI ÖZTÜRK, Fadime KARAER, İrfan KAYA, Serkan KIVRAK, Mehmet KOÇ, Hakan ŞİRİN, Ali Arda ŞORMAN, Gökçen UYSAL, Hakkı Ulaş ÜNAL, Haluk YAPICIOĞLU, Tolga YASA, Zehra YİĞİTAVDAN,

#### Faculty Members:

Müge ACAR, Şener AĞALAR, Emine AKYOL ÖZER, Evren ARIÖZ, Eren BALABAN, İlker BALCILAR, Zeynep BATMAZ, Suzan BİRAN AY, Fatma BİRİNCİ KAYAALP, Sema CANDEMİR, Yasemin ÇELİK, Gülçin DİNÇ YALÇIN, Leman Esra DOLGUN, Emrah DÖLEKÇEKİÇ, Zeliha ERGÜL, Hüseyin Ersin EROL, Zeynep İdil ERZURUM ÇİÇEK, Emine Esra GEREK, Mert GÜL, Çağla Gül GÜLDİKEN, Sıtkı GÜNER, Emir Zafer HOŞGÜN, Selcan KAPLAN BERKAYA, Zühal KARTAL, Nergiz KASIMBEYLİ, Bekir Tuna KAYAALP, Elif KAYNAK, Murat KILIÇ, Mehmet KILIÇARSLAN, Seval KINDEN, Altan ONAT, Mehmet İnanç ONUR, Seren ÖCAL, Asım Anıl ÖNDER, Derya ÖVER, Yalçın ÖZDEMİR, Alp ÖZDEMİR, Özlem ÖZDEN ÜZMEZ, İsmail Özgür ÖZER, Erdem ÖZYURT, Cahit PERKGÖZ, H. Boğaç POYRAZ, Özgür POYRAZ, Umut SAVACI, Gül İpek SELİMOĞLU, Hasan ŞAHİN, Burcu ŞİMŞEK UYGUN, Kıvanç TAŞKIN, İrfan TÖRE, Onur TUNABOYU, Fatih TURAN, Semiha TÜRKAY, Can UYSAL, Sevcan YILMAZ GÜNDÜZ, Burcu YILMAZEL Abdulkadir ZİREK

#### Lecturers:

Orkun BAŞKAN, Esra FINDIK, Banu GÜNER, Emre KAÇMAZ, Muhammed ÖZSOY, Özgür ÖZŞEN, Muhsin YALÇIN

#### Research Assistants:

Zeynep AKTAŞ Oğuzkağan ALIÇ, Aslı ALTIPARMAK, Ahmet AYDIN, Perihan BEKDEMİR, Muhammet Hamza BEKGÖZ, Canberk BOLAT, Gürhan CEYLAN, Burak DEMİR, Emrah DEMİR, Emin Talip DEMİRKIRAN, Harun Şenol DEMİROĞLU, Enes İbrahim DÜDEN, Özge EROL, Emine ERSEZER, Şehnaz GENÇ, Gökhan GÖKSEL, Hakkı Deniz GÜL, Kübra GÜRCAN BAYRAK, Banu İÇMEN, Ertuğrul İŞLEK, İlhan KAHRAMAN, Mutlu KARASOĞLU, Eren KAYA, Kübra KİBAR, Burcu KİREN, Volkan KİRİÇÇİ, Okan KOÇKAYA, Levent KÖROĞLU, Handan KÜNKÇÜ, Ramazan MACİT, Talha ORHAN, Kerim ÖRÜKLÜ, Nesil ÖZBAKAN, Mehmet ÖZCAN, Salih Çağrı ÖZER, Özlem BAŞAK ÖZKAN, Mahmut ÖZTÜRK, Hatice Mine SAĞDIÇ ULUSOY, Mustafa Burak SAĞENER, Fırat SEZGİN, Ali SOLAK, Murat TAMER, Tansu TEMEL, Şura TOPTANCI, Emre URAZ, Fikret YAMAN, Özen YELBAŞ

## DEPARTMENT OF COMPUTER ENGINEERING (ENGLISH)

The Department was established in 1993. The department is located at the İki Eylül Campus and occupies a covered area of 5000 m<sup>2</sup>. The decisions related with the department are made by the department council which is composed of all faculty members of the department. Department Web Page: <https://ceng.eskisehir.edu.tr/>

Department Head : Prof. Dr. Serkan GÜNAL  
Deputy Department Head : Asst. Prof. Dr. Selcan KAPLAN BERKAYA  
Deputy Department Head : Asst. Prof. Dr. Mehmet KILIÇARSLAN

### PROGRAM

#### I.Semester

BİM 101	(Eng)	Computer Programming I	3+2	7,0
EKİM 105	(Eng)	General Chemistry	4+0	6,0
EMAT 111	(Eng)	Calculus I	4+2	7,5
FİZ 105	(Eng)	Physics I	4+0	6,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5
TÜR 125		Turkish Language I	2+0	2,0

#### II.Semester

BİM 108	(Eng)	Computer Programming II	2+2	6,0
BİM 122	(Eng)	Discrete Computational Structures	3+0	5,0
EMAT 112	(Eng)	Calculus II	4+2	7,5
FİZ 106	(Eng)	Physics II	4+0	6,0
FİZ 108	(Eng)	Physics Laboratory II	0+2	1,5
TÜR 126		Turkish Language II	2+0	2,0

Seçmeli Dersler 2,0

30,0

30,0

#### III.Semester

BİM 203	(Eng)	Logic Design	4+0	6,0
BİM 207	(Eng)	Computer Programming III	2+2	6,0
BİM 209	(Eng)	Principles of Software Design and Development	3+0	6,0

#### IV.Semester

BİM 204	(Eng)	Numeric Analysis for Computer Engineers	3+0	3,5
BİM 214	(Eng)	Computer Programming IV	2+2	5,5
BİM 216	(Eng.)	Database Management Systems	2+2	6,0

BİM 213	(Eng)	Data Structures and Algorithms	2+2	5,5	BİM 222	(Eng)	Internet Programming	3+0	4,5
MAT 249	(Eng)	Linear Algebra and Differential Equations	3+0	4,5	BİM 314	(Eng)	Theory of Computation	3+0	4,5
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	İST 252	(Eng)	Probability and Statistics	3+0	4,0
					TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
				30,0					30,0

### V.Semester

BİM 303	(Eng)	Microcomputers	3+2	7,0
BİM 305	(Eng)	Computer Organization	3+0	5,0
BİM 311	(Eng)	Systems Analysis and Design	3+0	4,5
MAT 247	(Eng)	Engineering Mathematics	4+0	7,0
		Area Elective Courses		4,5
		Elective Courses		2,0
				30,0

### VI.Semester

BİM 324	(Eng)	Computer Networks	2+2	4,5
BİM 218	(Eng)	Operating Systems	2+2	4,5
BİM 304	(Eng)	Computer Algorithm Design	3+0	6,0
BİM 308	(Eng)	Web Server Programming	3+0	6,0
BİMSJ 302	(Eng)	Computer Engineering Internship I	0+2	2,5
		Area Elective Courses		4,5
		Elective Courses		2,0
				30,0

**VII.Semester****VIII.Semester**

BİM 437	(Eng)	Computer Engineering Design	1+2	4,0	BİM 444	(Eng)	Computer Engineering Applications	2+4	7,0
BİMSJ 401	(Eng)	Computer Engineering Internship II	0+2	2,5	İSG 402		Occupational Health and Safety II	2+0	2,0
İSG 401		Occupational Health and Safety I	2+0	2,0			Area Elective Courses		18,0
		Area Elective Courses		18,0			Elective Courses		3,0
		Elective Courses		3,5					
				<hr/>					<hr/>
				30,0					30,0

**Area Elective Courses**

BİM 309	(Eng)	Artificial Intelligence	3+0	4,5	BİM 468	(Eng)	Computer Aided Design	3+0	4,5
BİM 460	(Eng)	Software Modelling (Yazılım Modelleme)	3+0	4,5	BİM 498	(Eng)	Embedded Software Design	3+0	4,5
BİM 405	(Eng)	Project Management	3+0	4,5	BİM 447	(Eng)	Introduction to Deep Learning	3+0	4,5
BİM 423	(Eng)	Software Engineering	3+2	6,0	BİM 461	(Eng)	Introduction to Cloud Computing	3+0	4,5
BİM 439	(Eng)	Applications of Database Management Systems	3+0	4,5	BİM 463	(Eng)	Introduction to Natural Language Processing	3+0	4,5
BİM 441	(Eng)	Introduction to Rough Sets Theory	3+0	4,5	BİM 470	(Eng)	Neural Networks	3+0	4,5
BİM 443	(Eng)	Blockchain and Cryptocurrency Technologies	3+0	4,5	BİM 472	(Eng)	Image Processing	3+0	4,5
BİM 445	(Eng)	Enterprise IT Architecture	2+0	3,0	BİM 474	(Eng)	Introduction to Cryptography	3+0	4,5
BİM 446	(Eng)	Analysis of Algorithms	3+0	4,5	BİM 476	(Eng)	Data Acquisition and Processing	3+0	4,5

BİM 448	(Eng)	Computer Graphics	3+0	4,5	BİM 478	(Eng)	Management Information Systems	3+0	4,5
BİM 449	(Eng)	Introduction to Game Programming	3+0	4,5	BİM 480	(Eng)	Compiler Design	3+0	4,5
BİM 450	(Eng)	Network Management	3+0	4,5	BİM 482	(Eng)	Network Programming	3+0	4,5
BİM 451	(Eng)	Web Server Programming with MVC	3+0	4,5	BİM 484	(Eng)	Distributed Systems	3+0	4,5
BİM 452	(Eng)	Multimedia Computing	3+0	4,5	BİM 485	(Eng)	Research in Computer Science I	3+0	4,5
BİM 453	(Eng)	Introduction to Machine Learning	3+0	4,5	BİM 486	(Eng)	Research in Computer Science II	3+0	4,5
BİM 454	(Eng)	Programming Language Concepts	3+0	4,5	BİM 488	(Eng)	Introduction to Pattern Recognition	3+0	4,5
BİM 455	(Eng)	Introduction to Hardware Design	3+0	4,5	BİM 490	(Eng)	Introduction to Information Retrieval	3+0	4,5
BİM 456	(Eng)	Network Security Principles	3+0	4,5	BİM 492	(Eng)	Design Patterns	3+0	4,5
BİM 457	(Eng)	Embedded Programming Languages	3+0	4,5	BİM 493	(Eng)	Mobile Programming I	3+0	4,5
BİM 458	(Eng)	Simulation and Modelling	3+0	4,5	BİM 494	(Eng)	Mobile Programming II	3+0	4,5
BİM 459	(Eng)	Artificial Intelligence in Healthcare	3+0	4,5	BİM 496	(Eng)	Computer Vision	3+0	4,5
BİM 462	(Eng)	Parallel Systems	3+0	4,5	EEM 305	(Eng)	Signals and Systems	3+0	4,5
BİM 464	(Eng)	Human-Computer Interaction	3+0	4,5	EEM 334	(Eng)	Digital Systems II	3+0	5,0
BİM 465	(Eng)	Introduction to Data Science	3+0	4,5	MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5
BİM 466	(Eng)	Fuzzy Logic	3+0	4,5					

## Elective Courses

ANT 452	First Aid	1+2	4,0	İLT 201	(Eng)	Interpersonal Communication	3+0	4,5
ARK 108	Archaeology	2+0	2,0	İLT 201		Interpersonal Communication	3+0	4,5
BEÖ 155	Physical Education	2+0	2,0	İLT 419		Body Language and Diction	2+0	5,0
BEÖ 176	Trekking	1+2	4,0	İSN 309	(Eng)	Mass Media	3+0	3,0
BİM 411	(Eng) Decision Support Systems	3+0	3,0	İSN 409		Organizational Communication	4+0	4,0
ESTÜ 101	Introduction to University Life	0+1	2,0	İSP 151	(Spa)	Spanish I	4+0	4,0
ESTÜ 102	(Eng) Negotiation Techniques Class	2+0	3,0	İSP 152	(Spa)	Spanish II	4+0	4,0
ESTÜ 103	Ceramic Design Processes	2+1	3,0	İŞL 101	(İng)	Introduction to Business	3+0	4,5
ESTÜ 104	Academic and Life Skills	2+1	3,0	İŞL 101		Introduction to Business	3+0	4,5
ESTÜ 106	Project Management	2+1	3,0	İŞL 102		Management and Organization	3+0	4,0
ESTÜ 111	Volunteering Works	1+2	4,0	İŞL 209		Business Management	2+0	2,0
ESTÜ 112	Cyber Security for Everyone	2+0	2,0	İŞL 301	(Eng)	Human Resources Management	3+0	4,0
ESTÜ 113	Design Thinking	3+0	3,0	İŞL 301		Human Resources Management	3+0	4,0
ESTÜ 114	Visual Thinking	3+0	3,0	İŞL 321		Applied Entrepreneurship	3+1	5,0
ESTÜ 115	Photographic Viewpoint	2+1	3,0	İŞL 406		Strategic Management	3+0	4,5
ESTÜ 116	Computer Aided Design I	3+0	3,0	İŞL 421		Entrepreneurship	2+0	3,0

ESTÜ 117	Computer Aided Design II	3+0	3,0	İŞL 475		Techno-Entrepreneurship	3+0	4,0
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 119	Flute	3+1	3,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 120	Solfege	3+1	3,0	JAP 301	(Jap.)	Japanese I	4+0	4,0
ESTÜ 121	Piano	3+1	3,0	JAP 302	(Jap.)	Japanese II	4+0	4,0
ESTÜ 122	Guitar	3+1	3,0	MFALM 101	(Ger)	German for Engineering I	3+0	4,0
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MFALM 102	(Ger)	German for Engineering II	3+0	4,0
ESTÜ 125	Philosophy of Science	3+0	3,0	MFALM 201	(Ger)	German for Engineering III	3+0	4,0
ESTÜ 127	Diction	1+2	3,0	MFALM 202	(Ger)	German for Engineering IV	3+0	4,0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MUH 151		Introduction to Accounting	3+0	4,5
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MUH 151	(Eng)	Introduction to Accounting	3+0	4,5
ESTÜ 132	History of Political Thought	3+0	3,0	MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
ESTÜ 133	Disability and Awareness	3+0	3,0	MÜH 404	(Eng)	Innovation Management	3+0	3,0
ESTÜ 201	Turkish Sign Language	3+0	3,0	MÜZ 151		Short History of Music	2+0	3,0
ESTÜ 203	Introduction to Sociology	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0	2,0
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0	NÜM 301	(Eng)	Numerical Methods	3+0	3,5
ESTÜ 206	Financial Literacy	3+0	3,0	ÖMB 322		Ethics of Science and Research	2+0	3,0

ESTÜ 301	Science Communication	2+0	3,0	PSİ 102	(Eng)	Psychology	3+0	3,5
ESTÜ 307	Children Rights and Family Education	2+0	2,0	PZL 302	(Eng)	Marketing Management	3+0	4,5
ESTÜ 401	Introduction to Professional Life	1+1	2,0	REK 242		Sports Aviation	1+2	3,0
ESTÜ 402	Coaching and Leadership	3+0	3,0	RTV 281		Digital Literacy	2+2	4,0
ESTÜ 403	Basic Computer Utilization	3+0	4,0	RUS 255	(Rus.)	Russian I	3+0	4,0
ESTÜ 405	Computer Programming	3+0	5,0	RUS 256	(Rus.)	Russian II	3+0	4,0
FOT 202	Photography	2+0	3,0	SAĞ 102		First Aid	2+0	2,5
FRA 255	(Fra.) French I	3+0	4,0	SNT 155		History of Art	2+0	2,0
FRA 256	(Fra.) French II	3+0	4,0	THU 203		Community Services	0+2	3,0
HUK 458	Industrial Rights and Technological Development	3+0	3,0	TİY 121		Introduction to Theatre	2+0	3,0
İKT 151	(Eng) Economics	3+0	3,0	TİY 152		Theatre	2+0	2,5
İKT 356	(Eng) Engineering Economics	3+0	4,5	TİY 308		Republic Era Turkish Theatre	2+0	3,0

