FACULTY OF ENGINEERING

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

Faculty of Engineering and Architecture 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. Süleyman KAYTAKOĞLU
Vice Dean	: Assoc. Prof. Dr. Erhan AYAS
Vice Dean	: Assoc. Prof. Dr. Gökhan ÖZDEMİR
Secretary of Faculty	: Mehmet GÜL

STAFF

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Assistant professors: Ilgın ACAR , Şener AĞALAR, Hatice AKAKIN, Levent AKYALÇIN , Sema AKYALÇIN , Hicran ALTUĞ , Ahmet ARSLAN, Kadri Can ATLI , Ümmühan BAŞARAN , Alper BİLGE , Suzan BİRAN AY , Hande ÇELEBİ, Ahmet Ozan ÇELİK , Yasemin ÇELİK , Elif DEMİREL , Leman Esra DOLGUN, Emrah DÖLEKÇEKİÇ , Banu GÜNER , Zerrin GÜNKAYA , Zehra KAMIŞLI ÖZTÜRK , Filiz KAREL , Nergiz KASIMBEYLİ , İrfan KAYA , Murat KILIÇ , Serkan KIVRAK, Mehmet İnanç ONUR, S. Eren ÖCAL , Elif ÖDEŞ AKBAY , Özlem ÖZDEN ÜZMEZ , İsmail Özgür ÖZER , İsmail SAN , Gül İpek SELİMOĞLU , Ali Arda ŞORMAN, Kıvanç TAŞKIN, Cihan TOPAL , İrfan TÖRE , Semiha TÜRKAY, Mustafa Şeref TÜZEMEN , Alper Kürşat UYSAL , Hakkı Ulaş ÜNAL , Haluk YAPICIOĞLU , Tolga YASA , Sevcan YILMAZ GÜNDÜZ, Zehra YİĞİT AVDAN

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Research Assistants: Emine AKYOL , Mehmet ALEGÖZ, Oğuzkağan ALIÇ , Melis ALPASLAN , Evren ARIÖZ , Ahmet AYDIN , Özge AYVAZOĞLU , Eren BALABAN , Burak BENLİGİRAY , Canberk BOLAT , Gürhan CEYLAN, Gökhan ÇIPLAK, Emre ÇİMEN , Emin Talip DEMİRKIRAN , Kamil Burak DERMENCİ , Gülçin DİNÇ YALÇIN , Güray EMİR , Zeliha ERGÜL , Hüseyin Ersin EROL , Zeynep İdil ERZURUM , İbrahim ESEN , Burak EVİRGEN , Hakan GÜL , Emir Zafer HOŞGÜN, Emre IŞIN , Banu İÇMEN , Mutlu KARAŞOĞLU , Zühal KARTAL, Emrah KAYA , Eren KAYA , Bekir Tuna KAYAALP , Elif KAYNAK, Onur KILIÇ , Volkan KİRİÇÇİ , Okan KOÇKAYA , Ergin KOSA , Hande MARULCUOĞLU , Altan ONAT , Asım Anıl ÖNDER , Derya ÖVER KAMAN , Alp ÖZDEMİR , Yalçın ÖZDEMİR , Zeynep ÖZDEMİR , Salih Çağrı ÖZER , Erdem ÖZYURT, Hüseyin B. POYRAZ, Umut SAVACI, Müge SOYUÖZ, Burcu ŞİMŞEK, Murat TAMER , Sibel TAŞ , Tansu TEMEL , Çağla Gül TOSUN , Eda TUNA , Onur TUNABOYU , Emre URAZ , Can UYSAL , Gökçen UYSAL, Seval YAVAŞ , Özen YELBAŞI , Burcu YILMAZEL , Özgür YURDAKUL , Ali YÜREKLİ , Abdulkadir ZİREK

DEPARTMENT OF CHEMICAL ENGINEERING (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.% 100 of education language is English.

PROGRAM

I. SEMESTER

FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
KİM 117 (Eng)	General Chemistry I	4+0	6,0
KMH 105 (Eng)	Technical English	2+0	2,5
MAT 805 (Eng)	Calculus I	4+2	7,5
TRS 127 (Eng)	Technical Drawing	2+2	4,5
TÜR 125	Turkish Language I	2+0	2,0
			30,0

II. SEMESTER

FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
KİM 118 (Eng)	General Chemistry II	4+0	6,0
KMH 108 (Eng)	Introduction to Chemical Engineering	2+0	3,5
MAT 806 (Eng)	Calculus II	4+2	7,5
TÜR 126	Turkish Language II	2+0	2,0
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

BİL 813 (Eng)	Computer Programming in Engineering	2+2	4,5
İKT 151 (Eng)	Economics	3+0	3,0
KİM 208 (Eng)	Organic Chemistry	3+0	4,0
KİM 211 (Eng)	Analytical Chemistry	3+0	3,0
KİM 230 (Eng)	Analytical Chemistry Laboratory	0+3	3,0
KMH 213 (Eng)	Chemical Process Calculations	3+2	6,0
MAT 219 (Eng)	Differential Equations	2+2	4,5
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
			30,0

IV. SEMESTER

İST 201 (Eng)	Statistics	3+0	3,0
KİM 226 (Eng)	Physical Chemistry	3+0	4,0
KİM 231 (Eng)	Physical Chemistry Laboratory	0+3	3,0
MEK 317 (Eng)	Fluid Mechanics	4+0	5,0
NÜM 202 (Eng)	Linear Algebra and Numerical Methods	4+0	4,5
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
	Departmental Elective Courses (2)	-	8,5
			30,0

V. SEMESTER

İKT 356 (Eng)	Engineering Economics	3+0	4,5
KMH 310 (Eng)	Heat Transfer	4+0	5,0
KMH 317 (Eng)	Chemical Engineering Thermodynamics I	3+0	4,5
MLZ 203 (Eng)	Materials Science	3+0	3,5
	Departmental Elective Courses (3)	-	9,5
	Elective Courses (1)	-	3,0
			30,0

VI. SEMESTER

KMH 303 (Eng)	Mathematical Modeling in Chemical Engineering	4+0	5,0
KMH 308 (Eng)	Mass Transfer	4+0	5,0
KMH 314 (Eng)	Chemical Reaction Engineering I	4+0	5,0
KMH 318 (Eng)	Chemical Engineering Thermodynamics II (Kimya Mühendisliği Termodinamiği II)	3+0	4,5
	Departmental Elective Courses (1)	-	4,5
	Elective Courses (2)	-	6,0
			30,0

VII. SEMESTER

KMH 415 (Eng)	Process Dynamics and Control	4+0	5,0

VIII. SEMESTER

KMH 406 (Eng)	Separation Process	3+0	5,0
KMH 432 (Eng)	Chemical Engineering Design II	4+0	6,0

KMH 425	(Eng)	Chemical Reaction Engineering II	4+0	5,0
KMH 429	(Eng)	Special Topics in Chemical Engineering	1+2	4,0
KMH 431	(Eng)	Chemical Engineering Design I	4+0	6,0
KMH 435	(Eng)	Chemical Engineering Laboratory I	0+4	6,0
		Departmental Elective Courses (1)	-	4,0
				30,0

KMH 434	(Eng)	Chemical Engineering Applications	2+4	8,0
KMH 436	(Eng)	Chemical Engineering Laboratory II	0+4	6,0
		Departmental Elective Courses (1)	-	5,0
				30,0

DEPARTMENTAL ELECTIVE COURSES

KİM 436		Chemical Technologies	4+0	5,0
KMH 210		Instrumental Analysis	3+0	3,0
KMH 212	(Eng)	Computer Applications in Chemical Engineering	3+0	4,0
KMH 307	(Eng)	Experimental Design Techniques	3+0	4,0
KMH 316	(Eng)	Biotechnology	3+0	4,0
KMH 323		Biochemical Engineering Fundamentals	3+0	4,0
KMH 351		Sugar Technology	3+0	4,0
KMH 352		Water Technology	3+0	4,0
KMH 353		Air Pollution Removal Equipments	3+0	4,0
KMH 354		Boron Technology	3+0	4,0
KMH 355		Food Chemistry	3+0	4,0
KMH 356		Buble Column Technology	3+0	4,0
KMH 357	(Eng)	Electrochemistry	3+0	4,0
KMH 358	(Eng)	Measurement and Control in Chemical Processes	3+0	4,0
KMH 360	(Eng)	Carbon Materials	3+0	4,0
KMH 407		Fuel and Energy Technologies	3+0	4,0
KMH 409		Oil Technology	3+0	4,0
KMH 410		Coal Technologies	3+0	4,0
KMH 411		Polymer Technology	3+0	4,0
KMH 412		Petroleum Refinery Engineering	3+0	4,0
KMH 433		Industrial Equipments in Chemical Engineering	3+0	4,0
KMH 437	(Eng)	Alcohol Based Fuels	3+0	4,0
KMH 438	(Eng)	Computer Aided Design in Chemical Engineering	3+0	4,0
KMH 439	(Eng)	Catalytic Materials	3+0	4,0
KMH 440	(Eng)	Polymer Materials Science	3+0	4,0
KMH 441	(Eng)	Catalysis	3+0	4,0
KMH 451		Phase Equilibrium	3+0	4,0
KMH 452		Food Processing	3+0	4,0
KMH 453		Operations of Solid Particles	3+0	4,0
KMH 454		Heat Transfer Equipments	3+0	4,0
KMH 455		Food Additives	3+0	4,0
KMH 456		Occupational Health and Safety	3+0	4,0
KMH 457	(Eng)	Transport Phenomena	3+0	4,0
KMH 458	(Eng)	Chemical Process Optimization	3+0	4,0
KMH 460		Membrane Seperation Processes	3+0	4,0
KMH 462	(Eng)	Membrane Science and Technology	3+0	4,0
MÜH 302		Interdisciplinary Applications	1+2	4,5
MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5

ELECTIVE COURSES

ALM 255	(Ger)	German I	3+0	4,0
ALM 256	(Ger)	German II	3+0	4,0
ALM 357	(Ger)	German III	3+0	4,0
ALM 358	(Ger)	German IV	3+0	4,5
ARK 108		Archaeology	2+0	2,0
BEÖ 155		Physical Education	2+0	2,0
FOT 202		Photography	2+0	3,0
FRA 255	(Fra)	French I	3+0	4,0
FRA 256	(Fra)	French II	3+0	4,0
HUK 252		Labor Law	2+0	2,5
HUK 458		Industrial Rights and Technological Development	3+0	3,0
İKT 427		Industrial Economics	2+0	3,0
İLT 201		Interpersonal Communication	3+0	4,5
İSN 309		Mass Media	3+0	3,0
İSP 151	(Spa)	Spanish I	4+0	4,0
İSP 152	(Spa)	Spanish II	4+0	4,0
İŞL 101	(Eng)	Introduction to Business	3+0	4,5
İŞL 201	(Eng)	Business Organization	3+0	4,0
İŞL 321		Applied Entreprenneurship	3+1	5,0
İŞL 454	(Eng)	Management of Technology	3+0	4,5
İTA 255	(İta)	Italian I	3+0	4,0
İTA 256	(İta)	Italian II	3+0	4,0
KÜL 199		Cultural Activities	0+2	2,0
KÜL 451	(Eng)	History of Science and Engineering	3+0	4,5
MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
MÜH 404	(Eng)	Innovation Management	3+0	3,0
MÜZ 151		Short History of Music	2+0	3,0
MÜZ 157		Traditional Turkish Art Music	2+0	2,0
PSİ 102		Psychology	3+0	3,5
PZL 211	(Eng)	Principles of Marketing	3+0	5,0
PZL 302		Marketing Management	3+0	4,5
RUS 255	(Rus)	Russian I	3+0	4,0
RUS 256	(Rus)	Russian II	3+0	4,0
SNT 155		History of Art	2+0	2,0
SOS 154		Man and Sociology	2+0	3,0

THU 203	Community Services	0+2	3,0	TİY 308	Republic Era Turkish Theatre	2+0	3,0
TİY 121	Introduction to Theatre	2+0	3,0	TÜR 120	Turkish Sign Language	3+0	3,0
TİY 152	Theatre	2+0	2,5				

DEPARTMENT OF CHEMICAL ENGINEERING

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 transferreed 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. Based the data of 2016-2017 Academical Year,427 students have still been getting Chemical Engineering education which is provided by 4 Professors, 1 Associate Professor, 8 Assistant Professors and 9 Research Assistants.Quota per year is 70 students.% 30 of education language is English.

Head : Prof. Dr. Süleyman KAYTAKOĞLU
Deputy Head : Assoc. Prof. Dr. Esin APAYDIN VAROL
Deputy Head : S. Eren ÖCAL

PROGRAM

I. SEMESTER

FİZ 105	Physics I	4+0	6,0
FİZ 107	Physics Laboratory I	0+2	1,5
MAT 805	Calculus I	4+2	7,5
TRS 127	Technical Drawing	2+2	4,5
TÜR 125	Turkish Language I	2+0	2,0
KİM 117 (Eng)	General Chemistry I	4+0	6,0
KMH 105 (Eng)	Technical English	2+0	2,5
			30,0

II. SEMESTER

FİZ 106	Physics II	4+0	6,0
FİZ 108	Physics Laboratory II	0+2	1,5
MAT 806	Calculus II	4+2	7,5
TÜR 126	Turkish Language II	2+0	2,0
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
KİM 118 (Eng)	General Chemistry II	4+0	6,0
KMH 108 (Eng)	Introduction to Chemical Engineering	2+0	3,5
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

KİM 208	Organic Chemistry	3+0	4,0
KİM 211	Analytical Chemistry	3+0	3,0
KİM 230	Analytical Chemistry Laboratory	0+3	3,0
MAT 219	Differential Equations	2+2	4,5
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
BİL 813 (Eng)	Computer Programming in Engineering	2+2	4,5
İKT 151 (Eng)	Economics	3+0	3,0
KMH 213 (Eng)	Chemical Process Calculations	3+2	6,0
			30,0