## **SOFTWARE AND OPTIMIZATION MINOR PROGRAM**

### **COMPULSORY COURSE GROUP I**

ENM203 Linear Programming	2+2	5,5
ENM212 Integer Programming and Network Models	2+2	6,0

### **COMPULSORY COURSE GROUP II**

ENM313 Mathematical Programming Models in Engineering (TÜR)	3+0	4,5
ENM450 Introduction to Metaheuristic Optimization	3+0	6,0



**COMPULSORY COURSE GROUP III**

BİM101 Computer Programming I	3+2	7,0
BİM209 Principles of Software Design and Development	3+0	6,0

**COMPULSORY COURSE GROUP IV**

BİM102 Computer Programming II	3+0	6,0
BİM304 Computer Algorithm Design	3+0	6,0

**TECHNICAL ELECTIVE COURSE GROUP I**

ENM313 Mathematical Programming Models in Engineering (TÜR)	3+0	4,5
ENM450 Introduction to Metaheuristic Optimization	3+0	6,0

**TECHNICAL ELECTIVE COURSE GROUP II**

ENM452 Introduction to Multiobjective Optimization	3+0	5,0
LOJ401 Logistics Management and Models	3+0	6,0

**TECHNICAL ELECTIVE COURSE GROUP III**

EEM480 Algorithms and Complexity	3+0	5,0
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**TECHNICAL ELECTIVE COURSE GROUP IV**

EEM449 Embedded System Design	2+2	5,0
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**TECHNICAL ELECTIVE COURSE GROUP V**

EEM528 GPU Computing	3+0	7,5
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**TECHNICAL ELECTIVE COURSE GROUP VI**

BİM102 Computer Programming II	3+0	6,0
BİM213 Data Structures and Algorithms	2+2	5,5

**TECHNICAL ELECTIVE COURSE GROUP VII**

BİM423 Software Engineering	3+2	6,0
BİM492 Design Patterns	3+0	4,5

**TECHNICAL ELECTIVE COURSE GROUP VIII**

BİM304 Computer Algorithm Design	3+0	6,0
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## DEPARTMENT OF ENVIRONMENTAL ENGINEERING (30% ENGLISH)

Environmental Engineering is profession to protect the environment from being polluted by human activities and conversely to protect humans from being affected adversely by the impacts of a polluted environment. The principal tasks of an environmental engineer are Design and management of the sanitary infrastructure and of water and wastewater treatment facilities. Air pollution abatement Solid waste management Protection of natural environments Noise pollution abatement Environmental assessment Legal and economical aspects of pollution control and prevention. The department was established in the 1994-1995 academic year. With the re-location of the Faculty of Engineering and Architecture to its new facility on İki Eylül Campus, the Environmental Engineering Department has improved its education with new classrooms, laboratories, computer labs and other physical facilities. Department Web Page: <https://cevre.eskisehir.edu.tr/>

Department Head : Prof. Dr. Aysun ÖZKAN  
Deputy Department Head : Asst. Prof. Dr. İlker BALCILAR  
Deputy Department Head : Asst. Prof. Dr. Alp ÖZDEMİR

### PROGRAM

I. Semester					II. Semester				
ÇEV 209	(Eng)	Technical English I	3+0	2,5	ÇEV 203	(Eng)	Introduction to Environmental Engineering	2+0	3,5
EKİM 101	(Eng)	General Chemistry I	4+0	6,0	EKİM 102	(Eng)	General Chemistry II	4+0	6,0
EMAT 111		Calculus I	4+2	7,5	EKİM 110	(Eng)	General Chemistry Laboratory	0+2	1,5
FİZ 105		Physics I	4+0	6,0	EMAT 112		Calculus II	4+2	7,5
FİZ 107		Physics Laboratory I	0+2	1,5	FİZ 106		Physics II	4+0	6,0
TRS 127		Technical Drawing	2+2	4,5	FİZ 108		Physics Laboratory II	0+2	1,5
TÜR 125		Turkish Language I	2+0	2,0	TÜR 126		Turkish Language II	2+0	2,0
							Elective Courses		2,0

III. Semester				IV. Semester					
ÇEV 210	(Eng)	Technical English II	2+0	2,0	BIY 353		Environmental Microbiology	3+0	3,0
ÇEV 211		Environmental Chemistry Laboratory I	0+3	2,0	BIY 357	(Eng)	Environmental Microbiology Lab	0+3	2,5
ÇEV 213		Environmental Chemistry I	3+0	3,0	ÇEV 206	(Eng)	Environmental Chemistry II	3+0	4,5
ÇEV219		Ecology	3+0	3,0	ÇEV 214		Environmental Ethics and Engineering Practices	2+0	2,0
EMAT 211		Differential Equations	2+2	4,5	ÇEV 216		Sustainability, Innovation and Project Management in Environmental Engineering	1+1	2,5
İKT 151		Economics	3+0	3,0	ÇEV212	(Eng)	Environmental Chemistry Lab.II	0+3	2,5
MLZ 203	(Eng)	Materials Science	3+0	3,5	EMAT 223		Linear Algebra and Numerical Methods	2+2	4,5
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	MEK 215	(Eng)	Statics and Strength of Materials	3+0	4,5
		Elective Courses		7,0	TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
							Elective Courses		2,0
				30,0					30,0

**V. Semester****VI. Semester**

ÇEV 305	(Eng)	Unit Operations and Processes I	4+0	5,0	EİST 201	Engineering Statistics	3+0	4,0
ÇEV 310		Water and Soil Pollution	3+0	3,0	ÇEV 312	Water Supply and Sewerage	3+0	3,0
ÇEV 316	(Eng)	Air Pollution	3+0	4,5	ÇEV 324	(Eng) Unit Operations and Processes II	4+0	6,0
ÇEV 321		National And International Environmental Legislation	2+0	2,0	ÇEV 342	(Eng) Unit Operations and Processes Laboratory	0+3	4,0
İNŞ 308	(Eng)	Hydrology	3+0	4,5	ÇEV 344	Solid Waste Management	3+1	4,0
MEK 315		Fluid Mechanics	3+2	5,0	ÇEV 427	(Eng) Air Pollution Control	3+0	4,5
		Area Elective Courses		6,0	TER 403	Thermodynamics	3+0	4,5
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**VII. Semester****VIII. Semester**

ÇEV 442		Hazardous Waste Management	3+0	4,0	ÇEV 450	Graduation Project in Environmental Engineering II	2+4	6,5
ÇEV 445	(Eng)	Environmental Modeling	3+0	4,5	ÇEV 438	Environmental Management	3+2	6,0
ÇEV 447	(Eng)	Wastewater Engineering	3+0	4,0	ÇEV SJ 402	Environmental Engineering Internship II	0+2	2,5
ÇEV 449		Graduation Project in Environmental Engineering I	1+2	3,0	İSG 402	Occupational Health and Safety II	2+0	2,0
ÇEV SJ 401		Environmental Engineering Internship I	0+2	2,5		Area Elective Courses		13,0

iSG 401	Occupational Health and Safety I	2+0	2,0				
	Area Elective Courses		10,0				
			30,0				30,0

### Area Elective Courses

ÇEV 482	Air Pollution Laboratory	1+2	3,0	ÇEV 468	Watershed Management	2+0	3,0
ÇEV 484	Small-scale Wastewater Treatment Systems	2+0	3,0	ÇEV 473	Water Quality Assessment	2+0	3,0
ÇEV 323	Bioremediation Technologies	2+0	3,0	ÇEV 477	Remote Sensing and GIS Applications in Environmental Sciences	2+0	3,0
ÇEV 325	Information Technologies in Environmental Engineering	2+0	3,0	ÇEV 479	Green Engineering Design and Sustainability	2+0	3,0
ÇEV 327	Green and Sustainable Agriculture	2+0	3,0	ÇEV 481	Sludge Treatment and Disposal	2+0	3,0
ÇEV 335	Disinfection of Water and Wastewater	1+1	3,0	ÇEV 483	Environmental Toxicology	1+1	3,0
ÇEV 346	Environmental Problems Resulting from Energy Production	2+0	3,0	ÇEV 485	(Eng) Environmental Exposure Assessment	2+0	3,0
ÇEV 348	(Eng) Instrumental Analysis in Environmental Studies	2+0	3,0	ÇEV 487	Water and wastewater treatment using membrane systems and processes	2+0	3,0
ÇEV 352	Environmental Health	2+0	3,0	ÇEV 491	Noise Pollution and Control	2+0	3,0
ÇEV 354	Environmental Footprints	2+0	3,0	ÇEV 492	Air Quality Management Project	1+2	4,0

ÇEV 356	Reuse of Wastewater for the Sustainability of Water Resources	2+0	3,0	ÇEV 493	Legislation Approach For Environmental Solutions	2+0	3,0
ÇEV 358	Global Climate Change	2+0	3,0	ÇEV 495	Air Pollution Meteorology and Atmospheric Dispersion	2+0	3,0
ÇEV 360	Corporate Sustainability Management	2+0	3,0	ÇEV 496	Microbiological Treatment Methods	2+0	3,0
ÇEV 362	Environment Economy	2+0	3,0	ÇEV 497	Industrial Wastewater Treatment	2+0	3,0
ÇEV 398	Environmental Auditing	2+0	3,0	ÇEV 499	Advanced Treatment of Water and Wastewater	3+0	4,0
ÇEV 431	Water Treatment Project	1+2	4,0	ÇEV340	Applied of Environmental Statistics Analysis	2+0	3,0
ÇEV 432	Wastewater Treatment Project	1+2	4,0	ÇEV498	Health-Care Waste Management	2+0	3,0
ÇEV 444	Solid Waste Management Project	1+2	4,0	MÜH 302	Interdisciplinary Applications	1+2	4,5
ÇEV 466	Ecological Planning and Ecotechnology	2+0	3,0				

#### Elective Courses

ANT 452	First Aid	1+2	4,0	İŞL 102	Management and Organization	3+0	4,0
ARK 108	Archaeology	2+0	2,0	İŞL 209	Business Management	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0	İŞL 321	Applied Entrepreneurship	3+1	5,0
BEÖ 176	Trekking	1+2	4,0	İŞL 406	Strategic Management	3+0	4,5
ÇEV 319	Scientific Reading and Writing Skills	2+0	3,0	İŞL 421	Entrepreneurship	2+0	3,0
ESTÜ 206	Financial Literacy	3+0	3,0	İŞL 454	(Eng) Management of Technology	3+0	4, 5

ESTÜ 101	Introduction to University Life	0+1	2,0	İŞL 475		Techno-Entrepreneurship	3+0	4,0
ESTÜ 106	Project Management	2+1 3,0	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 111	Volunteering Works	1+2	4,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 112	Cyber Security for Everyone	2+0	2,0	JAP301		Japanese I	4+0	4,0
ESTÜ 113	Design Thinking	3+0	3,0	JAP302		Japanese II	4+0	4,0
ESTÜ 114	Visual Thinking	3+0	3,0	KÜL 451	(Eng)	History of Science and Engineering	3+0	4, 5
ESTÜ 115	Photographic Viewpoint	2+1	3,0	MFALM 101	(Ger)	German for Engineering I	3+0	4,0
ESTÜ 116	Computer Aided Design I	3+0	3,0	MFALM 102	(Ger)	German for Engineering II	3+0	4,0
ESTÜ 117	Computer Aided Design II	3+0	3,0	MFALM 201	(Ger)	German for Engineering III	3+0	4,0
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	MFALM 202	(Ger)	German for Engineering IV	3+0	4,0
ESTÜ 119	Flute	3+1	3,0	MUH 151		Introduction to Accounting	3+0	4,5
ESTÜ 120	Solfege	3+1	3,0	MÜH 402		Engineering Ethics	2+0	3,0
ESTÜ 121	Piano	3+1	3,0	MÜH 404		Innovation Management	3+0	3,0
ESTÜ 122	Guitar	3+1	3,0	MÜZ 151		Short History of Music	2+0	3,0
ESTÜ 132	History of Political Thought	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0	2,0
ESTÜ 133	Disability and Awareness	3+0	3,0	ÖMB 322		Ethics of Science and Research	2+0	3,0
ESTÜ 307	Children Rights and Family Education	2+0	2,0	PSİ 102		Psychology	3+0	3,5

ESTÜ 401	Introduction to Professional Life	1+1	2,0	PZL 302	Marketing Management	3+0	4,5
FEL 102	Introduction to Philosophy	2+0	2,5	REK 242	Sports Aviation	1+2	3,0
FEL 401	Philosophy of Science	2+0	2,5	RUS 255	(Rus.) Russian I	3+0	4,0
FOT 202	Photography	2+0	3,0	RUS 256	(Rus.) Russian II	3+0	4,0
FRA 255	(Fra.) French I	3+0	4,0	SNT 155	History of Art	2+0	2,0
FRA 256	(Fra.) French II	3+0	4,0	SOS 153	Sociology	3+0	3,5
HUK 252	Labor Law	2+0	2,5	SOS 154	Man and Sociology	2+0	3,0
HUK 458	Industrial Rights and Technological Development	3+0	3,0	TAR 201	History of Science	2+0	2,5
İLT 201	Interpersonal Communication	3+0	4,5	THU 203	Community Services	0+2	3,0
İLT 370	New Approaches in Management	3+0	6,5	TİY 121	Introduction to Theatre	2+0	3,0
İLT 419	Body Language and Diction	2+0	5,0	TİY 152	Theatre	2+0	2,5
İSN 309	Mass Media	3+0	3,0	TİY 308	Republic Era Turkish Theatre	2+0	3,0
İŞL 101	Introduction to Business	3+0	4,5	TÜR 120	Turkish Sign Language	3+0	3,0

## SUSTAINABILITY AND CLIMATE CHANGE, MINOR

### I. Semester

Elective Courses

15,0 AKTS

### II. Semester



Compulsory Course 2,5 AKTS

Elective Courses 12,5 AKTS

**Elective Courses**

ÇEV310	Water and Soil Pollution	3+0	3,0
ÇEV316	Air Pollution	3+0	4,5
ÇEV442	Hazardous Waste Management	3+0	4,0
ÇEV477	Remote Sensing and GIS Applications in Environmental Science	2+0	3,0
ÇEV479	Green Engineering Design and Sustainability	2+0	3,0
ÇEV327	Green and Sustainable Agriculture	2+0	3,0
REK117	Recreation and Environment	3+0	5,0
EMİM343	Social Sustainability in Built Environment Design	3+0	4,0
SHU221	Sustainability in Aviation	3+0	6,0
KİM215	Environment Problems	2+0	3,0

**COMPULSORY COURSE**

ÇEV216	Sustainability, Innovation and Project Management in Environmental Engineering	1+1	2,5
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**Elective Courses**

ÇEV214	Environmental Ethics and Engineering Practices	2+0	2,0
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ÇEV346	Environmental Problems Resulting from Energy Production	2+0	3,0
ÇEV495	Air Pollution Meteorology and Atmospheric Dispersion	2+0	3,0
ÇEV356	Reuse of Wastewater for the Sustainability of Water Resources	2+0	3,0
ÇEV362	Environment Economy	2+0	3,0
ÇEV354	Environmental Footprints	2+0	3,0
ÇEV360	Corporate Sustainability Management	2+0	3,0
ÇEV358	Global Climate Change	2+0	3,0
ENM419	Sustainable Systems Engineering	3+0	5,0
KİM341	Green Organic Chemistry	2+0	3,0
İNŞ469	Renewable Energy with Water, Wind and Wave Power	3+0	4,5
FİZ304	Clean Energy Sources	2+0	3,0
EMİM442	Sustainability Assessment in Built Environment	2+2	4,5
ENT457	Sustainable Design Studio	3+0	4,0
EMİM332	Sustainable Design in Architecture	2+2	4,5
MTT404	Textile Sustainability	2+2	4,0

## **DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING (ENGLISH)**

Department of Electrical and Electronics Engineering was first established in 1980 and then became a part of the Faculty of Engineering and Architecture of Anadolu University in 1982. However, when this faculty became a part of the newly established Osmangazi University in August 1993, a new Faculty of Engineering and Architecture and, as a part of this new faculty, a new Department of Electrical and Electronics Engineering were established at Anadolu University. The undergraduate program (leading to the B.S. degree) in our department has started in the 1997-1998 academic year. The language of the instruction in the undergraduate program is English. Department Web Page: <https://eem.eskisehir.edu.tr/>

Department Head : Prof. Dr. Nuray AT  
 Deputy Department Head : Asst. Prof. Dr. Can UYSAL  
 Deputy Department Head : Asst. Prof. Dr. Altan ONAT

## PROGRAM

### I. Semester

BİM 122	(Eng)	Discrete Computational Structures	3+0	5,0
EKİM 105	(Eng)	General Chemistry	4+0	6,0
EMAT 111	(Eng)	Calculus I	4+2	7,5
FİZ 105	(Eng)	Physics I	4+0	6,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5
TÜR 125		Turkish Language I	2+0	2,0
		Elective Courses		2,0

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### III. Semester

BİL 200	(Eng)	Computer Programming	2+2	6,0
EEM 206	(Eng)	Electrical Circuits Laboratory	1+2	3,0
EEM 209	(Eng)	Circuit Analysis I	4+1	7,5
EMAT 211	(Eng)	Differential Equations	3+1	4,5
MAT 293	(Eng)	Engineering Mathematics and Statistics	4+0	7,0
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0

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### II. Semester

EEM 102	(Eng)	Introduction to Electrical Engineering	4+2	7,5
EEM 104	(Eng)	Professional Aspects of Electrical & Electronics Engineering	2+0	3,0
EMAT 112	(Eng)	Calculus II	4+2	7,5
EMAT 221	(Eng)	Linear Algebra	3+1	4,5
FİZ 106	(Eng)	Physics II	4+0	6,0
FİZ 108	(Eng)	Physics Laboratory II	0+2	1,5

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### IV. Semester

EEM 208	(Eng)	Electromagnetic Fields and Waves	4+0	6,0
EEM 210	(Eng)	Fundamentals of Semiconductor Devices	3+0	5,0
EEM 232	(Eng)	Digital Systems I	4+0	6,0
EEM 238	(Eng)	Digital Systems Laboratory	0+2	2,0
İST 244	(Eng)	Engineering Probability	3+0	5,0
TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
TÜR 126		Turkish Language II	2+0	2,0
		Elective Courses		2,0

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**V. Semester**

EEM 301	(Eng)	Signals and Systems	4+0	6,0
EEM 311	(Eng)	Principles of Energy Conversion	3+2	6,0
EEM 321	(Eng)	Electronics I	3+0	5,0
EEM 328	(Eng)	Electronics Laboratory	1+2	3,0
iKT 151	(Eng)	Economics	3+0	3,0
iSG 401		Occupational Health and Safety I	2+0	2,0
		Elective Courses		5,0
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**VII. Semester**

EEM 413	(Eng)	Electrical and Electronics Engineering Design Project I	1+5	4,0
EEM 415	(Eng)	Engineering Design and Research	2+0	3,0
EEMSJ 401	(Eng)	Electrical and Electronics Engineering Internship I	0+2	2,5
		Area Elective Courses		15,0
		Elective Courses		5,5
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**VI. Semester**

EEM 308	(Eng)	Introduction to Communications	3+2	6,5
EEM 336	(Eng)	Microprocessors I	3+2	7,0
EEM 342	(Eng)	Fundamentals of Control Systems	3+2	7,0
iSG 402		Occupational Health and Safety II	2+0	2,0
iŞL 101	(Eng)	Introduction to Business	3+0	4,5
		Elective Courses		3,0
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**VIII. Semester**

EEM 414	(Eng)	Electrical and Electronics Engineering Design Project II	1+5	4,0
EEMSJ 402	(Eng)	Electrical and Electronics Engineering Internship II	0+2	2,5
		Mesleki Seçmeli Dersler		20,0
		Elective Courses		3,5
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## Area Elective Courses

BIM 222	(Eng)	Internet Programming	3+0	4,5	EEM 465	(Eng)	Fundamentals of Data Communications	3+0	5,0
BIM 224	(Eng)	Object-Oriented Programming	3+0	5,5	EEM 466	(Eng)	High Voltage Techniques	3+0	5,0
BIM 312	(Eng)	Database Management Systems	3+0	6,0	EEM 467	(Eng)	Digital Communications	3+0	5,0
BIM 445	(Eng)	Enterprise IT Architecture	2+0	3,0	EEM 468	(Eng)	Advanced Communication Techniques	3+0	5,0
EEM 322	(Eng)	Electronics II	3+0	5,0	EEM 469	(Eng)	Communication Electronics	3+0	5,0
EEM 334	(Eng)	Digital Systems II	3+0	5,0	EEM 470	(Eng)	Microwaves and Antennas	3+0	5,0
EEM 403	(Eng)	Fundamentals of Optoelectronics and Nanophotonics	3+0	5,0	EEM 471	(Eng)	Electrical Machinery I	2+2	5,0
EEM 407	(Eng)	Digital VLSI Design	2+2	5,0	EEM 472	(Eng)	Electrical Machinery II	2+2	5,0
EEM 409	(Eng)	Random Signals	3+0	5,0	EEM 473	(Eng)	Power Systems Analysis I	3+0	5,0
EEM 416	(Eng)	Introduction to GNU/Linux Operating Systems	3+0	5,0	EEM 475	(Eng)	Power Electronics I	3+0	5,0
EEM 417	(Eng)	Engineering Computations	3+1	5,0	EEM 476	(Eng)	Power Electronics II	2+2	5,0
EEM 418	(Eng)	Introduction to Digital Integrated Circuits	3+0	5,0	EEM 477	(Eng)	Digital Signal Processing	3+0	5,0
EEM 444	(Eng)	Object Oriented Design	3+0	5,0	EEM 478	(Eng)	Digital Signal Processing Hardware	1+4	5,0
EEM 446	(Eng)	Cryptographic Hardware Design	3+0	5,0	EEM 479	(Eng)	Electrical Installation Systems	2+2	5,0
EEM 447	(Eng)	Research in Digital Systems I	1+4	5,0	EEM 480	(Eng)	Algorithms and Complexity	3+0	5,0
EEM 448	(Eng)	Research in Digital Systems II	1+4	5,0	EEM 481	(Eng)	Solid State Electronics	3+0	5,0
EEM 449	(Eng)	Embedded System Design	2+2	5,0	EEM 482	(Eng)	Fundamentals of Data Networks	3+0	5,0
EEM 450	(Eng)	Introduction to System Identification	3+0	5,0	EEM 483	(Eng)	Power Systems Analysis II	2+2	5,0

EEM 451	(Eng)	Industrial Control Systems	1+4	5,0	EEM 484	(Eng)	Integrated Circuit Design	3+0	5,0
EEM 452	(Eng)	Introduction to Robotics	3+0	5,0	EEM 485	(Eng)	Digital Electronic Circuits	3+0	5,0
EEM 453	(Eng)	Research in Control and System Theory I	1+4	5,0	EEM 486	(Eng)	Computer Architecture	3+0	5,0
EEM 454	(Eng)	Research in Control and System Theory II	1+4	5,0	EEM 489	(Eng)	Microprocessors II	2+2	5,0
EEM 455	(Eng)	Research in Power Systems I	1+4	5,0	EEM 490	(Eng)	Nonlinear Systems	3+0	5,0
EEM 456	(Eng)	Research in Power Systems II	1+4	5,0	EEM 491	(Eng)	Linear Control Systems	3+0	5,0
EEM 457	(Eng)	Research in Signal Processing I	1+4	5,0	EEM 493	(Eng)	Digital Control Systems	3+0	5,0
EEM 458	(Eng)	Research in Signal Processing II	1+4	5,0	EEM 494	(Eng)	Control Systems Laboratory	1+4	5,0
EEM 459	(Eng)	Research in Electronics I	1+4	5,0	EEM 495	(Eng)	Network Synthesis	3+0	5,0
EEM 460	(Eng)	Research in Electronics II	1+4	5,0	EEM 496	(Eng)	Communications Systems Laboratory	1+4	5,0
EEM 461	(Eng)	Research in Telecommunications I	1+4	5,0	EEM 497	(Eng)	Communication Systems I	3+0	5,0
EEM 462	(Eng)	Research in Telecommunications II	1+4	5,0	EEM 498	(Eng)	Communication Systems II	3+0	5,0
EEM 463	(Eng)	Introduction to Image Processing	3+0	5,0	NÜM 301	(Eng)	Numerical Methods	3+0	3,5
EEM 464	(Eng)	System-on-Chip Design	2+2	5,0					

### Elective Courses

ANT 452		First Aid	1+2	4,0	İSN 409		Organizational Communication	3+0	4,5
ARK 108		Archaeology	2+0	2,0	İSP 151	(Spa.)	Spanish I	4+0	4,0
BEÖ 155		Physical Education	2+0	2,0	İSP 152	(Spa.)	Spanish II	4+0	4,0

BEÖ 176	Trekking	1+2	4,0	işL 102		Management and Organization	3+0	4,0
ESTÜ 101	Introduction to University Life	0+1	2,0	işL 201		Business Organization	3+0	4,0
ESTÜ 102	(Eng) Negotiation Techniques Class	2+0	3,0	işL 209		Business Management	2+0	2,0
ESTÜ 103	Ceramic Design Processes	2+1	3,0	işL 301		Human Resources Management	3+0	4,0
ESTÜ 104	Academic and Life Skills	2+1	3,0	işL 406		Strategic Management	3+0	4,5
ESTÜ 106	Project Management	2+1	3,0	işL 421		Entrepreneurship	2+0	3,0
ESTÜ 111	Volunteering Works	1+2	4,0	işL 454		Management of Technology	3+0	4,5
ESTÜ 112	Cyber Security for Everyone	2+0	2,0	işL 475		Techno Entrepreneurship	3+0	4,0
ESTÜ 113	Design Thinking	3+0	3,0	işL321		Applied Entrepreneurship	3+1	5,0
ESTÜ 114	Visual Thinking	3+0	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 115	Photographic Viewpoint	2+1	3,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 116	Computer Aided Design I	3+0	3,0	JAP301	(Jap.)	Japanese I	4+0	4,0
ESTÜ 117	Computer Aided Design II	3+0	3,0	JAP302	(Jap.)	Japanese II	4+0	4,0
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	KÜL 451		History of Science and Engineering	3+0	4,5
ESTÜ 119	Flute	3+1	3,0	MFALM 101	(Ger)	German for Engineering I	3+0	4,0
ESTÜ 120	Solfège	3+1	3,0	MFALM 102	(Ger)	German for Engineering II	3+0	4,0
ESTÜ 121	Piano	3+1	3,0	MFALM 201	(Ger)	German for Engineering III	3+0	4,0
ESTÜ 122	Guitar	3+1	3,0	MFALM 202	(Ger)	German for Engineering IV	3+0	4,0
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MUH 151		Introduction to Accounting	3+0	4,5
ESTÜ 125	Philosophy of Science	3+0	3,0	MÜH 402		Engineering Ethics	2+0	3,0
ESTÜ 127	Diction	1+2	3,0	MÜH 404		Innovation Management	3+0	3,0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MÜZ 101		Evolution of Music	2+0	3,0
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MÜZ 151		Short History of Music	2+0	3,0
ESTÜ 132	History of Political Thought	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0	2,0
ESTÜ 133	Disability and Awareness	3+0	3,0	ÖMB 322		Ethics of Science and Research	2+0	3,0
ESTÜ 201	Turkish Sign Language	3+0	3,0	PSİ 102		Psychology	3+0	3,5
ESTÜ 203	Introduction to Sociology	3+0	3,0	PSİ 301		Industrial Psychology	3+0	4,5
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0	PZL 302		Marketing Management	3+0	4,5
ESTÜ 206	Financial Literacy	3+0	3,0	REK 242		Sports Aviation	1+2	3,0
ESTÜ 301	Science Communication	2+0	3,0	RTV 281		Digital Literacy	2+2	4,0
ESTÜ 307	Children Rights and Family Education	2+0	2,0	RUS 255	(Rus.)	Russian I	3+0	4,0

ESTÜ 401	Introduction to Professional Life	1+1	2,0	RUS 256	(Rus.) Russian II	3+0	4,0
ESTÜ 402	Coaching and Leadership	3+0	3,0	SAĞ 102	First Aid	2+0	2,5
ESTÜ 403	Basic Computer Utilization	3+0	4,0	SAN 155	Hall Dances	0+2	2,0
ESTÜ 405	Computer Programming	3+0	5,0	SNT 155	History of Art	2+0	2,0
FEL 102	Introduction to Philosophy	2+0	2,5	SOS 153	Sociology	3+0	3,5
FEL 401	Philosophy of Science	2+0	2,5	SOS 154	Man and Sociology	2+0	3,0
FOT 202	Photography	2+0	3,0	SOS 155	Folkdance	2+0	2,0
FRA 255	(Fra.) French I	3+0	4,0	TAR 201	History of Science	2+0	2,5
FRA 256	(Fra.) French II	3+0	4,0	TİY 121	Introduction to Theatre	2+0	3,0
HUK 458	Industrial Rights and Technological Development	3+0	3,0	TİY 152	Theatre	2+0	2,5
İLT 201	Interpersonal Communication	3+0	4,5	TİY 308	Republic Era Turkish Theatre	2+0	3,0
İLT 419	Body Language and Diction	2+0	5,0	THU 203	Community Services	0+2	3,0
İSN 309	Mass Media	3+0	3,0				

## AUTONOMOUS VEHICLES TECHNOLOGY MINOR PROGRAM

### COMPULSORY COURSE GROUP I

MTR 301 Introduction to Mechatronics 3+0 4,5

### COMPULSORY COURSE GROUP II

MLZ 221 Physical Properties of Materials 2+0 2,5

### COMPULSORY COURSE GROUP III

BİM 496 Computer Vision 3+0 4,5

### COMPULSORY COURSE GROUP IV

MEK 216 Engineering Mechanics: Dynamics 3+0 4,0

### TECHNICAL ELECTIVE COURSE GROUP I

BİM 470 Neural Networks 3+0 4,5

### TECHNICAL ELECTIVE COURSE GROUP II



ENM 212 Integer Prog. & Network Models 2+2 6,0

**TECHNICAL ELECTIVE COURSE GROUP III**

EEM 493 Digital Control Systems 3+0 5,0

**TECHNICAL ELECTIVE COURSE GROUP IV**

EEM 452 Introduction to Robotics 3+0 5,0

**TECHNICAL ELECTIVE COURSE GROUP V**

EEM450 Introduction to System Identification 3+0 5,0

**TECHNICAL ELECTIVE COURSE GROUP VI**

ENM 440 Introduction to Data Mining 3+0 4,5

**COMPULSORY COURSE GROUP V**

BIM 309 Artificial Intelligence 3+0 4,5

**COMPULSORY COURSE GROUP VI**

ENM 203 Linear Programming 2+2 5,5

**COMPULSORY COURSE GROUP VII**

BIM 472 Image Processing 3+0 4,5

**COMPULSORY COURSE GROUP VIII**

EEM 463 Introduction to Image Processing 3+0 5,0

**TECHNICAL ELECTIVE COURSE GROUP VII**

MLZ 109 Materials World 2+0 2,5

**TECHNICAL ELECTIVE COURSE GROUP VIII**

MKM 104 Computer Aided Engineering Technical Drawin  
2+2 5,0

**TECHNICAL ELECTIVE COURSE GROUP IX**

IST 356 Programming With Python 4+0 4,5

IST 249 Programming With MATLAB 4+0 4,5

**TECHNICAL ELECTIVE COURSE GROUP GRUBU X**

BIM 493 Mobile Programming-I 3+0 4,5

BİM 494 Mobile Programming-II 3+0 4,5

**TECHNICAL ELECTIVE COURSE GROUP XI**

MEK 323 Fundamentals of Fluid Dynamics 4+0 6,5

**DEPARTMENT OF INDUSTRIAL ENGINEERING (30% ENGLISH)**

Nowadays, technical improvement takes an important role in progressing country. It is important to efficiency use together machine, man and money with ergonomic circumstance. Industrial Engineering aims optimum yield by planning resource and effectiveness. Industrial engineering is concerned with the design, improvement, and installation of integrated systems of people, materials, and equipment; drawing upon specialized knowledge and skill in the mathematics, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict and evaluate the results to be obtained from such systems. Areas like Enterprises Resource Planning, ISO 9001 Quality Management System, feasibility analysis are related to Industrial Engineering. Anadolu University, Industrial Engineering Department was established in 2002. The decisions related with the department are made by the department council which is composed of all faculty members of the department. Students must attend English preparatory class before beginning their four-year Industrial Engineering education. Department Web Page: <https://endustri.eskisehir.edu.tr/>