IV. SEMESTER

İST 201	Statistics	3+0	3,0
KİM 226	Physical Chemistry	3+0	4,0
KİM 231	Physical Chemistry Laboratory	0+3	3,0
MEK 317	Fluid Mechanics	4+0	5,0
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
NÜM 202 (Eng)	Linear Algebra and Numerical Methods	4+0	4,5
	Departmental Elective Courses (2)	-	8,5
			30,0

V. SEMESTER

KMH 310	Heat Transfer	4+0	5,0
KMH 317	Chemical Engineering Thermodynamics I	3+0	4,5
MLZ 203	Materials Science	3+0	3,5

VI. SEMESTER

KMH 308	Mass Transfer	4+0	5,0
KMH 318	Chemical Engineering Thermodynamics II	3+0	4,5

İKT 356	(Eng)	Engineering Economics	3+0	4,5
		Departmental Elective Courses (3)	-	9,5
		Elective Courses (1)	-	3,0
				30,0

KMH 303	(Eng)	Mathematical Modeling in Chemical Engineering	4+0	5,0
KMH 314	(Eng)	Chemical Reaction Engineering I	4+0	5,0
		Departmental Elective Courses (1)	-	4,5
		Elective Courses (2)	-	6,0
				30,0

VII. SEMESTER

KMH 415		Process Dynamics and Control	4+0	5,0
KMH 429		Special Topics in Chemical Engineering	1+2	4,0
KMH 435		Chemical Engineering Laboratory I	0+4	6,0
KMH 425	(Eng)	Chemical Reaction Engineering II	4+0	5,0
KMH 431	(Eng)	Chemical Engineering Design I	4+0	6,0
		Departmental Elective Courses (1)	-	4,0
				30,0

VIII. SEMESTER

KMH 434		Chemical Engineering Applications	2+4	8,0
KMH 436		Chemical Engineering Laboratory II	0+4	6,0
KMH 406	(Eng)	Separation Process	3+0	5,0
KMH 432	(Eng)	Chemical Engineering Design II	4+0	6,0
		Departmental Elective Courses (1)	-	5,0
				30,0

DEPARTMENTAL ELECTIVE COURSES

KİM 282		Organic Chemistry Laboratory	0+3	3,0
KİM 457		Chemical Technologies I	3+0	4,0
KİM 458		Chemical Technologies II	3+0	4,0
KMH 210		Instrumental Analysis	3+0	3,0
KMH 212		Computer Applications in Chemical Engineering	3+0	4,0
KMH 307		Experimental Design Techniques	3+0	4,0
KMH 313		Biorefinery Processes	3+0	4,0
KMH 316	(Eng)	Biotechnology	3+0	4,0
KMH 323		Biochemical Engineering Fundamentals	3+0	4,0
KMH 351		Sugar Technology	3+0	4,0
KMH 352		Water Technology	3+0	4,0
KMH 353		Air Pollution Removal Equipments	3+0	4,0
KMH 354		Boron Technology	3+0	4,0
KMH 355		Food Chemistry	3+0	4,0
KMH 356		Buble Column Technology	3+0	4,0
KMH 357		Electrochemistry	3+0	4,0
KMH 358		Measurement and Control in Chemical Processes	3+0	4,0
KMH 360	(Eng)	Carbon Materials	3+0	4,0
KMH 407		Fuel and Energy Technologies	3+0	4,0
KMH 409		Oil Technology	3+0	4,0
KMH 410		Coal Technologies	3+0	4,0
KMH 411		Polymer Technology	3+0	4,0
KMH 412		Petroleum Refinery Engineering	3+0	4,0
KMH 433		Industrial Equipments in Chemical Engineering	3+0	4,0
KMH 437	(Eng)	Alcohol Based Fuels	3+0	4,0
KMH 438	(Eng)	Computer Aided Design in Chemical Engineering	3+0	4,0
KMH 439	(Eng)	Catalytic Materials	3+0	4,0
KMH 440	(Eng)	Polymer Materials Science	3+0	4,0
KMH 441	(Eng)	Catalysis	3+0	4,0
KMH 451		Phase Equilibrium	3+0	4,0
KMH 452		Food Processing	3+0	4,0
KMH 453		Operations of Solid Particles	3+0	4,0
KMH 454		Heat Transfer Equipments	3+0	4,0
KMH 455		Food Additives	3+0	4,0
KMH 456		Occupational Health and Safety	3+0	4,0
KMH 457	(Eng)	Transport Phenomena	3+0	4,0
KMH 458		Chemical Process Optimization	3+0	4,0
KMH 460		Membrane Seperation Processes	3+0	4,0
KMH 462	(Eng)	Membrane Science and Technology	3+0	4,0
MÜH 302		Interdisciplinary Applications	1+2	4,5
MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5

ELECTIVE COURSES

ALM 255	(Ger)	German I	3+0	4,0
ALM 256	(Ger)	German II	3+0	4,0
ALM 357	(Ger)	German III	3+0	4,0
ALM 358	(Ger)	German IV	3+0	4,5
ARK 108		Archaeology	2+0	2,0
BEÖ 155		Physical Education	2+0	2,0
FOT 202		Photography	2+0	3,0
FRA 255	(Fra)	French I	3+0	4,0
FRA 256	(Fra)	French II	3+0	4,0
HUK 252		Labor Law	2+0	2,5
HUK 458		Industrial Rights and Technological Development	3+0	3,0

İKT 427	Industrial Economics	2+0	3,0
İLT 201	Interpersonal Communication	3+0	4,5
İSN 309	Mass Media	3+0	3,0
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 101 (Eng)	Introduction to Business	3+0	4,5
İŞL 201 (Eng)	Business Organization	3+0	4,0
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
KÜL 451 (Eng)	History of Science and Engineering	3+0	4,5
MÜH 402 (Eng)	Engineering Ethics	2+0	3,0
MÜH 404 (Eng)	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
PZL 211 (Eng)	Principles of Marketing	3+0	5,0
PZL 302	Marketing Management	3+0	4,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 154	Man and Sociology	2+0	3,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF CIVIL ENGINEERING (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 bycle 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 department is located at the Iki Eylul Campus and occupies a covered area of 5000 m2. 4 Professors,4 Associate Professors, 6 Assistant Professors and 11 Research Assistants currently working in the 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.