Department Head : Prof. Dr. Gürkan ÖZTÜRK  
Deputy Department Head : Assoc. Prof. Dr. Mehmet ALEGÖZ  
Deputy Department Head : Asst. Prof. Dr.. Emine Akyol ÖZER

**PROGRAM**

**I. Semester**

ENM 102	(Eng.)	Introduction to Industrial Engineering	2+0	3,0
EKİM 105	(Eng.)	General Chemistry	4+0	6,0
EKİM110	(Eng.)	General Chemistry Laboratory	0+2	1,5
EMAT 111		Calculus I	4+2	7,5
FiZ 105		Physics I	4+0	6,0

**II. Semester**

ENM 104	(Eng.)	Introduction to Computation and Programming for Industrial Engineering	2+2	4,5
EMAT 112		Calculus II	4+2	7,5
EMAT 221	(Eng.)	Linear Algebra	3+1	4,5
FiZ 106		Physics II	4+0	6,0
FiZ 108		Physics Laboratory II	0+2	1,5

FİZ 107	Physics Laboratory I	0+2	1,5	İKT 151	Economics	3+0	3,0
TRS 127	Technical Drawing	2+2	4,5				
			30		Elective Courses		3,0
							30

### III. Semester

BIY 243	(Eng) General and Molecular Biology	3+0	4,0
EMAT211	Differential Equation	3+1	4,5
ENM 203	(Eng) Linear Programming	2+2	5,5
ENM 207	(Eng) Advanced Programming	2+2	4,5
MEK 215	(Eng) Statics and Strength of Materials	3+0	4,5
MUH 210	General and Cost Accounting	3+0	3,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
TÜR 125	Turkish Language I	2+0	2,0
			30

### IV. Semester

ENM 212	(Eng) Integer Programming and Network Models	2+2	6,0
ENM 214	Üretim Yöntemleri ve Malzeme Seçimi	3+2	5,0
ENM 407	(Eng) System Analysis	3+0	5,0
İSG 401	Occupational Health and Safety I	2+0	2,0
İST 244	Engineering Probability	3+0	5,0
İŞL 116	(Eng) Fundamentals of Business	3+0	3,0
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
TÜR 126	Turkish Language II	2+0	2,0
			30

### V. Semester

BİL 409	(Eng) Decision Support Systems	3+0	6,0
ENM 301	Work Study	3+0	4,0
ENM 317	Engineering Statistics	3+0	4,5
ENM 319	(Eng) Production and Operations Planning I	3+0	5,0

### VI. Semester

ENM 307	(Eng) Simulation	2+2	6,0
ENM 310	Experiment Design and Regression Analysis	3+0	4,5
ENM 320	(İng.) Production and Operations Planning II	3+0	5,0
ENM 426	Ergonomics	3+0	4,5

iKT 356	(Eng)	Engineering Economics	3+0	4,5	iSG 402	Occupational Health and Safety II	2+0	2,0
		Elective Courses		2,0		Area Elective Courses		8,0
		Area Elective Courses		4,0				
				<u>30</u>				<u>30</u>

**VII. Semester**

ENM 427		Special Topics in Industrial Engineering	1+2	4,5
ENM 435		Mühendislik Seminerleri I	0+2	1,0
ENMSJ 401		Industrial Engineering Internship I	0+2	2,5
HUK 252		Labor Law	2+0	2,5
TKY 302		Quality Control	3+0	4,5
		Elective Courses		3,0
		Area Elective Courses		12
				<u>30</u>

**VIII. Semester**

ENM 428		Industrial Engineering Applications	2+4	5,5
ENMSJ 402		Industrial Engineering Internship II	0+2	2,5
		Area Elective Courses		22
				<u>30</u>

## Area Elective Courses

ARY 202		Research Techniques	3+0	5,0	ENM 437	(Eng)	Structural Equation Modeling	3+0	4,5
BİM 211	(Eng)	Visual Programming	2+2	6,0	ENM 440	(Eng)	Introduction to Data Mining	3+0	4,5
BİM 213	(Eng)	Data Structures and Algorithms	2+2	5,5	ENM 442	(Eng)	Decision Analysis	3+0	4,5
BİM 222	(Eng)	Internet Programming	3+0	4,5	ENM 444		Supply Chain Modeling And Analysis	3+0	4,5
BİM 312	(Eng)	Database Management Systems	3+0	6,0	ENM 446		Enterprise Resource Planning	3+0	4,5
BİM 445	(Eng)	Enterprise IT Architecture	2+0	3,0	ENM 448	(Eng)	Project Planning and Management	3+0	6,0
BİM 466	(Eng)	Fuzzy Logic	3+0	4,5	ENM 450	(Eng)	Introduction to Metaheuristic Optimization	3+0	6,0
BİM 470	(Eng)	Neural Networks	3+0	4,5	ENM 452	(Eng)	Introduction to Multiobjective Optimization	3+0	5,0
BİM 478	(Eng)	Management Information Systems	3+0	4,5	ENM 454		Risk Assessment and Hazard Analysis Techniques	3+0	4,5
EEM 480	(Eng)	Algorithms and Complexity	3+0	5,0	FİN 415	(Eng)	Financial Markets and Institutions	3+0	4,5
ENM 304	(Eng)	Investment Planning and Analysis	4+0	6,0	İŞL 301		Human Resources Management	3+0	4,0
ENM 306	(Eng)	Stochastic Models	3+0	4,5	İŞL 323	(Eng)	Human Resources Management	3+0	5,0
ENM 309		Industrial Information Systems	3+0	6,0	İŞL 412		Strategic Management	2+0	3,0
ENM 312		Manufacturing Systems Analysis	3+0	5,0	İŞL 454		Management of Technology	3+0	4,5
ENM 313		Mathematical Programming Models in Engineering	3+0	4,5	İŞL 475		Techno-Entrepreneurship	3+0	4,0
ENM314	(Eng)	Investment Analysis	3+0	5,0					
ENM 315	(Eng)	Nonlinear Programming	2+2	6,0	İŞL 454	(Eng)	Management of Technology	3+0	4,5
ENM316	(Eng)	Statistical Forecasting and Time Series	3+0	5,0	İST 237		Programming With MATLAB	4+0	4,0
ENM321		Industrial Case Studies	3+0	5,0	İST 401		Multivariate Statistics I	3+0	4,5
ENM323	(Eng)	Energy Systems Planning	3+0	5,0	İST 402		Multivariate Statistics II	3+0	4,0
ENM 325	(Eng)	Theory and Algorithms in Nonlinear Programming	3+0	5,0	İST 411	(Eng)	Time Series Analysis	4+0	5,0
ENM 411		Facility Planning	3+0	4,5	İST 411		Time Series Analysis	4+0	5,0
ENM 411	(Eng)	Facilities Planning	3+0	4,5	İST 415		Reliability Analysis	3+0	5,0
ENM 413		Planning and Scheduling in Manufacturing and Service Systems	3+0	4,0	LOJ 401		Logistics Management and Models	3+0	6,0
ENM 413	(Eng)	Planning and Scheduling in Manufacturing and Service Systems	3+0	4,0	LOJ 401	(Eng)	Logistics Management and Models	3+0	6,0
ENM 415		Design, Creativity and Innovation	3+0	4,5	MAT 226		Introduction to Graph Theory	3+0	5,0

ENM 419	(Eng)	Sustainable Systems Engineering	3+0	5,0	MAT 410		Game Theory	3+0	5,0
ENM 420		Service Systems	3+0	4,5	MÜH 302		Interdisciplinary Applications	1+2	4,5
ENM 421		Introduction to Data Science	2+1	4,5	MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5
ENM 423	(Eng)	Queuing Models	3+0	5,0	PZL 302		Marketing Management	3+0	4,5
ENM 425	(Eng)	Scheduling	3+0	5,0	PZL 310	(Eng)	Marketing Management	3+0	5,0
ENM 430		Cognitive Ergonomics	3+0	4,5	PZL 452	(Eng)	Revenue Management and Pricing	3+0	6,0
ENM 431		Advanced Production Systems	3+0	4,5	TKY 405		Total Quality Management	3+0	4,5
ENM 432		Lean Thinking and Lean Manufacturing Management	3+0	4,5					

### Elective Courses

ANT 452		First Aid	1+2	4,0	FRA 256	(Fra)	French II	3+0	4,0
ARK 108		Archaeology	2+0	2,0	İLT 201		Interpersonal Communication	3+0	4,5
BEÖ 155		Physical Education	2+0	2,0	İLT 419		Body Language and Diction	2+0	5,0
BEÖ 176		Trekking	1+2	4,0	İŞL 101		Introduction to Business	3+0	4,5
ESTÜ 101		Introduction to University Life	0+1	2,0	İŞL 102		Management and Organization	3+0	4,0
ESTÜ 102	(Eng)	Negotiation Techniques Class	2+0	3,0	İŞL 209		Business Management	2+0	2,0
ESTÜ 103		Ceramic Design Processes	2+1	3,0	İŞL 321		Applied Entrepreneurship	3+1	5,0
ESTÜ 104		Academic and Life Skills	2+1	3,0	İŞL 406		Strategic Management	3+0	4,5
ESTÜ 106		Project Management	2+1	3,0	İŞL 421		Entrepreneurship	2+0	3,0
ESTÜ 111		Volunteering Works	1+2	4,0	İSN 409		Organizational Communication	3+0	4,5
ESTÜ 112		Cyber Security for Everyone	2+0	2,0	İSP 151	(Spa.)	Spanish I	4+0	4,0
ESTÜ 113		Design Thinking	3+0	3,0	İSP 152	(Spa.)	Spanish II	4+0	4,0
ESTÜ 114		Visual Thinking	3+0	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 115		Photographic Viewpoint	2+1	3,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 116		Computer Aided Design I	3+0	3,0	JAP 301	(Jap.)	Japanese I	4+0	4,0
ESTÜ 117		Computer Aided Design II	3+0	3,0	JAP 302	(Jap.)	Japanese II	4+0	4,0
ESTÜ 118		Visual Thinking with	3+0	3,0	MFALM	(Ger.)	German for Engineering I	3+0	4,0

	Concepts			101			
ESTÜ 119	Flute	3+1	3,0	MFALM 102	(Ger.)	German for Engineering II	3+0 4,0
ESTÜ 120	Solfege	3+1	3,0	MFALM 201	(Ger.)	German for Engineering III	3+0 4,0
ESTÜ 121	Piano	3+1	3,0	MFALM 202	(Ger.)	German for Engineering IV	3+0 4,0
ESTÜ 122	Guitar	3+1	3,0	MUH 151		Introduction to Accounting	3+0 4,5
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MÜH 402		Engineering Ethics	2+0 3,0
ESTÜ 125	Philosophy of Science	3+0	3,0	MÜH 404		Innovation Management	3+0 3,0
ESTÜ 127	Diction	1+2	3,0	MÜZ 151		Short History of Music	2+0 3,0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MÜZ 155		Turkish Folk Music	2+0 2,0
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MÜZ 157		Traditional Turkish Art Music	2+0 2,0
ESTÜ 132	History of Political Thought	3+0	3,0	ÖMB 322		Ethics of Science and Research	2+0 3,0
ESTÜ 133	Disability and Awareness	3+0	3,0	PSİ 102		Psychology	3+0 3,5
ESTÜ 201	Turkish Sign Language	3+0	3,0	REK 242		Sports Aviation	1+2 3,0
ESTÜ 203	Introduction to Sociology	3+0	3,0	RTV 281		Digital Literacy	2+2 4,0
				RUS255	(Rus.)	Russian I	3+0 4,0
ESTÜ 206	Financial Literacy	3+0	3,0	RUS 256	(Rus.)	Russian II	3+0 4,0
ESTÜ 301	Science Communication	2+0	3,0	SAĞ 102		First Aid	2+0 2,5
ESTÜ 307	Children Rights and Family Education	2+0	2,0	SAN 155		Hall Dances	0+2 2,0
ESTÜ 401	Introduction to Professional Life	1+1	2,0	SNT 155		History of Art	2+0 2,0
ESTÜ 402	Coaching and Leadership	3+0	3,0	SOS 155		Folkdance	2+0 2,0
ESTÜ 403	Basic Computer Utilization	3+0	4,0	THU 203		Community Services	0+2 3,0
ESTÜ 405	Computer Programming	3+0	5,0	TİY 121		Introduction to Theatre	2+0 3,0
FOT 202	Photography	2+0	3,0	TİY 152		Theatre	2+0 2,5
FRA 255 (Fra)	French I	3+0	4,0	TİY 308		Republic Era Turkish Theatre	2+0 3,0
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0				

## ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING MINOR PROGRAM

### COMPULSORY COURSE GROUP I

BİM309	Artificial Intelligence	3+0	4,5
BİM470	Neural Networks	3+0	4,5
BİM453	Introduction to Machine Learning	3+0	4,5

ENM440	Introduction to Data Mining	3+0	4,5
<b>COMPULSORY COURSE GROUP II</b>			
ENM207	Advanced Programming	2+2	4,5
<b>COMPULSORY COURSE GROUP III</b>			
ENM104	Introduction to Computation and Program. for Industrial Eng	2+2	4,5
<b>COMPULSORY COURSE GROUP IV</b>			
İST252	Probability and Statistics	3+0	4,0
<b>TECHNICAL ELECTIVE COURSE GROUP I</b>			
BİM312	Database Management Systems	3+0	6,0
<b>TECHNICAL ELECTIVE COURSE GROUP II</b>			
ENM310	Experiment Design and Regression Analysis	3+0	4,5
<b>TECHNICAL ELECTIVE COURSE GROUP III</b>			
EEM463	Introduction to Image Processing	3+0	5,0
BİM496	Computer Vision	3+0	5,0
BİM488	Introduction to Pattern Recognition	3+0	4,5
İST411	Time Series Analysis	4+0	5,0
ENM450	Introduction to Metaheuristic Optimization	3+0	6,0
ENM421	Introduction to Data Science	2+1	4,5

## DEPARTMENT OF CIVIL ENGINEERING (30% ENGLISH)

Civil Engineers from history left us the Maya and Egyptian Pyramids, the Gothic Cathedrals, the Great Wall of China, and quite literally, the physical as well as the technological foundation upon which many of our modern structure are built. The scope of the construction industry today is immense: from suburban homes to 100 story skyscraper, from sidewalk to dams and tunnels for irrigation and hydroelectric power; from recreational marinas to complete harbors and even structures in the deep open sea; from bicycle shops to aircrafts factories; from smart houses to bridges; thermal power plants, petroleum refineries, and mining developments; highways and rapid train systems that not only span physical spaces, but bring people together in the social, political and economic endovers. The Department was established in 1998 as Civil Engineering Department. The decisions related with the department are made by the department council which is composed of all faculty members of the department. The department is governed by one chairman and two deputy chairmen. One of the deputy chairmen takes care of technical activities of the department while the other deputy chairman assists chairman in academic activities in the department. Department Web Page: <https://insaat.eskisehir.edu.tr/>

Department Head : Prof. Dr. Aynur ŞENSOY ŞORMAN  
Deputy Department Head : Asst. Prof. Dr. Onur TUNABOYU  
Deputy Department Head : Assoc. Prof. Dr. Ali BOZER

### PROGRAM

I.Semester			II. Semester		
EKİM105	General Chemistry	4+0 6,0	EMAT112	Calculus II	4+2 7,5
EKİM110	General Chemistry Laboratory	0+2 1,5	FİZ 106 (Eng)	Physics II	4+0 6,0
EMAT111	Calculus I	4+2 7,5	FİZ 108 (Eng)	Physics Laboratory II	0+2 1,5



FİZ 105	(Eng)	Physics I	4+0	6,0	İNG 360	(Eng)	English for Business	2+0	2,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5	İNŞ 118		Computer Applications in Civil Engineering	2+2	4,5
İNG 250	(Eng)	Reading and Speaking in English	2+0	2,0	TRS 110		Technical Drawing in Civil Engineering	2+2	4,5
İNŞ 101		Introduction to Civil Engineering	2+0	3,5	TÜR 126		Turkish Language II	2+0	2,0
TÜR 125		Turkish Language I	2+0	2,0			Seçmeli Dersler		2,0
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30,0									30,0

### III. Semester

EİST 201	(Eng)	Engineering Statistics	3+0	4,0	İKT 356	(Eng)	Engineering Economics	3+0	4,5
EMAT211		Differential Equation	3+1	4,5	İNŞ 240	(Eng)	Hydrology	3+0	4,5
EMAT223		Linear Algebra and Numerical Methods	2+2	4,5	İNŞ 246	(Eng)	Computer Programming in Civil Engineering	1+2	3,5
İNŞ 239		Law and Ethics in Civil Engineering	3+0	3,0	MEK 206	(Eng)	Dynamics	3+0	4,5
İNŞ 241	(Eng)	Materials Science in Civil Engineering	3+0	4,5	MEK 212	(Eng)	Strength of Materials I	3+2	6,0
MEK 201	(Eng)	Statics	3+0	4,5	MLZ 204		Materials of Construction	3+2	5,0
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	TAR 166		Atatürk's Principles and History of Turkish Revolution I II	2+0	2,0
		Seçmeli Dersler		3,0					
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30,0									30,0

### V. Semester

İNŞ 307	(Eng)	Structural Analysis I	3+2	6,0	İNŞ 302		Reinforced Concrete I	3+2	6,0
İNŞ 311		Transportation Engineering I	3+2	6,0	İNŞ 312	(Eng)	Construction Engineering and Management	3+0	4,5
İNŞ 315	(Eng)	Soil Mechanics I	3+0	4,5	İNŞ 320		Steel Structures	3+0	4,5
İNŞ 317	(Eng)	Soil Mechanics Laboratory	0+2	1,5	İNŞ 322	(Eng)	Hydraulics	3+2	6,0
MEK 307	(Eng)	Fluid Mechanics	3+0	4,5	İNŞ 342		Foundation Engineering I	3+0	4,5
İSG 401		Occupational Health and Safety I	2+0	2,0	İNŞS302		Civil Engineering Internship II	0+2	2,5
İNŞS301		Civil Engineering Internship I	0+2	2,5	İSG 402		Occupational Health and Safety II	2+0	2,0

### VI. Semester

Seğmeli Dersler 3,0

30,0

30,0

**VII. Semester**

**VIII. Semester**

İNŞ 415	Special Topics in Civil Engineering	2+2	3,5	İNŞ 414	Applications of Design in Civil Engineering	2+4	4,5
İNŞ 417	Design Project	2+2	4,0		Area Elective Courses		22,5
	Area Elective Courses		22,5		Elective Courses		3,0
			30,0				30,0

**Area Elective Courses**

İNŞ 310	Water Supply and Sewerage	3+2	4,5	İNŞ 471	(Eng) Numerical Modeling in Hydrology and Hydraulics	2+2	4,5
İNŞ 314	(Eng) Structural Analysis II	3+0	4,5	İNŞ 472	Introduction to Traffic	3+0	4,5
İNŞ 401	Reinforced Concrete Project	3+0	4,5	İNŞ 473	Timber Structures	3+0	4,5
İNŞ 407	Reinforced Concrete II	3+0	4,5	İNŞ 474	Tunnels	3+0	4,5
İNŞ 409	Pavement Design	3+0	4,5	İNŞ 475	Multi-Story Steel Structure Design	3+0	4,5
İNŞ 411	Transportation Engineering II	3+0	4,5	İNŞ 476	Project Planning with Primavera and MS Project	3+0	4,5
İNŞ 451	(Eng) Geographic Information Systems (GIS) Applications in Hydrology and Hydraulics	2+2	4,5	İNŞ 478	Construction Cost Analysis and Estimating	3+0	4,5
İNŞ 452	(Eng) Computer Applications in Hydrology and Hydraulics	2+2	4,5	İNŞ 480	Concrete Making Materials	3+0	4,5
İNŞ 453	Railway Engineering	3+0	4,5	İNŞ 481	Soil Mechanics II	3+0	4,5
İNŞ 454	Earthquake Analysis of Structures	3+0	4,5	İNŞ 482	Ground Improvement	3+0	4,5
İNŞ 455	Highway Design	2+2	4,5	İNŞ 483	Retaining Structures	3+0	4,5
İNŞ 456	Ground Water Hydrology	3+0	4,5	İNŞ 484	Foundation Engineering II	3+0	4,5
İNŞ 457	Construction Cost Design	2+2	4,5	İNŞ 485	Irrigation and Drainage	3+0	4,5
İNŞ 458	Testing of Concrete	3+0	4,5	İNŞ 486	Introduction to Soil Dynamics	3+0	4,5
İNŞ 459	Geotechnical Design	2+2	4,5	İNŞ 487	Water Structures	3+0	4,5

İNŞ 460		Admixture for Concrete	3+0	4,5	İNŞ 488		Environmental Geotechnology	3+0	4,5
İNŞ 461		Structural Design for Reinforced Concrete Buildings	2+2	4,5	İNŞ 489	(Eng)	Open Channel Hydraulics	3+0	4,5
İNŞ 462		Properties of Fresh and Hardened Concrete	3+0	4,5	İNŞ 490		Coastal and Port Engineering	3+0	4,5
İNŞ 463		Hydraulic Design	2+2	4,5	İNŞ 492	(Eng)	Water Resources Engineering	3+0	4,5
İNŞ 464		Concrete Durability	3+0	4,5	İNŞ 494		Civil Engineering Construction	3+0	4,5
İNŞ 465		Steel Structural Design	2+2	4,5	İNŞ 495		Highway Pavements	3+0	4,5
İNŞ 466	(Eng)	Steel Structure Project	3+0	4,5	İNŞ 496	(Eng)	Construction Planning and Management	3+0	4,5
İNŞ 467	(Eng)	Construction Equipments	3+0	4,5	İNŞ 498	(Eng)	Introduction to Structural Dynamics	3+0	4,5
İNŞ 468		Computer-Based Project Management	3+0	4,5	JEO 201		Engineering Geology	3+0	4,5
İNŞ 469	(Eng)	Renewable Energy with Water, Wind and Wave Power	3+0	4,5	MEK 403	(Eng)	Strength of Materials II	3+0	4,5
İNŞ 470		Concrete Technology	3+0	4,5	MÜH 302		Interdisciplinary Applications	1+2	4,5
					TOP 102		Surveying	2+2	4,5

### Elective Courses

ANT 452		First Aid	1+2	4,0	İLT 201		Interpersonal Communication	3+0	5,0
ARK 108		Archaeology	2+0	2,0	İLT 419		Body Language and Diction	2+0	5,0
BEÖ 155		Physical Education	2+0	2,0	İSN 309		Mass Media	3+0	3,0
BEÖ 176		Trekking	1+2	4,0	İSN 409		Organizational Communication	3+0	4,5
ESTÜ 101		Introduction to University Life	0+1	2,0	İSP 151	(Spa.)	Spanish I	4+0	4,0
ESTÜ 102	(Eng)	Negotiation Techniques	2+0	3,0	İSP 152	(Spa.)	Spanish II	4+0	4,0
ESTÜ 103		Ceramic Design Processes	2+1	3,0	İŞL 101	(Eng)	Introduction to Business	3+0	4,5
ESTÜ 104		Academic and Life Skills	2+1	3,0	İŞL 101		Introduction to Business	3+0	5,0
ESTÜ 106		Project Management	2+1	3,0	İŞL 102		Management and Organization	3+0	4,0
ESTÜ 111		Volunteering Works	1+2	4,0	İŞL 209		Business Management	2+0	2,0
ESTÜ 112		Cyber Security for Everyone	2+0	2,0	İŞL 301		Human Resources Management	3+0	4,0

ESTÜ 113	Design Thinking	3+0	2,0	İŞL 321		Applied Entrepreneurship	3+1	5,0
ESTÜ 114	Visual Thinking	3+0	3,0	İŞL 406		Strategic Management	3+0	4,5
ESTÜ 115	Photographic Viewpoint	2+1	3,0	İŞL 421		Entrepreneurship	2+0	3,0
ESTÜ 116	Computer Aided Design I	3+0	3,0	İŞL 454	(Eng)	Management of Technology	3+0	4,5
ESTÜ 117	Computer Aided Design II	3+0	3,0	İŞL 475		Techno-Entrepreneurship	3+0	4,0
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 119	Flute	3+1	3,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 120	Solfege	3+1	3,0	JAP301	(Jap.)	Japanese I	4+0	4,0
ESTÜ 121	Piano	3+1	3,0	JAP302	(Jap.)	Japanese II	4+0	4,0
ESTÜ 122	Guitar	3+1	3,0	KÜL 451	(Eng)	History of Science and Engineering	3+0	4,5
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MFALM 101	(Ger.)	German for Engineering I	3+0	4,0
ESTÜ 125	Philosophy of Science	3+0	3,0	MFALM 102	(Ger.)	German for Engineering II	3+0	4,0
ESTÜ 127	Diction	1+2	3,0	MFALM 201	(Ger.)	German for Engineering III	3+0	4,0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MFALM 202	(Ger.)	German for Engineering IV	3+0	4,0
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MUH 151		Introduction to Accounting	3+0	4,5
ESTÜ 133	Disability and Awareness	3+0	3,0	MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
ESTÜ 201	Turkish Sign Language	3+0	3,0	MÜH 404	(Eng)	Innovation Management	3+0	3,0
ESTÜ 203	Introduction to Sociology	3+0	3,0	MÜZ 101		Evolution of Music	2+0	3,0
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0	MÜZ 151		Short History of Music	2+0	3,0
ESTÜ 206	Financial Literacy	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0	2,0
ESTÜ 301	Science Communication	2+0	3,0	ÖMB 322		Ethics of Science and Research	2+0	3,0
ESTÜ 307	Children Rights and Family Education	2+0	2,0	PSİ 102		Psychology	3+0	3,5
ESTÜ 401	Introduction to Professional Life	1+1	2,0	REK 242		Sports Aviation	1+2	3,0
ESTÜ 402	Coaching and Leadership	3+0	5,0	RTV 281		Digital Literacy	2+2	4,0
ESTÜ 403	Basic Computer Utilization	3+0	4,0	RUS 255	(Rus.)	Russian I	3+0	4,0

ESTÜ 405		Computer Programming	3+0	5,0	RUS 256	(Rus.)	Russian II	3+0	4,0
ESTÜ132		History of Political Thought	3+0	3,0	SAĞ 102		First Aid	2+0	2,5
FOT 202		Photography	2+0	3,0	SNT 155		History of Art	2+0	2,0
FRA 255	(Fra.)	French I	3+0	4,0	SOS 154		Man and Sociology	2+0	3,0
FRA 256	(Fra.)	French II	3+0	4,0	THU 203		Community Services	0+2	3,0
HUK 252		Labor Law	2+0	2,5	TİY 121		Introduction to Theatre	2+0	3,0
HUK 458		Industrial Rights and Technological Development	3+0	3,0	TİY 152		Theatre	2+0	2,5
İKT 151	(Eng)	Economics	3+0	3,0	TİY 308		Republic Era Turkish Theatre	2+0	3,0
İLT 201	(Eng)	Interpersonal Communication	3+0	4,5					

## DEPARTMENT OF CHEMICAL ENGINEERING (30% ENGLISH)

Chemical Engineering involves in the design, construction and operation of processes which convert raw materials into useful products by changing their chemical or physical state. The discipline of chemical engineering has its origins in oil refining and petrochemical production, moreover the skills of a chemical engineer are now applied in a wide range of other industries, such as food and baverage, pharmaceuticals, paper, plastics, water purification, electricity generation, metals, textiles, fertelizer, cement, semi-conductors, perfumes and fragrances, cosmetics and detergents,paint,fertilizer and cement. The department was established in 1968. The department transferred to Eskisehir Osmangazi Universty with the partition of Anadolu Universty in 1993 and after 4 years break,it restarted education again at Anadolu Universty Iki Eylul Campus in 1997. % 30 of education language is English. Department Web Page: <https://kimya.eskisehir.edu.tr/>

Department Head : Prof. Dr. Nezihe AYAS  
Deputy Department Head : Assoc. Prof. Dr. Sema AKYALÇIN  
Deputy Department Head : Asst. Prof. Dr. Elif KAYNAK URAZ

### PROGRAM

#### I. Semester

#### II. Semester

EKİM101	(Eng)	General Chemistry I	4+0	6,0	EKİM102	(Eng)	General Chemistry II	4+0	6,0
EMAT111		Calculus I	4+2	7,5	EKİM110	(Eng)	General Chemistry Laboratory	0+2	1,5
FİZ 105		Physics I	4+0	6,0	EMAT112		Calculus II	4+2	7,5
FİZ 107		Physics Laboratory I	0+2	1,5	FİZ 106		Physics II	4+0	6,0
KMH 105	(Eng)	Technical English	2+0	2,5	FİZ 108		Physics Laboratory II	0+2	1,5

TRS 127	Technical Drawing	2+2	4,5	KMH 108	(Eng)	Introduction to Chemical Engineering	2+0	3,0
TÜR 125	Turkish Language I	2+0	2,0	TÜR 126		Turkish Language II	2+0	2,0
						Elective Courses		2,5
			30,0				30,0	
<b>III. Semester</b>				<b>IV. Semester</b>				
EMAT211	Differential Equation	3+1	4,5	BİL 813	(Eng)	Computer Programming in Engineering	2+2	4,0
İKT 151	Economics	3+0	3,0	EİST 201		Engineering Statistics	3+0	4,0
KİM 208	Organic Chemistry	3+0	4,0	EMAT223		Linear Algebra and Numerical Methods	2+2	4,5
KİM 211	Analytical Chemistry	3+0	3,0	KİM 226		Physical Chemistry	3+0	4,0
KİM 230	Analytical Chemistry Laboratory	0+3	2,0	KİM 231		Physical Chemistry Laboratory	0+3	2,0
KMH 213	(Eng) Chemical Process Calculations	3+2	6,0	MEK 317		Fluid Mechanics	4+0	5,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
	Area Elective Courses		3,5			Area Elective Courses		4,5
	Elective Courses		2,0					
			30,0				30,0	
<b>V. Semester</b>				<b>VI. Semester</b>				
İKT 356	(Eng) Engineering Economics	3+0	4,5	İSG 401		Occupational Health and Safety I	2+0	2,0
KİMSJ301	Chemical Engineering Laboratory Internship	0+2	2,5	KMH 303	(Eng)	Mathematical Modelling in Chemical Engineering	4+0	5,0
KMH 310	Heat Transfer	4+0	5,0	KMH 308		Mass Transfer	4+0	5,0
KMH 317	Chemical Engineering Thermodynamics I	3+0	4,5	KMH 314	(Eng)	Chemical Reaction Engineering I	4+0	5,0
MLZ 203	Materials Science	3+0	3,5	KMH 318		Chemical Engineering Thermodynamics II	3+0	4,5
	Area Elective Courses		8,0			Area Elective Courses		6,5
	Elective Courses		2,0			Elective Courses		2,0
			30,0				30,0	
<b>VII. Semester</b>				<b>VIII. Semester</b>				
KMH 415	Process Dynamics and Control	4+0	5,0	KMH 434		Chemical Engineering Applications	2+4	6,0
KMH 429	Special Topics in Chemical Engineering	1+2	3,0	KMH 436	(Eng)	Chemical Engineering Laboratory II	0+4	4,0
KMH 435	(Eng) Chemical Engineering Laboratory I	0+4	4,0	KMH 432	(Eng)	Chemical Engineering Design II	4+0	6,0
KMH 431	(Eng) Chemical Engineering Design I	4+0	6,0	KMH 406	(Eng)	Separation Processes	3+0	5,0