Head : Prof. Dr. Recep BAKIŞ
Deputy Head : Mehmet İnanç ONUR
Deputy Head : Kıvanç TAŞKIN

PROGRAM

I. SEMESTER

TÜR 125	Turkish Language I	2+0	2,0
FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
İNG 250 (Eng)	Reading and Speaking in English	2+0	2,0
İNŞ 101 (Eng)	Introduction to Civil Engineering	2+0	3,5
KİM 113 (Eng)	General Chemistry	4+0	6,0
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
MAT 805 (Eng)	Calculus I	4+2	7,5
			30,0

II. SEMESTER

TÜR 126	Turkish Language II	2+0	2,0
BİL 810 (Eng)	Computer Applications in Civil Engineering	2+2	4,5
FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
İNG 360 (Eng)	English for Business	2+0	2,0
MAT 806 (Eng)	Calculus II	4+2	7,5
TRS 110 (Eng)	Technical Drawing in Civil Engineering	2+2	4,5
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
İNŞ 239 (Eng)	Law and Ethics in Civil Engineering	3+0	3,0
İNŞ 241 (Eng)	Materials Science in Civil Engineering	3+0	5,0
İST 201 (Eng)	Statistics	3+0	3,0
MAT 219 (Eng)	Differential Equations	2+2	4,5
MEK 201 (Eng)	Statics	3+0	5,0
NÜM 202 (Eng)	Linear Algebra and Numerical Methods	4+0	4,5
	Elective Courses (1)	-	3,0
			30,0

IV. SEMESTER

TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
İKT 356 (Eng)	Engineering Economics	3+0	4,5
İNŞ 238 (Eng)	Introduction to Transportation Planning	2+0	3,5
İNŞ 308 (Eng)	Hydrology	3+0	4,5
MEK 206 (Eng)	Dynamics	3+0	4,5
MEK 212 (Eng)	Strength of Materials I	3+2	6,0
MLZ 204 (Eng)	Materials of Construction	3+2	5,0
			30,0

V. SEMESTER

İNŞ 307 (Eng)	Structural Analysis I	3+2	6,0
İNŞ 309 (Eng)	Soil Mechanics I	3+2	6,0
İNŞ 311 (Eng)	Transportation Engineering I	3+2	6,0
İNŞ 312 (Eng)	Construction Engineering and Management	3+0	4,5
MEK 307 (Eng)	Fluid Mechanics	3+0	4,5
	Elective Courses (1)	-	3,0
			30,0

VI. SEMESTER

İNŞ 302 (Eng)	Reinforced Concrete I	3+2	6,0
İNŞ 316 (Eng)	Steel Structures	3+2	6,0
İNŞ 318 (Eng)	Hydraulics	3+0	4,5
İNŞ 342 (Eng)	Foundation Engineering I	3+0	4,5
	Departmental Elective Courses (2)	-	9,0
			30,0

VII. SEMESTER

İSG 401	Occupational Health and Safety I	2+0	2,0
İNŞ 413 (Eng)	Civil Engineering Design	3+2	4,0
İNŞ 415 (Eng)	Special Topics in Civil Engineering	2+2	3,0
	Departmental Elective Courses (4)	-	18,0
	Elective Courses (1)	-	3,0
			30,0

VIII. SEMESTER

İSG 402	Occupational Health and Safety II	2+0	2,0
İNŞ 414 (Eng)	Applications of Design in Civil Engineering	2+4	5,5
	Departmental Elective Courses (5)	-	22,5
			30,0

DEPARTMENTAL ELECTIVE COURSES

BİL 473 (Eng)	Foundation Engineering and Computer Applications	3+0	4,5
İNŞ 314 (Eng)	Structural Analysis II	3+0	4,5
İNŞ 401 (Eng)	Reinforced Concrete Project	3+0	4,5
İNŞ 407 (Eng)	Reinforced Concrete II	3+0	4,5
İNŞ 409 (Eng)	Pavement Design	3+0	4,5
İNŞ 411 (Eng)	Transportation Engineering II	3+0	4,5
İNŞ 451 (Eng)	Geographic Information Systems (GIS) Applications in Hydrology and Hydraulics	2+2	4,5
İNŞ 452 (Eng)	Computer Applications in Hydrology and Hydraulics	2+2	4,5
İNŞ 453 (Eng)	Railway Engineering	3+0	4,5
İNŞ 454 (Eng)	Earthquake Analysis of Structures	3+0	4,5
İNŞ 455 (Eng)	Highway Design	2+2	4,5
İNŞ 456 (Eng)	Ground Water Hydrology	3+0	4,5
İNŞ 457 (Eng)	Construction Cost Design	2+2	4,5
İNŞ 458 (Eng)	Testing of Concrete	3+0	4,5
İNŞ 459 (Eng)	Geotechnical Design	2+2	4,5
İNŞ 460 (Eng)	Admixture for Concrete	3+0	4,5
İNŞ 461 (Eng)	Structural Design for Reinforced Concrete Buildings	2+2	4,5
İNŞ 462 (Eng)	Properties of Fresh and Hardened Concrete	3+0	4,5
İNŞ 463 (Eng)	Hydraulic Design	2+2	4,5
İNŞ 464 (Eng)	Concrete Durability	3+0	4,5
İNŞ 465 (Eng)	Steel Structural Design	2+2	4,5
İNŞ 466 (Eng)	Stell Structure Project	3+0	4,5
İNŞ 467 (Eng)	Construction Equipments	3+0	4,5
İNŞ 468 (Eng)	Computer-Based Project Management	3+0	4,5
İNŞ 469 (Eng)	Renewable Energy with Water, Wind and Wave Power	3+0	4,5
İNŞ 470 (Eng)	Concrete Technology	3+0	4,5
İNŞ 471 (Eng)	Numerical Modeling in Hydrology and Hydraulics	2+2	4,5

İNŞ 472 (Eng)	Introduction Traffic Engineering	3+0	4,5
İNŞ 474 (Eng)	Tunnels	3+0	4,5
İNŞ 476 (Eng)	Project Planning with Primavera and MS Project	3+0	4,5
İNŞ 478 (Eng)	Construction Cost Analysis And Estimating	3+0	4,5
İNŞ 480 (Eng)	Concrete Making Materials	3+0	4,5
İNŞ 481 (Eng)	Soil Mechanics II	3+0	4,5
İNŞ 482 (Eng)	Ground Improvement	3+0	4,5
İNŞ 483 (Eng)	Retaining Structures	3+0	4,5
İNŞ 484 (Eng)	Foundation Engineering II	3+0	4,5
İNŞ 485 (Eng)	Irrigation and Drainage	3+0	4,5
İNŞ 486 (Eng)	Introduction to Soil Dynamics	3+0	4,5
İNŞ 487 (Eng)	Water Structures	3+0	4,5
İNŞ 488 (Eng)	Environmental Geotechnology	3+0	4,5
İNŞ 489 (Eng)	Open Channel Hydraulics	3+0	4,5
İNŞ 490 (Eng)	Coastal and Port Engineering	3+0	4,5
İNŞ 492 (Eng)	Water Resources Engineering	3+0	4,5
İNŞ 494 (Eng)	Construction in Civil Engineering	3+0	4,5
İNŞ 495 (Eng)	Highway Pavements	3+0	4,5
İNŞ 496 (Eng)	Construction Planning and Management	3+0	4,5
İNŞ 498 (Eng)	Introduction to Structural Dynamics	3+0	4,5
JEO 201 (Eng)	Engineering Geology	3+0	4,5
MEK 403 (Eng)	Strength of Materials II	3+0	4,5
MÜH 302 (Eng)	Interdisciplinary Applications	1+2	4,5
TOP 102 (Eng)	Surveying	2+2	4,5

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ALM 357 (Ger)	German III	3+0	4,0
ALM 358 (Ger)	German IV	3+0	4,5
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
HUK 252	Labor Law	2+0	2,5
HUK 458	Industrial Rights and Technological Development	3+0	3,0
İKT 151 (Eng)	Economics	3+0	3,0
İLT 201 (Eng)	Interpersonal Communication	3+0	4,5
İSN 309	Mass Media	3+0	3,0
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 101 (Eng)	Introduction to Business	3+0	4,5
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
KÜL 451 (Eng)	History of Science and Engineering	3+0	4,5
MÜH 402 (Eng)	Engineering Ethics	2+0	3,0
MÜH 404 (Eng)	Innovation Management	3+0	3,0
MÜZ 101	Evolution of Music	2+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 154	Man and Sociology	2+0	3,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF CIVIL ENGINEERING

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 bycle 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 department is located at the Iki Eylul Campus and occupies a covered area of 5000 m2. 4 Professors,4 Associate Professors, 6 Assistant Professors and 11 Research Assistants currently working in the 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.