ESTÜ 102	(Eng)	Negotiation Techniques Class	2+0	3,0	İSN 309	Mass Media	3+0	3,0
ESTÜ 103		Ceramic Design Processes	2+1	3,0	İSN 409	Organizational Communication	3+0	4,5
ESTÜ 104		Academic and Life Skills	2+1	3,0	İSP 151	(Spa.) Spanish I	4+0	4,0
ESTÜ 105		Big Data Analysis with SQL	2+2	4,5	İSP 152	(Spa.) Spanish II	4+0	4,0
ESTÜ 106		Project Management	2+1	3,0	İŞL 101	Introduction to Business	3+0	4,5
ESTÜ 111		Volunteering Works	1+2	4,0	İŞL 101	(Eng) Introduction to Business	3+0	4,5
ESTÜ 112		Cyber Security for Everyone	2+0	2,0	İŞL 201	(Eng) Business Organization	3+0	4,0
ESTÜ 113		Design Thinking	3+0	3,0	İŞL 301	Human Resources Management	3+0	4,0
ESTÜ 114		Visual Thinking	3+0	3,0	İŞL 321	Applied Entrepreneurship	3+1	5,0
ESTÜ 115		Photographic Viewpoint	2+1	3,0	İŞL 454	(Eng) Management of Technology	3+0	4,5
ESTÜ 116		Computer Aided Design I	3+0	3,0	İŞL 475	Techno-Entrepreneurship	3+0	4,0
ESTÜ 117		Computer Aided Design II	3+0	3,0	İTA 255	(İta.) Italian I	3+0	4,0
ESTÜ 118		Visual Thinking with Concepts	3+0	3,0	İTA 256	(İta.) Italian II	3+0	4,0
ESTÜ 119		Flute	3+1	3,0	JAP301	(Jap.) Japanese I	4+0	4,0
ESTÜ 120		Solfège	3+1	3,0	JAP302	(Jap.) Japanese II	4+0	4,0
ESTÜ 121		Piano	3+1	3,0	KÜL 451	(Eng) History of Science and Engineering	3+0	4,5
ESTÜ 122		Guitar	3+1	3,0	MFALM101	(Ger) German for Engineering I	3+0	4,0
ESTÜ 123		Gender Equality in Work Life	2+0	3,0	MFALM102	(Ger) German for Engineering II	3+0	4,0
ESTÜ 125		Philosophy of Science	3+0	3,0	MFALM201	(Ger) German for Engineering III	3+0	4,0
ESTÜ 127		Diction	1+2	3,0	MFALM202	(Ger) German for Engineering IV	3+0	4,0
ESTÜ 129		Turkish as a Foreign Language I	2+0	2,0	MÜH 404	(Eng) Innovation Management	3+0	3,0
ESTÜ 130		Turkish as a Foreign Language II	2+0	2,0	MÜH 402	(Eng) Engineering Ethics	2+0	3,0
ESTÜ 132		History of Political Thought	3+0	3,0	MÜZ 151	Short History of Music	2+0	3,0
ESTÜ 133		Disability and Awareness	3+0	3,0	MÜZ 157	Traditional Turkish Art Music	2+0	2,0
ESTÜ 201		Turkish Sign Language	3+0	3,0	PSİ 102	Psychology	3+0	3,5
ESTÜ 203		Introduction to Sociology	3+0	3,0	PZL 211	(Eng) Principles of Marketing	3+0	5,0
ESTÜ 204		Effective Reading and Writing Skills	3+0	4,0	PZL 302	Marketing Management	3+0	4,5
ESTÜ 301		Science Communication	2+0	3,0	RTV 281	Digital Literacy	2+2	4,0
ESTÜ 307		Children Rights and Family Education	2+0	2,0	RUS 255	(Rus.) Russian I	3+0	4,0
ESTÜ 401		Introduction to Professional Life	1+1	2,0	RUS 256	(Rus.) Russian II	3+0	4,0
ESTÜ 402		Coaching and Leadership	3+0	5,0	SAĞ 102	First Aid	2+0	2,5
ESTÜ 403		Basic Computer Utilization	3+0	4,0	SNT 155	History of Art	2+0	2,0
ESTÜ 405		Computer Programming	3+0	5,0	SOS 154	Man and Sociology	2+0	3,0
FOT 202		Photography	2+0	3,0	THU 203	Community Services	0+2	3,0
FRA 255	(Fra.)	French I	3+0	4,0	TİY 121	Introduction to Theatre	2+0	3,0
FRA 256	(Fra.)	French II	3+0	4,0	TİY 308	Republic Era Turkish Theatre	2+0	3,0
HUK 252		Labor Law	2+0	2,5	TİY 152	Theatre	2+0	2,5

## SUSTAINABLE CLEAN ENERGY MINOR PROGRAM

### COMPULSORY COURSE



YKMH301 Green Hydrogen Production And Applications 3+0 5,5

**TECHNICAL ELECTIVE COURSE GROUP I**

MKM421 Energy Management and Efficiency 3+0 7,0

**TECHNICAL ELECTIVE COURSE GROUP II**

KMH310 Heat Transfer 4+0 5,0

**TECHNICAL ELECTIVE COURSE GROUP III**

KMH 317 Chemical Engineering Thermodynamics I 3+0 4,5

**TECHNICAL ELECTIVE COURSE GROUP IV**

EEM311 Principles of Energy Conversion 3+2 7,0

EEM102 Introduction to Electrical Engineering 4+2 7,5

**TECHNICAL ELECTIVE COURSE GROUP V**

ÇEV461 Green Engineering Design and Sustainability 3+0 4,5

ENM419 Sustainable Systems Engineering 3+0 5,0

EEM473 Power System Analysis I 3+0 5,0

EEM471 Electrical Machines I 2+2 5,0

YKMH303 Biogas Technologies 3+0 4,5

KMH313 Biorefinery Processes 3+0 4,0

KMH407 Fuel and Energy Technologies 3+0 4,0

FİZ337 Güneş Enerjisi ve Uygulamaları 2+0 3,0

ÇEV320 Enerji Üretiminden Kaynaklanan Çevre Sorunları 3+0 4,0

İNŞ469 Renewable Energy with Water, Wind and Wave Power 3+0 4,5

YKMH302 Biomass Energy 3+0 4,0

KMH437 Alcohol Based Fuel 3+0 4,0

FİZ336 Solar Photovoltaics 2+0 3,0

FİZ304 Clean Energy Sources 2+0 3,0

**DEPARTMENT OF MECHANICAL ENGINEERING (30% ENGLISH)**

Department Web Page: <https://makine.eskisehir.edu.tr/>

Department Head : Prof. Dr. Oğuz ÇOLAK  
Deputy Department Head : Dr. Öğr. Üy. Hasan ŞAHİN  
Deputy Department Head : Dr. Öğr. Üy. Asım Anıl ÖNDER

**PROGRAM**

**I. Semester**

**II. Semester**

FİZ 105	(Eng)	Physics I	4+0	6,0	FİZ 106	(Eng)	Physics II	4+0	6,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5	FİZ 108	(Eng)	Physics Laboratory II	0+2	1,5

EMAT111		Calculus I	4+2	7,5	EMAT112		Calculus II	4+2	7,5
EKiM105	(Eng)	General Chemistry	4+0	6,0	MKM 102	(Eng)	Introduction to Mechanical Engineering	3+0	6,0
MKM 101		Technical Drawing for Mechanical Engineers	2+2	5,0	MKM 104		Computer Aided Engineering Technical Drawing	2+2	5,0
MKM 103	(Eng)	Technical English for Mechanical Engineers	2+0	2,0	TÜR 126		Turkish Language II	2+0	2,0
TÜR 125		Turkish Language I	2+0	2,0			Elective Courses		2,0
				30					30

### III. Semester

EMAT211		Differential Equation	3+1	4,5
BİL 200	(Eng)	Computer Programming	2+2	6,0
iKT356	(Eng)	Engineering Economics	3+0	4,5
EİST201	(Eng)	Engineering Statistics	3+0	4,0
MEK 217	(Eng)	Engineering Mechanics: Statics	3+0	5,0
TER 207	(Eng)	Thermodynamics I	3+0	4,0
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
				30

### V. Semester

MKM 301	(Eng)	Theory of Machines	3+0	7,0
MKM 302	(Eng)	Machine Design I	4+0	6,0
MEK 323	(Eng)	Fundamentals of Fluid Mechanics	4+0	6,5
MKM 309		Introduction to Finite Element Analysis	3+0	3,5
		Area Elective Courses		4,0
		Elective Courses		3,0
				30,0

### VII. Semester

MKM 403		Makine Mühendisliğinde Tasarım I	2+2	5,0
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### IV. Semester

EMAT223	(Eng)	Linear Algebra and Numerical Methods	2+2	4,5
TER 208	(Eng)	Thermodynamics II	3+0	5,0
MEK 216	(Eng)	Engineering Mechanics: Dynamics	3+0	4,0
MLZ 232	(Eng)	Introduction to Materials Science	3+0	3,5
EEM 214	(Eng)	Electrical Engineering for Mechanical Engineers	3+0	3,5
TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
MEK 311	(Eng)	Strength of Materials	4+0	5,5
				2,0
				30,0

### VI. Semester

MKM 401	(Eng)	Machine Design II	4+0	6,0
MKM 304		Manufacturing Techniques	2+2	5,0
MKM 306	(Eng)	Experimental Engineering	2+2	4,0
MKM 303	(Eng)	Heat Transfer	4+0	5,0
EEM 310	(Eng)	Control Systems	3+0	7,0
				3,0
				30,0

### VIII. Semester

iSG 402		Occupational Health and Safety II	2+0	2,0
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iSG 401	Occupational Health and Safety I	2+0	2,0	MAKSJ402	Mechanical Engineering Internship II	0+2	2,0
MAKSJ401	Mechanical Engineering Internship I	0+2	2,0	MAKSJ404	Mechanical Engineering Internship III	0+2	2,0
	Area Elective Courses		13,0	MKM 404	Mechanical Engineering Design II	2+4	5,0
	Elective Courses		8,0		Area Elective Courses		15,0
					Elective Courses		4,0
			<hr/>				<hr/>
			30,0				30,0

### Area Elective Courses

EEM 311	(Eng)	Principles of Energy Conversion	3+2	6,0	MKM 416		Theory of Elasticity	3+0	5,0
EEM 471	(Eng)	Electrical Machinery I	2+2	5,0	MKM 417		Nonconventional Manufacturing Techniques	3+0	5,0
EEM 472	(Eng)	Electrical Machinery II	2+2	5,0	MKM 419		Mechanics of Materials II	3+0	5,0
EEM 490	(Eng)	Nonlinear Systems	3+0	5,0	MKM 420		Manufacturing Quality	3+0	5,0
EEM 491	(Eng)	Linear Control Systems	3+0	5,0	MKM 421		Energy Management and Efficiency	3+0	5,0
EEM 493	(Eng)	Digital Control Systems	3+0	5,0	MKM 422	(Eng)	Micro/Nanoscale Fabrication and Characterization	3+0	5,0
EEM 494	(Eng)	Control Systems Laboratory	1+4	5,0	MKM 424		Advanced Driver Assistance Systems	3+0	5,0
iNŞ 467	(Eng)	Construction Equipments	3+0	4,5	MKM 426		Analysis and Evaluation of Cogeneration Systems	3+0	5,0
iNŞ 469	(Eng)	Renewable Energy With Water, Wind and Wave Power	3+0	4,5	MKM 427		Introduction to Composite Materials	3+0	5,0
iNŞ 453		Railway Engineering	3+0	4,5	MKM 428		Computational Fluid Dynamics	3+0	5,0
MEK 404	(Eng)	Applied Fluid Mechanics	2+2	5,0	MKM 437	(Eng)	Engineering Materials	3+0	5,0
MEK 405	(Eng)	Applied Strength of Materials	3+0	5,0	MKM 440	(Eng)	Introduction to Computer Aided Manufacturing	2+2	5,0
MEK 406	(Eng)	Mechanical Vibrations	3+0	5,0	MKM 440		Introduction to Computer Aided Manufacturing	3+0	5,0
MEK 439	(Eng)	Thermal System Design	2+2	5,0	MKM418		Materials Handling Techniques i	3+0	5,0
MKM 220		Problem Solving Methods	3+0	4,5	MKM429		Vehicle Simulation	3+0	5,0
MKM 222		Technical Report Writing and Presentation Skills in Engineeri	3+0	4,5	MLZ 307	(Eng)	Phase Diagrams	3+0	4,5
MKM 307		Engineering Materials for Mechanical Engineers	3+0	5,0	MLZ 314	(Eng)	Transport Phenomena in Materials Processing	4+0	6,0
MKM 330		MATLAB Programming for Engineers	1+2	5,0	MLZ 318	(Eng)	Metallic Materials	4+0	4,0

MKM 339	(Eng)	Introduction to Finite Element Method	2+2	5,0	MLZ 413	(Eng)	Powder Metallurgy	3+0	4,0
MKM 405		Machining and Machine Tools	3+0	5,0	MLZ 431	(Eng)	Alloys	3+0	4,0
MKM 406		Reliability in Machine Design	3+0	5,0	MLZ 433	(Eng)	Thin Film Technology	3+0	4,0
MKM 407		Maintenance in Mechanical Engineering	3+0	5,0	MLZ 434	(Eng)	Aviation Materials	3+0	4,0
MKM 408		Non-destructive Testing Methods	3+0	5,0	MLZ 444	(Eng)	Welding Technologies	3+0	4,0
MKM 409		Shape Memory Alloys	3+0	5,0	MLZ 445	(Eng)	Phase Transformations in Metals and Alloys	3+0	4,0
MKM 410		Aircraft Engine Design	3+0	5,0	MLZ450	(Eng)	Computational Material Science	3+0	4,0
MKM 411		System Engineering Fundamentals	3+0	5,0	MLZ454	(Eng)	Smart Materials	3+0	4,0
MKM 412		Internal Combustion Engines	3+0	5,0	MLZ456	(Eng)	Physical Properties of Nanomaterials	3+0	4,0
MKM 413		Engineering Applications of Finite Element Analysis	3+0	5,0	MTR 301		Introduction to Mechatronics	3+0	5,0
MKM 414		Refrigeration Systems	3+0	5,0	MTR 401	(Eng)	Mechatronics	2+2	5,0

### Elective Courses

ANT 452		First Aid	1+2	4,0	iSN 409		Organizational Communication	3+0	4,5
BEÖ 155		Physical Education	2+0	2,0	iSP 151	(Spa.)	Spanish I	4+0	4,0
BEÖ 176		Trekking	1+2	4,0	iSP 152	(Spa.)	Spanish II	4+0	4,0
ESTÜ 101		Introduction to University Life	0+1	2,0	iŞL 101	(Eng)	Introduction to Business	3+0	4,5
ESTÜ 102	(Eng)	Negotiation Techniques	2+0	3,0	iŞL 101		Introduction to Business	3+0	4,5
ESTÜ 103		Ceramic Design Processes	2+1	3,0	iŞL 102		Management and Organization	3+0	4,0
ESTÜ 104		Academic and Life Skills	2+1	3,0	iŞL 103	(Eng)	Business Management	3+0	3,5
ESTÜ 106		Project Management	2+1	3,0	iŞL 201	(Eng)	Business Organization	3+0	4,0
ESTÜ 111		Volunteering Works	1+2	4,0	iŞL 209		Business Management	2+0	2,0
ESTÜ 112		Cyber Security for Everyone	2+0	2,0	iŞL 301		Human Resources Management	3+0	4,0
ESTÜ 113		Design Thinking	3+0	3,0	iŞL 302	(Eng)	Production Management	3+0	4,5
ESTÜ 114		Visual Thinking	3+0	3,0	iŞL 321		Applied Entrepreneurship	3+1	5,0

ESTÜ 115	Photographic Viewpoint	2+1	3,0	İŞL 406		Strategic Management	3+0	4,5
ESTÜ 116	Computer Aided Design I	3+0	3,0	İŞL 421		Entrepreneurship	2+0	3,0
ESTÜ 117	Computer Aided Design II	3+0	3,0	İŞL 454	(Eng)	Management of Technology	3+0	4,5
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	İŞL 475		Techno-Entrepreneurship	3+0	4,0
ESTÜ 119	Flute	3+1	3,0	İTA 255	(İta.)	Italian I	3+0	4,0
ESTÜ 120	Solfege	3+1	3,0	İTA 256	(İta.)	Italian II	3+0	4,0
ESTÜ 121	Piano	3+1	3,0	JAP 301	(Jap.)	Japanese I	4+0	4,0
ESTÜ 122	Guitar	3+1	3,0	JAP 302	(Jap.)	Japanese II	4+0	4,0
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MFALM101	(Ger)	German for Engineering I	3+0	4,0
ESTÜ 125	Philosophy of Science	3+0	3,0	MFALM102	(Ger)	German for Engineering II	3+0	4,0
ESTÜ 127	Diction	1+2	3,0	MFALM201	(Ger)	German for Engineering III	3+0	4,0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MFALM202	(Ger)	German for Engineering IV	3+0	4,0
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MUH 151		Introduction to Accounting	3+0	4,5
ESTÜ 132	History of Political Thought	3+0	3,0	MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
ESTÜ 133	Disability and Awareness	3+0	3,0	MÜH 404	(Eng)	Innovation Management	3+0	3,0
ESTÜ 201	Turkish Sign Language	3+0	3,0	MÜZ 151		Short History of Music	2+0	3,0
ESTÜ 203	Introduction to Sociology	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0	2,0
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0	ÖMB 322		Ethics of Science and Research	2+0	3,0
ESTÜ 206	Financial Literacy	3+0	3,0	PSİ 102		Psychology	3+0	3,5
ESTÜ 301	Science Communication	2+0	3,0	PZL 211	(Eng)	Principles of Marketing	3+0	5,0
ESTÜ 307	Children Rights and Family Education	2+0	2,0	PZL 302		Marketing Management	3+0	4,5
ESTÜ 401	Introduction to Professional Life	1+1	2,0	REK 242		Sports Aviation	1+2	3,0
ESTÜ 402	Coaching and Leadership	3+0	5,0	RTV 281		Digital Literacy	2+2	4,0
ESTÜ 403	Basic Computer Utilization	3+0	4,0	RUS 255	(Rus.)	Russian I	3+0	4,0
ESTÜ 405	Computer Programming	3+0	5,0	RUS 256	(Rus.)	Russian II	3+0	4,0
FOT 202	Photography	2+0	3,0	SAĞ 102		First Aid	2+0	2,5

FRA 255	(Fra.)	Franstzca I	3+0	4,0	SNT 155	History of Art	2+0	2,0
FRA 256	(Fra.)	Franstzca II	3+0	4,0	SOS 154	Man and Sociology	2+0	3,0
HUK 252		iř Hukuku	2+0	2,5	THU 203	Community Services	0+2	3,0
HUK 458		Sinai Haklar Sistemi ve Teknolojik Geliřme	3+0	3,0	TiY 121	Introduction to Theatre	2+0	3,0
iKT 209	(Eng)	Money and Banking (Para ve Banka)	3+0	5,0	TiY 152	Theatre	2+0	2,5
İLT 201		Bireylerarası İletifim	3+0	4,5	TiY 308	Republic Era Turkish Theatre	2+0	3,0
İLT 419		Beden Dili ve Diksiyon	2+0	5,0	TOP 102	Surveying	2+2	4,5
iSN 309		Kitle İletifimi	3+0	3,0				

## MECHATRONICS MINOR PROGRAM

### COMPULSORY COURSE GROUP

MTR301 Introduction to Mechatronics	3+0	5,0	EEM471 Electrical Machinery I	2+2	5,0
ENM207 Advanced Programming	4+0	4,5	EEM310 Control Systems	3+0	7,0
EEM451 Industrial Control Systems	1+4	5,0	EEM452 Introduction to Robotics	3+0	5,0

### TECHNICAL ELECTIVE COURSE GROUP

EEM475 Power Electronics I	3+0	5,0	HTK430 Hava Trafik Kontrol ve Operasyonlarının Simülasyonu	0+4	4,5
EEM486 Computer Architecture	3+0	5,0	BİL802 Görsel Programlama	4+0	4,0
EEM494 Control Systems Laboratory	1+4	5,0	İST332 Decision Making Theory	2+0	3,0
BİM493 Mobile Programming I	3+0	4,5	İST356 Phyton ile Programlama	4+0	5,0
BİM423 Software Engineering	3+2	6,0	BİM309 Artificial Intelligence	3+0	4,5
BİM466 Fuzzy Logic	3+0	4,5			
BİM468 Computer Aided Design	3+0	4,5			
HEE434 Automatic Control	2+2	4,5			

## ENGINE TECHNOLOGIES MINOR PROGRAM

### COMPULSORY COURSE GROUP

MTEK301 Introduction to Internal Combustion Engines	2+0	5,0	MTEK302 Gas Turbine Engine Systems	2+0	5,0
MTEK303 Introduction to Jet Engines	2+0	4,0			

**TECHNICAL ELECTIVE COURSE GROUP**

MTEK305	In-Cylinder Flow and Combustion in Piston Engines	1+0	2,0	MTEK308	Non-Destructive Testing Methods	2+0	4,0
MTEK306	Material and Production Technique Selection	2+0	4,0	MTEK309	Cooling and Thermal Design in Reciprocating Engines	1+0	2,0
MTEK304	Engine Dynamics	2+0	4,0	MTEK307	Design of Internal Combustion Engine Components	2+0	4,0
MTEK310	Predictive Maintenance Methods	2+0	3,0	MTEK311	1D Modeling and Performance in Reciprocating Engines	1+0	2,0
				MLZ474	Aviation Materials	2+0	3,0

**DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING  
(ENGLISH)**

Materials Science and Engineering is an interdisciplinary field of science that studies ceramic, metallic, polymeric and composite materials and is strongly interrelated with the basic sciences of physics, chemistry and biology as well as chemical and mechanical engineering. The courses offered in the Materials Science and Engineering program especially emphasize the microstructure-property-performance relationships as well as factors that affect the materials behaviour in service. Materials are critical to all fields of engineering since design is often constrained by their limited availability. Furthermore, innovations in materials may lead to new design criteria and result in emergence of new products. Thus, most programs within the Faculty of Engineering involve one or two courses on Materials Science and Engineering. In spite of the fact that the metals and their alloys still constitute the most widely used family of engineering materials, improvements and developments in ceramic, polymer and composite materials are being achieved at an increasing rate. The department was established in 1993 as Ceramic Engineering Department then in 2002 the curriculum was extended and its name was changed to Department of Materials Science & Engineering. The department is located at the İki Eylül Campus and occupies a covered area of 5000 m<sup>2</sup>. The departments is governed by the head of department and two deputy head of department, one of whom takes care of technical activities of the department while the other assists the head of department in academic activities of the department. Department Web Page: <https://matse.eskisehir.edu.tr/>

Department Head	: Prof. Dr. Aydın DOĞAN
Deputy Department Head	: Assoc. Prof. Dr. Ali ÇELİK
Deputy Department Head	: Asst. Prof. Dr. Hüseyin Boğaç POYRAZ

**I. Semester**

EKİM 101	(Eng)	General Chemistry I	4+0	6,0
EMAT 111	(Eng)	Calculus I	4+2	7,5
FİZ 105	(Eng)	Physics I	4+0	6,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5
MLZ 109	(Eng)	Materials World	2+0	2,5
TRS 127	(Eng)	Technical Drawing	2+2	4,5
TÜR 125		Turkish Language I	2+0	2,0

**II. Semester**

EKİM 102	(Eng)	General Chemistry II	4+0
EKİM 110	(Eng)	General Chemistry Laboratory	0+2
EMAT 112	(Eng)	Calculus II	4+2
FİZ 106	(Eng)	Physics II	4+0
FİZ 108	(Eng)	Physics Laboratory II	0+2
MLZ 114	(Eng)	Structure of Materials	2+0
MLZ 116	(Eng)	Freshman Project	1+0
TÜR 126		Turkish Language II	2+0
		Elective Courses	

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30,0

**III. Semester**

EİST 201	(Eng)	Engineering Statistics	3+0	4,0
EMAT 211	(Eng)	Differential Equation	3+1	4,5
EMAT 223	(Eng)	Linear Algebra and Numerical Methods	2+2	4,5
MEK 215	(Eng)	Statics and Strength of Materials	3+0	4,5
MLZ 221	(Eng)	Physical Properties of Materials	2+0	2,5

**IV. Semester**

BİL 814	(Eng)	Computing and Programming	2+2
ETK 208	(Eng)	Engineering Ethics	1+0
iSG 401		Occupational Health and Safety I	2+0
MLZ 208	(Eng)	Electrical, Magnetic and Optical Properties of Materials	2+0
MLZ 216	(Eng)	Mechanical Behaviour of Materials I	2+0

MLZ 223	(Eng)	Polymer Chemistry	2+0	3,0	MLZ 218	(Eng)	Ceramic Processing	2+0	
MLZ 225	(Eng)	Raw Materials and Unit Operations	2+0	2,0	MLZ 222	(Eng)	Materials Characterization Techniques Laboratory	0+2	
MLZ 229	(Eng)	Materials Characterization Techniques I	2+0	3,0	MLZ 230	(Eng)	Materials Characterization Techniques II	2+0	
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0	MLZ 231	(Eng)	Materials Thermodynamics I	2+1	
					TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	
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				30,0					
<b>V. Semester</b>					<b>VI. Semester</b>				
iKT 356	(Eng)	Engineering Economics	3+0	4,5	iLT 328	(Eng)	Communication Skills	1+0	
MLZ 315	(Eng)	Electrochemistry	1+0	1,5	MLZ 326	(Eng)	Project Management	1+0	
MLZ 327	(Eng)	Mechanical Behaviour of Materials II	2+0	3,0	MLZ 328	(Eng)	Materials and Energy Balance	2+0	
MLZ 329	(Eng)	Materials Thermodynamics II	2+1	4,5	MLZ 330	(Eng)	Silicate Ceramics	2+0	
MLZ 331	(Eng)	Materials Processing Laboratory I	0+2	2,0	MLZ 332	(Eng)	Processing of Polymers	2+0	
MLZ 333	(Eng)	Phase Diagrams	2+0	3,0	MLZ 336	(Eng)	Metallic Materials II	2+0	
MLZ 335	(Eng)	Metallic Materials I	2+0	3,0	MLZ 338	(Eng)	Transport Phenomena in Materials Processing II	2+0	
MLZ 337	(Eng)	Transport Phenomena in Materials Processing I	2+0	3,0	Area Elective Courses				
MLZ 339	(Eng)	Non-Crystalline Materials	2+0	3,0	Elective Courses				
MLZSJ 301	(Eng)	Materials Science and Engineering Internship I	0+2	2,5					
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				30,0					
<b>VII. Semester</b>					<b>VIII. Semester</b>				
iSG 402		Occupational Health and Safety II	2+0	2,0	MLZ 460	(Eng)	Materials Selection and Design	2+2	
MLZ 447	(Eng)	Materials Processing Laboratory II	0+2	3,0	MLZ 462	(Eng)	Application in Materials Engineering	2+0	
MLZ 449	(Eng)	Innovation and Enterprenourship	1+0	1,0	MLZ 464	(Eng)	Project Practice for Material Science and Engineering	2+4	
MLZ 453	(Eng)	Advanced Materials and Composites	2+0	3,0	MLZSJ 402	(Eng)	Materials Science and Engineering Internship II	0+2	
MLZ 455	(Eng)	Heat Treatment	2+0	3,0	Area Elective Courses				
MLZ 457	(Eng)	Manufacturing with Materials	2+0	3,0	Elective Courses				
MLZ 459	(Eng)	Degradation of Engineering Materials	2+0	3,0					
MLZ 463	(Eng)	Project Preparation for Material Science and Engineering	1+2	3,0					
TKY 411	(Eng)	Quality Control	2+0	3,0					
				<hr/>					
				6,0					
<b>Area Elective Courses</b>									



**Area Elective Courses**

MLZ 334	(Eng)	Fundamentals of Semiconductors	2+0	3,0	MLZ 474	(Eng)	Aviation Materials	2+0
MLZ 342	(Eng)	Whitewares	2+0	3,0	MLZ 475	(Eng)	Polymer Matrix Composites	2+0
MLZ 354	(Eng)	Spectroscopic Analysis of Materials	2+0	3,0	MLZ 476	(Eng)	Engineering Materials for Armour Applications	2+0
MLZ 461	(Eng)	Glass Technology	2+0	3,0	MLZ 477	(Eng)	Microscopy in Practice	2+0
MLZ 465	(Eng)	Machining Technology of Metals	2+0	3,0	MLZ 478	(Eng)	Mathematical Relations in Powder Processing	2+0
MLZ 466	(Eng)	Enamels	2+0	3,0	MLZ 479	(Eng)	Electroceramic Materials	2+0
MLZ 467	(Eng)	Particle Size Control Mechanism	2+0	3,0	MLZ 480	(Eng)	Tile and Brick	2+0
MLZ 468	(Eng)	Rubber and Rubber Technology	2+0	3,0	MLZ 482	(Eng)	Refractories	2+0
MLZ 469	(Eng)	Alloys	2+0	3,0	MLZ 484	(Eng)	Glass Ceramics	2+0
MLZ 470	(Eng)	Cement and Concrete	2+0	3,0	MLZ 486	(Eng)	Strengthening Mechanisms in Materials	2+0
MLZ 471	(Eng)	Nano Materials and Nano Technology	2+0	3,0	MLZ 488	(Eng)	Technical Glasses	2+0
MLZ 472	(Eng)	Biomaterials	2+0	3,0	MLZ 492	(Eng)	Materials in Cosmetic Science	2+0
MLZ 473	(Eng)	Carbon Nanomaterials	2+0	3,0	MLZ 494	(Eng)	Statistical Data Analysis and Optimization in Polymer Processing	2+0

**Elective Courses**

ARK 108		Archaeology	2+0	2,0	İSN 309		Mass Media	3+0
ANT 452		First Aid	1+2	4,0	İSN 409		Organizational Communication	3+0
BEÖ 155		Physical Education	2+0	2,0	İSP 151	(Spa.)	Spanish I	4+0
BEÖ 176		Trekking	1+2	4,0	İSP 152	(Spa.)	Spanish II	4+0
ÇEV 462		Computer Aided Engineering Design	3+0	4,5	İŞL 101	(Eng)	Introduction to Business	3+0
ESTÜ 101		Introduction to University Life	0+1	2,0	İŞL 101		Introduction to Business	3+0
ESTÜ 102	(Eng)	Negotiation Techniques Class	2+0	3,0	İŞL 102		Management and Organization	3+0
ESTÜ 103		Ceramic Design Processes	2+1	3,0	İŞL 103	(Eng)	Business Management	3+0
ESTÜ 104		Academic and Life Skills	2+1	3,0	İŞL 201	(Eng)	Business Organization	3+0
ESTÜ 106		Project Management	2+1	3,0	İŞL 209		Business Management	2+0
ESTÜ 111		Volunteering Works	1+2	4,0	İŞL 301		Human Resources Management	3+0
ESTÜ 112		Cyber Security for Everyone	2+0	2,0	İŞL 302	(Eng)	Production Management	3+0
ESTÜ 113		Design Thinking	3+0	3,0	İŞL 321		Applied Entrepreneurship	3+1
ESTÜ 114		Visual Thinking	3+0	3,0	İŞL 406		Strategic Management	3+0
ESTÜ 115		Photographic Viewpoint	2+1	3,0	İŞL 421		Entrepreneurship	2+0