Head : Prof. Dr. Recep BAKIŞ

Deputy Head : Mehmet İnanç ONUR

Deputy Head : Kıvanç TAŞKIN

PROGRAM

I. SEMESTER

FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
İNG 250 (Eng)	Reading and Speaking in English	2+0	2,0
İNŞ 101	Introduction to Civil Engineering	2+0	3,5
KİM 113	General Chemistry	4+0	6,0
KİM 115	General Chemistry Laboratory	0+2	1,5
MAT 805	Calculus I	4+2	7,5
TÜR 125	Turkish Language I	2+0	2,0
			30,0

II. SEMESTER

BİL 810	Computer Applications in Civil Engineering	2+2	4,5
FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
İNG 360 (Eng)	English for Business	2+0	2,0
MAT 806	Calculus II	4+2	7,5
TRS 110	Technical Drawing in Civil Engineering	2+2	4,5
TÜR 126	Turkish Language II	2+0	2,0
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

İNŞ 239	Law and Ethics in Civil Engineering	3+0	3,0
İNŞ 241 (Eng)	Materials Science in Civil Engineering	3+0	5,0
İST 201 (Eng)	Statistics	3+0	3,0
MAT 219	Differential Equations	2+2	4,5
MEK 201 (Eng)	Statics	3+0	5,0
NÜM 202	Linear Algebra and Numerical Methods	4+0	4,5
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
	Elective Courses (1)	-	3,0
			30,0

IV. SEMESTER

İKT 356 (Eng)	Engineering Economics	3+0	4,5
İNŞ 238 (Eng)	Introduction to Transportation Planning	2+0	3,5
İNŞ 308 (Eng)	Hydrology	3+0	4,5
MEK 206 (Eng)	Dynamics	3+0	4,5
MEK 212 (Eng)	Strength of Materials I	3+2	6,0
MLZ 204	Materials of Construction	3+2	5,0
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
			30,0

V. SEMESTER

İNŞ 307 (Eng)	Structural Analysis I	3+2	6,0
İNŞ 309 (Eng)	Soil Mechanics 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
MEK 307	Fluid Mechanics	3+0	4,5
	Elective Courses (1)	-	3,0
			30,0

VI. SEMESTER

İNŞ 302	Reinforced Concrete I	3+2	6,0
İNŞ 316	Steel Structures	3+2	6,0
İNŞ 318 (Eng)	Hydraulics	3+0	4,5
İNŞ 342	Foundation Engineering I	3+0	4,5
	Departmental Elective Courses (2)	-	9,0
			30,0

VII. SEMESTER

İNŞ 413	Civil Engineering Design	3+2	4,0
İNŞ 415	Special Topics in Civil Engineering	2+2	3,0
İSG 401	Occupational Health and Safety I	2+0	2,0
	Departmental Elective Courses (4)	-	18,0
	Elective Courses (1)	-	3,0
			30,0

VIII. SEMESTER

İNŞ 414	Applications of Design in Civil Engineering	2+4	5,5
İSG 402	Occupational Health and Safety II	2+0	2,0
	Departmental Elective Courses (5)	-	22,5
			30,0

DEPARTMENTAL ELECTIVE COURSES

BİL 473	Foundation Engineering and Computer Applications	3+0	4,5
İNŞ 310	Water Supply and Sewerage	3+2	4,5
İNŞ 314 (Eng)	Structural Analysis II	3+0	4,5
İNŞ 401	Reinforced Concrete Project	3+0	4,5

İNŞ 407	Reinforced Concrete II	3+0	4,5
İNŞ 409	Pavement Design	3+0	4,5
İNŞ 411	Transportation Engineering II	3+0	4,5
İNŞ 451 (Eng)	Geographic Information Systems (GIS) Applications in Hydrology and Hydraulics	2+2	4,5
İNŞ 452 (Eng)	Computer Applications in Hydrology and Hydraulics	2+2	4,5
İNŞ 453	Railway Engineering	3+0	4,5
İNŞ 454	Earthquake Analysis of Structures	3+0	4,5
İNŞ 455	Highway Design	2+2	4,5
İNŞ 456	Ground Water Hydrology	3+0	4,5
İNŞ 457	Construction Cost Design	2+2	4,5
İNŞ 458	Testing of Concrete	3+0	4,5
İNŞ 459	Geotechnical Design	2+2	4,5
İNŞ 460	Admixture for Concrete	3+0	4,5
İNŞ 461	Structural Design for Reinforced Concrete Buildings	2+2	4,5
İNŞ 462	Properties of Fresh and Hardened Concrete	3+0	4,5
İNŞ 463	Hydraulic Design	2+2	4,5
İNŞ 464	Concrete Durability	3+0	4,5
İNŞ 465	Steel Structural Design	2+2	4,5
İNŞ 466 (Eng)	Stell Structure Project	3+0	4,5
İNŞ 467 (Eng)	Construction Equipments	3+0	4,5
İNŞ 468	Computer-Based Project Management	3+0	4,5
İNŞ 469 (Eng)	Renewable Energy with Water, Wind and Wave Power	3+0	4,5
İNŞ 470	Concrete Technology	3+0	4,5
İNŞ 471 (Eng)	Numerical Modeling in Hydrology and Hydraulics	2+2	4,5
İNŞ 472	Introduction to Traffic	3+0	4,5
İNŞ 473	Tımber Structures	3+0	4,5
İNŞ 474	Tunnels	3+0	4,5
İNŞ 475	Multi-Story Steel Structure Design	3+0	4,5
İNŞ 476	Project Planning with Primavera and MS Project	3+0	4,5
İNŞ 478	Construction Cost Analysis and Estimating	3+0	4,5
İNŞ 480	Concrete Making Materials	3+0	4,5
İNŞ 481	Soil Mechanics II	3+0	4,5
İNŞ 482	Ground Improvement	3+0	4,5
İNŞ 483	Retaining Structures	3+0	4,5
İNŞ 484	Foundation Engineering II	3+0	4,5
İNŞ 485	Irrigation and Drainage	3+0	4,5
İNŞ 486	Introduction to Soil Dynamics	3+0	4,5
İNŞ 487	Water Structures	3+0	4,5
İNŞ 488	Environmental Geotechnology	3+0	4,5
İNŞ 489 (Eng)	Open Channel Hydraulics	3+0	4,5
İNŞ 490	Coastal and Port Engineering	3+0	4,5
İNŞ 492	Water Resources Engineering	3+0	4,5
İNŞ 494	Civil Engineering Construction	3+0	4,5
İNŞ 495	Highway Pavements	3+0	4,5
İNŞ 496 (Eng)	Construction Planning and Management	3+0	4,5
İNŞ 498 (Eng)	Introduction to Structural Dynamics	3+0	4,5
JEO 201	Engineering Geology	3+0	4,5
MEK 403 (Eng)	Strength of Materials II	3+0	4,5
MÜH 302	Interdisciplinary Applications	1+2	4,5
TOP 102	Surveying	2+2	4,5

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
HUK 252	Labor Law	2+0	2,5
HUK 458	Industrial Rights and Technological Development	3+0	3,0
İKT 151	Economics	3+0	3,0
İLT 201 (Eng)	Interpersonal Communication	3+0	4,5
İSN 309	Mass Media	3+0	3,0
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
KÜL 451 (Eng)	History of Science and Engineering	3+0	4,5
MÜH 402 (Eng)	Engineering Ethics	2+0	3,0
MÜH 404 (Eng)	Innovation Management	3+0	3,0
MÜZ 101	Evolution of Music	2+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 154	Man and Sociology	2+0	3,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF COMPUTER ENGINEERING (ENGLISH)

The Department was established in 1993. The department is located at the Iki Eylul Campus and occupies a covered area of 5000 m2. 1 Professors, 2 Associate Professor, 3 Assistant Professors, 4 Instructors and 7 Research Assistants are currently working in the 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 one deputy chairmen. Department of Computer Engineering leading to an undergraduate degree started in the 2000-2001 academic year. As every year 40 students are planned to be accepted to the program, the medium of instruction is English.

Head : Prof. Dr. Yaşar HOŞCAN

Deputy Head : Alper Kürşat UYSAL

PROGRAM

I. SEMESTER

TÜR 125		Turkish Language I	2+0	2,0
BİM 101	(Eng)	Computer Programming I	3+2	7,0
FİZ 105	(Eng)	Physics I	4+0	6,0
FİZ 107	(Eng)	Physics Laboratory I	0+2	1,5
KİM 113	(Eng)	General Chemistry	4+0	6,0
MAT 805	(Eng)	Calculus I	4+2	7,5
				30,0

II. SEMESTER

TÜR 126		Turkish Language II	2+0	2,0
BİM 102	(Eng)	Computer Programming II	3+0	6,0
BİM 122	(Eng)	Discrete Computational Structures	3+0	5,0
FİZ 106	(Eng)	Physics II	4+0	6,0
FİZ 108	(Eng)	Physics Laboratory II	0+2	1,5
MAT 806	(Eng)	Calculus II	4+2	7,5
		Elective Courses (1)	-	2,0
				30,0

III. SEMESTER

TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
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
BİM 213	(Eng)	Data Structures and Algorithms	2+2	5,5
MAT 249	(Eng)	Linear Algebra and Differential Equations	3+0	4,5
				30,0

IV. SEMESTER

TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
BİM 204	(Eng)	Numeric Analysis for Computer Engineers	3+0	3,5
BİM 208	(Eng)	Computer Programming IV	3+0	5,5
BİM 222	(Eng)	Internet Programming	3+0	4,5
BİM 312	(Eng)	Database Management Systems	3+0	6,0
BİM 314	(Eng)	Theory of Computation	3+0	4,5
İST 252	(Eng)	Probability and Statistics	3+0	4,0
				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
BİM 313	(Eng)	Advanced Programming Techniques	3+2	6,0
		Departmental Elective Courses (1)	-	4,5
		Elective Courses (1)	-	3,0
				30,0

VI. SEMESTER

BİM 302	(Eng)	Computer Networks	3+0	4,5
BİM 304	(Eng)	Computer Algorithm Design	3+0	6,0
BİM 306	(Eng)	Operating Systems	3+0	4,5
BİM 308	(Eng)	Web Server Programming	3+0	6,0
		Departmental Elective Courses (1)	-	4,5
		Elective Courses (1)	-	4,5
				30,0

VII. SEMESTER

İSG 401		Occupational Health and Safety I	2+0	2,0
BİM 437	(Eng)	Computer Engineering Design	1+2	4,0
		Departmental Elective Courses (4)	-	18,0
		Elective Courses (2)	-	6,0
				30,0

VIII. SEMESTER

İSG 402		Occupational Health and Safety II	2+0	2,0
BİM 444	(Eng)	Computer Engineering Applications	2+4	7,0
		Departmental Elective Courses (4)	-	18,0
		Elective Courses (1)	-	3,0
				30,0

DEPARTMENTAL ELECTIVE COURSES

BİM 309	(Eng)	Artificial Intelligence	3+0	4,5
BİM 405	(Eng)	Project Management	3+0	4,5
BİM 423	(Eng)	Software Engineering	3+2	6,0
BİM 439	(Eng)	Applications of Database Management Systems	3+0	4,5
BİM 441	(Eng)	Introduction to Rough Sets Theory	3+0	4,5
BİM 446	(Eng)	Analysis of Algorithms	3+0	4,5
BİM 448	(Eng)	Computer Graphics	3+0	4,5
BİM 450	(Eng)	Network Management	3+0	4,5
BİM 451	(Eng)	Web Server Programming with MVC	3+0	4,5
BİM 452	(Eng)	Multimedia Computing	3+0	4,5
BİM 453	(Eng)	Introduction to Machine Learning	3+0	4,5
BİM 454	(Eng)	Programming Language Concepts	3+0	4,5
BİM 455	(Eng)	Introduction to Hardware Design	3+0	4,5
BİM 456	(Eng)	Network Security Principles	3+0	4,5
BİM 457	(Eng)	Embedded Programming Languages	3+0	4,5
BİM 458	(Eng)	Simulation and Modeling	3+0	4,5
BİM 460	(Eng)	Software Modeling	3+0	4,5
BİM 462	(Eng)	Parallel Systems	3+0	4,5
BİM 464	(Eng)	Human-Computer Interaction	3+0	4,5
BİM 466	(Eng)	Fuzzy Logic	3+0	4,5
BİM 468	(Eng)	Computer Aided Design	3+0	4,5
BİM 470	(Eng)	Neural Networks	3+0	4,5
BİM 472	(Eng)	Image Processing	3+0	4,5
BİM 474	(Eng)	Introduction to Cryptography	3+0	4,5
BİM 476	(Eng)	Data Acquisition and Processing	3+0	4,5
BİM 478	(Eng)	Management Information Systems	3+0	4,5
BİM 480	(Eng)	Compiler Design	3+0	4,5
BİM 482	(Eng)	Network Programming	3+0	4,5
BİM 484	(Eng)	Distributed Systems	3+0	4,5
BİM 485	(Eng)	Research in Computer Science I	3+0	4,5
BİM 486	(Eng)	Research in Computer Science II	3+0	4,5
BİM 488	(Eng)	Introduction to Pattern Recognition	3+0	4,5
BİM 490	(Eng)	Introduction to Information Retrieval	3+0	4,5
BİM 492	(Eng)	Design Patterns	3+0	4,5
BİM 493	(Eng)	Mobile Programming I	3+0	4,5
BİM 494	(Eng)	Mobile Programming II	3+0	4,5
BİM 496	(Eng)	Computer Vision	3+0	4,5
BİM 498	(Eng)	Embedded Software Design	3+0	4,5
EEM 305	(Eng)	Signals and Systems	3+0	4,5
EEM 334	(Eng)	Digital Systems II	3+0	5,0
EEM 463	(Eng)	Introduction to Image Processing	3+0	5,0
ENM 440	(Eng)	Introduction to Data Mining	3+0	4,5
MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5