ESTÜ 116	Computer Aided Design I	3+0	3,0	İŞL 454	(Eng)	Management of Technology	3+0
ESTÜ 117	Computer Aided Design II	3+0	3,0	İŞL 475		Techno-Entrepreneurship	3+0
ESTÜ 118	Visual Thinking with Concepts	3+0	3,0	İTA 255	(İta.)	Italian I	3+0
ESTÜ 119	Flute	3+1	3,0	İTA 256	(İta.)	Italian II	3+0
ESTÜ 120	Solfege	3+1	3,0	JAP 301	(Jap.)	Japanese I	4+0
ESTÜ 121	Piano	3+1	3,0	JAP 302	(Jap.)	Japanese II	4+0
ESTÜ 122	Guitar	3+1	3,0	MFALM 101	(Ger)	German for Engineering I	3+0
ESTÜ 123	Gender Equality in Work Life	2+0	3,0	MFALM 102	(Ger)	German for Engineering II	3+0
ESTÜ 125	Philosophy of Science	3+0	3,0	MFALM 201	(Ger)	German for Engineering III	3+0
ESTÜ 127	Diction	1+2	3,0	MFALM 202	(Ger)	German for Engineering IV	3+0
ESTÜ 129	Turkish as a Foreign Language I	2+0	2,0	MUH 151		Introduction to Accounting	3+0
ESTÜ 130	Turkish as a Foreign Language II	2+0	2,0	MÜH 402	(Eng)	Engineering Ethics	2+0
ESTÜ 132	History of Political Thought	3+0	3,0	MÜH 404	(Eng)	Innovation Management	3+0
ESTÜ 133	Disability and Awareness	3+0	3,0	MÜZ 151		Short History of Music	2+0
ESTÜ 201	Turkish Sign Language	3+0	3,0	MÜZ 157		Traditional Turkish Art Music	2+0
ESTÜ 203	Sosyolojiye Giriş	3+0	3,0	ÖMB 322		Ethics of Science and Research	2+0
ESTÜ 204	Effective Reading and Writing Skills	3+0	4,0	PSİ 102		Psychology	3+0
ESTÜ 206	Financial Literacy	3+0	3,0	PZL 302		Marketing Management	3+0
ESTÜ 301	Science Communication	2+0	3,0	PZL 211	(Eng)	Principles of Marketing	3+0
ESTÜ 307	Children Rights and Family Education	2+0	2,0	REK 242		Sports Aviation	1+2
ESTÜ 401	Introduction to Professional Life	1+1	2,0	RTV 281		Digital Literacy	2+2
ESTÜ 402	Coaching and Leadership	3+0	3,0	RUS 255	(Rus.)	Russian I	3+0
ESTÜ 403	Basic Computer Utilization	3+0	4,0	RUS 256	(Rus.)	Russian II	3+0
ESTÜ 405	Computer Programming	3+0	5,0	SAĞ 102		First Aid	2+0
FOT 202	Photography	2+0	3,0	SNT 155		History of Art	2+0
FRA 255	(Fra.) French I	3+0	4,0	SOS 154		Man and Sociology	2+0
FRA 256	(Fra.) French II	3+0	4,0	TİY 121		Introduction to Theatre	2+0
HUK 252	Labor Law	2+0	2,5	TİY 152		Theatre	2+0
HUK 458	Industrial Rights and Technological Development	3+0	3,0	TİY 308		Republic Era Turkish Theatre	2+0
İKT 209	(Eng) Money and Banking	3+0	5,0	THU 203		Community Services	0+2
İLT 201	Interpersonal Communication	3+0	4,5	TOP 102		Surveying	2+2
İLT 419	Body Language and Diction	2+0	5,0				

## COURSE CONTENTS

### **BİM449 Introduction to Game Programming**

**(3+0) 4,5**

Introduction to Game Programming: Differences between game programming and graphical programming, Game time and real time; Linear Algebra for Game Programming: Object, camera, and real world coordinate systems; Two-Dimensional Game Programming; Three Dimensional Game Programming: Light models, Perspective transformations; Input, Sound, and Physics for the Game; Using Artificial Intelligence in Game Programming; Graphical User Interfaces; Scripting Languages and Data Formats; Networked Games.

### **BİM459 Artificial Intelligence in Healthcare**

**(3+0) 4,5**

Digital Transformation in Healthcare; Medical Data Analysis; Computational Model Development in Healthcare Problems and Tools: Tensorflow, Keras, Pytorch, Anaconda, NumPy, ScikitLearn, OpenCV; Computational Model Development Stages; Clinical problem definition, Data curation, Data annotation, Model development, Model evaluation; Deep Learning Techniques in Medical Data Analysis; Medical Data: Imaging data, Text data, Reports, Demographics, Data privacy; Medical Data Analysis Applications: Medical image segmentation, Clinical object detection and tracking, Lesion detection and classification, Prognosis.

**BİM461 Introduction to Cloud Computing****(3+0) 4,5**

Cloud Concepts Overview: Advantages of the cloud, Introduction to cloud services; Cloud Economics and Billing: Fundamentals of pricing, Total cost of ownership, Billing and cost management; Global Infrastructure; Cloud Security: Shared responsibility model, Securing accounts, Securing data; Networking and Content Delivery: Networking basics, Virtual private cloud; Compute Services; Storage Services; Databases Services; Cloud Architecture; Auto Scaling and Monitoring.

**BİM463 Introduction to Natural Language Processing****(3+0) 4,5**

Basic Text Processing: Tokenization; Morphological Analysis: Stemming, Lemmatization, Stopwords; N-gram Language Models; Text Classification; Lexical Semantics; Word Embeddings; Word Classes and Part-of-Speech Tagging; Named-entity Recognition; Hidden Markov Models; Syntactic Analysis; Semantic Parsing; Statistical Parsing; Natural Language Processing Applications with Deep Learning.

**BİM465 Introduction to Data Science****(3+0) 4,5**

Fundamentals of Data Science; Project Life Cycle in Data Science; Statistical Analysis in Data Science; Data Collection and Processing; Feature Engineering: Feature extraction, Feature selection, Feature transformation, Dimension reduction; Data Modeling; Data Visualization; Clustering; Regression Analysis; Classification; Big Data Analysis; Business Intelligence and Data Warehouse; Data Science Applications with Deep Learning.

**ENM321 Industrial Case Studies****(5+0) 5,0**

Interview; Case Questions; Case Analysis; Graph Analysis; Case Analysis Tools; Effective Use of Graphs; Case Analysis Frameworks; Data Interpretation; Effective Use of Graphs; SWOT Analysis; Fishbone; 5P; 7S; Ivy Case System; Business World; Real-life Problems; Industrial Case; Communication; Presentation; Data Visualization; Data Analysis; Critical Thinking; Brainstorming; Strategic Thinking; Analytical Thinking; Cause and Effect Relationship; Storytelling with Data.

**ENM323 Energy Systems Planning****(2+1) 5,0**

Historical trends in energy supply and demand; renewable energy sources and related technologies. Global climate change, security, reliability and economic issues in energy operations and planning issues. Energy demand and supply forecasting, energy transportation and storage. Smart grid and generation expansion decisions. Problem solving techniques and methods applied in the pursuit of decision making in energy systems.

**ENM314 Investment Analysis****(3+0) 5,0**

Understanding powerful relationships between risk, return, and price. Intuitively explore the baseline fundamental law of Financial Analysis. Calculating stock returns for dividend and non-dividend paying stocks, manually. Estimating expected returns using the mean method. Estimating expected returns using state contingent weighted probabilities. Estimating expected returns using Asset Pricing Models including the Capital Asset Pricing Model. Estimating the total risk, market risk of a stock. Estimating the return of a multi-asset portfolio. Measuring the risk of a multi-asset portfolio. Exploring Diversification, Optimisation Risk reduction by diversification.

**ENM423 Queuing Models****(3+0) 5,0**

Introduction to queuing systems and understanding the basic features of queuing systems. Examination of the characteristics of queuing systems, Examination of single or multi-service queuing models. (M/M/1, M/M/c, G/M/c, M/G/1). Performing equilibrium analysis. Ensuring optimal control of queues. Examination of queuing networks. Applications of queuing theory in production and computer systems.

**ENM425 Scheduling****(3+0) 5,0**

Introduction to Scheduling; Scheduling Problems in Manufacturing and Service Systems; Performance Measures in Scheduling Problems; Single Machine Scheduling Problems and Solution Methods; Job Shop Scheduling Problems and Solution Methods; Heuristic Solution Approaches; Workforce Scheduling Problems; Exam Scheduling Problems; Sports Scheduling Problems; Transportation Scheduling Problems.

**ENM316 Statistical Forecasting and Time Series****(2+1) 5,0**

Analysis of Time Series Data, Components and Visualization, Correlation and Autocorrelation, Analysis of Prediction Errors, Moving Averages, Exponential Smoothing, Holt Method, Winters Method, Autoregressive Models, Regression, Machine Learning Models

**ENM325 Theory and Algorithms in Nonlinear Prog.****(2+1) 5,0**

Nonlinear Programming Problems and Examples of Mathematical Model; Convex Set; Convex Function; Concave Function; One Variable Unconstrained Optimization Problems, Mathematical Models and Algorithms: Bisection Method, Newton Method; Multi Variable Unconstrained Optimization Problems, Mathematical Models and Algorithms: Gradient Search Method, Multi Variable Newton Method; Multi Variable Constraint Problems, Mathematical Models and Algorithms: Karush-Kuhn-Tucker Conditions, Frank-Wolfe Algorithms, The Sequential Unconstrained Minimization Technique (SUMT).

**EEM416 Introduction to GNU/Linux Operating Systems****(3+0) 5,0**

History of Linux and GNU project; Linux Kernel basics, Linux distributions, graphical desktop environments, file systems, BASH shell programming, GNU utilities, process management and Linux scheduler, Linux boot process, systemd, init, LKM, eBPF, control

groups, namespaces, Linux network system, disk and storage management, security of Linux systems, hardening Linux system security, SELinux, AppArmor, SSH, firewall yönetimi, basic system administration.

### **ESTÜ132 History of Political Thought**

**(3+0) 3,0**

Society, Thought and Fiction: Primitive societies and the beginning of thought, The emergence of political fiction; From Organic Evolution to Social-Cultural Evolution: Man's life in the stone ages, Primitive society's way of thinking; Transition from Primitive Community to Civilized Society and Spread of Civilization: Birth of the first civilized society and social division of labor, Spread of civilizations; Political Thinking in Pre-Greek Civilizations: Political Thought in Mesopotamia, Egypt and Anatolia; Political Thinking in Contemporary Greek Civilizations: Political Thinking in Persia, India, China, and the Hebrews; Society and political thought in ancient Greece; Society and Political Thinking in Rome: Economic and socio-political developments in Rome, political thinking in Rome; Society and Political Thinking in the Medieval Latin World: Economic, social and political developments in the Latin world; political thought in the Latin world; Society and Political Thinking in the Modern Age: Economic, social and political developments in Western societies, transition from feudal order to capitalist system; Political Thinking in Modern Western Societies: Religious Reform, Absolute Monarchy and Enlightenment.

### **ÇEV362 Environmen Economy**

**(2+0) 3,0**

Environment and Economy: Conceptual framework, Environmental assets and property issue; Economic and Political Approaches to Natural Resources and Environmental Problems in the Historical Development Process: Macroeconomic approach in environmental economics, Environmental policy and management; Solution Alternatives to Environmental Problems: Legal and market-based solutions; Microeconomic Analysis of Environmental Pollution: Sustainable development indicators and indices, Pollution economics and economic approaches to pollution control, Classification of resources in economy; Principles of Utilizing Natural Resources and Economic Development; European Union Environmental Policy.

### **ÇEV354 Environmental Footprints**

**(2+0) 3,0**

Footprint Family; Ecological Footprint; Calculation of Ecological Footprint; Environmental Footprint; Carbon Footprint; Direct and Indirect Carbon Footprint; Water Footprint; Green-Blue-Gray Water Footprint; Virtual Water Footprint; Energy Footprint; Emission Footprint; Nitrogen Footprint; Land Footprint; Biodiversity Footprint; Food Waste Footprint; Corporate Footprints, Product Footprints, Global Footprints Management Strategies; Footprints Calculation Methodology, Input-Output Analysis, Climate Change and Footprints, Footprint Reduction Strategies; Global Footprint Network activity

### **ÇEV356 Reuse of Wastewater for the Sustainability of Water Resources**

**(2+0) 3,0**

Introduction: Importance of wastewater reuse for sustainable use of water resources; Wastewater Reclamation and Reuse Planning; Community Health and Environmental Effects; Importance of Wastewater Reuse for the Future; Wastewater Reuse Application Areas: Urban reuse, Industrial reuse, Land irrigation and agricultural reuse; Groundwater Supply; Treatment Technologies for Reuse; Distribution and Storage of Reclaimed Water; Case Studies.

### **ÇEV358 Global Climate Change**

**(2+0) 3,0**

Structure of the Atmosphere: Layers of the atmosphere, Energy balance of the Earth; Fundamentals of Climate Change: Components of climate, Effects of natural sources on climate, Greenhouse gases and effects, Global warming; Historical Change of Climate; Effects of Climate Change: Sea level rise, Temperature increases, Effects on Biodiversity; Modeling of Climate Change; Climate Change and Sustainable Development: Sustainable use and protection of resources; International and National Battle with Climate Change: UN climate change framework agreement, Paris agreement, Kyoto protocol, Montreal protocol, Turkey's greenhouse gas inventory

### **ÇEV360 Corporate Sustainability Management**

**(2+0) 3,0**

Sustainable Development, Environmental, Economic and Social Dimensions; United Nations Sustainable Development Goals; Corporate Sustainability and Responsibilities; Climate Policies in Turkey and World; European Green Deal and Corporate Perspectives ; Circular Economy and Resource Efficiency: Zero Waste Principles; Corporate Governance for Sustainability; Sustainability Reports, Corporate Sustainability Indexes; Measurement of Corporate Sustainability Performance: Performance evaluation frameworks, Indicators and methods used in performance measurement.

### **ÇEV327 Green and Sustainable Agriculture**

**(2+0) 3,0**

What is Environment: Ecosystem and its features; The reasons for the emergence of environmental problems; Agriculture methods; sustainable, organic, traditional agriculture; Agricultural environmental policies in Turkey; Chemical fertilizers: Nitrogen and phosphorus fertilizers; Pollutant sources: Soil and water pollution; Agriculture and gas emissions; Agricultural mechanization and its environmental effects; Environmental effects of industrial livestock methods; Agriculture and erosion; Pesticide pollution: Behavior of pesticides in the environment; Heavy metal accumulation; Incorrect irrigation; Green agriculture; European Green Deal; Other agricultural applications.

### **MLZ479 Electroceramic Materials**

**(2+0) 3,0**

Ceramic Insulators, Semiconductor Ceramics, PTC and NTC Thermistors, Ferroelectric ceramics and hysteresis loops, Barium Titanate capacitors, PZT ceramics and their applications, Thermistors, Superconducting ceramics, PLZT Optical ceramics, Measurement of electromechanical properties, Application Examples

**"The contents of the newly opened courses in the 2023-2024 Academic Year are available above. You can access other course contents from the 2022-2023 Academic Year course contents section."**