ELECTIVE COURSES

ALM 255	(Ger)	German I	3+0	4,0
ALM 256	(Ger)	German II	3+0	4,0
ALM 357	(Ger)	German III	3+0	4,0
ALM 358	(Ger)	German IV	3+0	4,5
ARK 108		Archaeology	2+0	2,0
BEÖ 155		Physical Education	2+0	2,0
BİM 411	(Eng)	Decision Support Systems	3+0	3,0
FOT 202		Photography	2+0	3,0
FRA 255	(Fra)	French I	3+0	4,0
FRA 256	(Fra)	French II	3+0	4,0
HUK 458		Industrial Rights and Technological Development	3+0	3,0
İKT 151	(Eng)	Economics	3+0	3,0
İKT 356	(Eng)	Engineering Economics	3+0	4,5
İLT 201	(Eng)	Interpersonal Communication	3+0	4,5
İSN 309	(Eng)	Mass Media	3+0	3,0
İSP 151	(Spa)	Spanish I	4+0	4,0
İSP 152	(Spa)	Spanish II	4+0	4,0
İŞL 101	(Eng)	Introduction to Business	3+0	4,5
İŞL 301	(Eng)	Human Resources Management	3+0	4,0
İŞL 321		Applied Entreprenneurship	3+1	5,0
İTA 255	(İta)	Italian I	3+0	4,0
İTA 256	(İta)	Italian II	3+0	4,0
KÜL 199		Cultural Activities	0+2	2,0
MUH 151	(Eng)	Introduction to Accounting	3+0	4,5
MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
MÜH 404	(Eng)	Innovation Management	3+0	3,0
MÜZ 151		Short History of Music	2+0	3,0
MÜZ 157		Traditional Turkish Art Music	2+0	2,0
NÜM 301	(Eng)	Numerical Methods	3+0	3,5
PSİ 102	(Eng)	Psychology	3+0	3,5
PZL 302	(Eng)	Marketing Management	3+0	4,5
RUS 255	(Rus)	Russian I	3+0	4,0
RUS 256	(Rus)	Russian II	3+0	4,0
SNT 155		History of Art	2+0	2,0
THU 203		Community Services	0+2	3,0
TİY 121		Introduction to Theatre	2+0	3,0
TİY 152		Theatre	2+0	2,5
TİY 308		Republic Era Turkish Theatre	2+0	3,0
TÜR 120		Turkish Sign Language	3+0	3,0

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING (ENGLISH)

ABOUT THE DEPARTMENT 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. Presently there are 4 professors, 4 associate professors, and 5 assistant professors, adding up to thirteen full-time faculty members accompanied by 13 associates working with the department. Furthermore, some faculty members from other departments in our university and from other universities also work as adjunct faculty members in our department. The undergraduate program (leading to the B.S. degree) in our department has started in the 1997-1998 academic year. Currently there are about 380 undergraduates studying in the department including the 62 students in the English prepatory classes. The language of the instruction in the undergraduate program is English. Graduate education (leading to M.S. and Ph.D. degrees) with specializations in systems and control theory, digital systems, power electronics, and signal and image processing and recognition, computer networks and architecture is being offered since the 1994-95 academic year.Currently, there are over 30 graduate students studying in the department. A number of research projects, funded by various organizations such as the Scientific and Technical Research Council of Turkey and the State Planning Organization of Turkey and by the University Research Fund are being conducted or have recently been completed in the department. In our department which is housed in three blocks, totaling 5567 m2 closed surface area, there are nine laboratories, from Electrical Circuits and Measurements laboratory to Advanced Control Systems and Robotics laboratory, which are fully equipped and are being used for education and research. Each academic staff member of the department has a personal computer for his/her own exclusive use provided by the university. A computer laboratory equipped with 30 personal computers, which are connected to the Internet, is open to our students. In addition, in the other laboratories of our department there are many personal computers for the use of the department staff and students. Academic staff and students of the department may also use the computer facilities of the Faculty of Engineering and Architecture and of the Anadolu University Computing Center. PROGRAMS OFFERED The department offers Bachelor of Science (BS), Master of Science (MS) and Doctorate of Philosophy (PhD) programs . The degrees from postgraduate programs are awarded by the Graduate School of Sciences. For M.S. and Ph.D. programs, the university and department announce their requirements for selecting students. Certain exams may be applied to the applicants before they can be placed to M.S. and Ph.D. programs. B.S. (Bachelor of Science) For B.S. (Bachelor of Science), students are selected by National University Entrance Examination (Student Placement Exam, OSS). About 62 students are admitted each year. Normal duration is 4 years excluding the English preparatory school. Students must take and pass all necessary courses and reach a minimum GPA (Grade Point Average) of 2.00 before graduation. The official language of instruction is English. Students who fail to pass an English language level determination test must attend a one-year English preparatory school and pass it before proceeding with the department courses. Besides regular lectures during fall and spring semesters that should lead to a minimum of 240 ECTS credits, all B.S. students are required to perform summer practice as a part of graduation requirements. They must complete a summer practice of at least 40 working days. A report prepared at the end of summer practice should reflect both the practical experience and the knowledge gained in the practice taken during the engineering education. M.S. - with thesis (Master of Science - with thesis) Attendents of this program are required to take 7 courses and 1 seminar. After that, they are required to prepare and orally defend a thesis based on their research. The students normally need 2 years to complete the program. The program is intended to raise students that are more academically and research oriented. M.S.- without thesis (Master of Science - without thesis) Students that attend this program need to take 10 courses and 1 project. The program takes approximately 1.5 - 2 years to complete. This program is intended more for students who want to specialize in industrial topics or to improve their knowledge about more advanced topics. Ph.D. (Doctorate of Philosophy)The Doctorate degree requires course work and thesis research. The students will conduct original research and prepare a thesis, then make an oral defense of their completed research. Students require about four years beyond the Master's degree to complete a Ph.D. program. OUR VISION, MISSION, and FUNDAMENTAL VALUES OUR VISION Our vision is to become a prestigious department that will be ranking one among the top national and international electrical-electronics engineering departments in terms of education, research, and research applications. OUR MISSION With our powerful technologic infra structure capabilities, to provide our students the education so that they will have all the knowledge and capability required by the electrical-electronics engineering profession, be able to use this knowledge and capability for the benefit of the humanity, be able to renew themselves continuously, have the professional and ethical responsibility, be modern and creative, have the project development ability, be highly socially conscientious engineers; to do research and disseminate results in electrical-electronics fields where the research may contribute to the knowledge and technological progress needed by the society. OUR FUNDAMENTAL VALUES hardworking and organized, self confident, honest and reliable, visionary and open minded, valueing the students and the staff, innovative, conscientious for the team work, having principles of seeking, aquiring, producing, and disseminating the information, progressing and renovating, having professional ethical values.

Head : Prof. Dr. Atakan DOĞAN
Deputy Head : Assoc. Prof. Dr. Tansu FİLİK
Deputy Head : Şener AĞALAR

PROGRAM

I. SEMESTER

TÜR 125	Turkish Language I	2+0	2,0
BİM 122 (Eng)	Discrete Computational Structures	3+0	5,0
FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
KİM 113 (Eng)	General Chemistry	4+0	6,0
MAT 805 (Eng)	Calculus I	4+2	7,5
	Elective Courses (1)	-	2,0
			30,0

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
FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
MAT 251 (Eng)	Linear Algebra	3+0	4,5
MAT 806 (Eng)	Calculus II	4+2	7,5
			30,0

III. SEMESTER

TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
BİL 200 (Eng)	Computer Programming	2+2	6,0
EEM 206 (Eng)	Electrical Circuits Laboratory	1+2	3,0
EEM 209 (Eng)	Circuit Analysis	4+1	7,5
MAT 219 (Eng)	Differential Equations	2+2	4,5
MAT 247 (Eng)	Engineering Mathematics (Mühendislik Matematiği)	4+0	7,0
			30,0

IV. SEMESTER

TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
TÜR 126	Turkish Language II	2+0	2,0
EEM 208 (Eng)	Electromagnetic Fields and Waves	4+0	7,0
EEM 210 (Eng)	Fundamentals of Semiconductor Device	3+0	5,0
EEM 232 (Eng)	Digital Systems I	4+0	7,0
EEM 238 (Eng)	Digital Systems Laboratory	0+2	2,0
İST 244 (Eng)	Engineering Probability	3+0	5,0
			30,0

V. SEMESTER

EEM 301 (Eng)	Signals and Systems	4+0	7,0
EEM 311 (Eng)	Principles of Energy Conversion	3+2	7,0
EEM 321 (Eng)	Electronics I	3+0	5,0
EEM 328 (Eng)	Electronics Laboratory	1+2	3,0
İKT 151 (Eng)	Economics	3+0	3,0
	Elective Courses (1)	-	5,0
			30,0

VI. SEMESTER

EEM 308 (Eng)	Introduction to Communication	3+2	6,5
EEM 336 (Eng)	Microprocessors I	3+2	7,0
EEM 342 (Eng)	Fundamentals of Control Systems	3+2	7,0
İŞL 101 (Eng)	Introduction to Business	3+0	4,5
	Elective Courses (1)	-	5,0
			30,0

VII. SEMESTER

EEM 413 (Eng)	Electrical and Electronics Engineering Design Project I	1+5	3,0
EEM 445 (Eng)	Design Process for Electrical and Electronics Engineers	2+0	3,0
	Departmental Elective Courses (4)	-	20,0
	Elective Courses (2)	-	4,0
			30,0

VIII. SEMESTER

EEM 414 (Eng)	Electrical and Electronics Engineering Design Project II	1+5	6,0
	Departmental Elective Courses (4)	-	20,0
	Elective Courses (1)	-	4,0
			30,0

DEPARTMENTAL ELECTIVE COURSES

BİM 222 (Eng)	Internet Programming	3+0	4,5
BİM 224 (Eng)	Object-Oriented Programming	3+0	5,5
BİM 312 (Eng)	Database Management Systems	3+0	6,0
EEM 322 (Eng)	Electronics II	3+0	5,0
EEM 334 (Eng)	Digital Systems II	3+0	5,0
EEM 403 (Eng)	Fundamentals of Optoelectronics and Nanophotonics	3+0	5,0
EEM 407 (Eng)	Digital VLSI Design	2+2	5,0
EEM 409 (Eng)	Random Signals	3+0	5,0
EEM 444 (Eng)	Object Oriented Design	3+0	5,0
EEM 446 (Eng)	Cryptographic Hardware Design	3+0	5,0

EEM 447	(Eng)	Research in Digital Systems I	1+4	5,0
EEM 448	(Eng)	Research in Digital Systems II	1+4	5,0
EEM 449	(Eng)	Embedded System Design	2+2	5,0
EEM 450	(Eng)	Introduction to System Identification	3+0	5,0
EEM 451	(Eng)	Industrial Control Systems	1+4	5,0
EEM 452	(Eng)	Introduction to Robotics	3+0	5,0
EEM 453	(Eng)	Research in Control and System Theory I	1+4	5,0
EEM 454	(Eng)	Research in Control and System Theory II	1+4	5,0
EEM 455	(Eng)	Research in Power Systems I	1+4	5,0
EEM 456	(Eng)	Research in Power Systems II	1+4	5,0
EEM 457	(Eng)	Research in Signal Processing I	1+4	5,0
EEM 458	(Eng)	Research in Signal Processing II	1+4	5,0
EEM 459	(Eng)	Research in Electronics I	1+4	5,0
EEM 460	(Eng)	Research in Electronics II	1+4	5,0
EEM 461	(Eng)	Research in Telecommunications I	1+4	5,0
EEM 462	(Eng)	Research in Telecommunications II	1+4	5,0
EEM 463	(Eng)	Introduction to Image Processing	3+0	5,0
EEM 465	(Eng)	Fundamentals of Data Communications	3+0	5,0
EEM 466	(Eng)	High Voltage Techniques	3+0	5,0
EEM 467	(Eng)	Digital Communications	3+0	5,0
EEM 468	(Eng)	Advanced Communication Techniques	3+0	5,0
EEM 469	(Eng)	Communication Electronics	3+0	5,0
EEM 470	(Eng)	Microwaves and Antennas	3+0	5,0
EEM 471	(Eng)	Electrical Machinery I	2+2	5,0
EEM 472	(Eng)	Electrical Machinery II	2+2	5,0
EEM 473	(Eng)	Power Systems Analysis I	3+0	5,0
EEM 475	(Eng)	Power Electronics I	3+0	5,0
EEM 476	(Eng)	Power Electronics II	2+2	5,0
EEM 477	(Eng)	Digital Signal Processing	3+0	5,0
EEM 478	(Eng)	Digital Signal Processing Hardware	1+4	5,0
EEM 479	(Eng)	Electrical Installation Systems	2+2	5,0
EEM 480	(Eng)	Algorithms and Complexity	3+0	5,0
EEM 481	(Eng)	Solid State Electronics	3+0	5,0
EEM 482	(Eng)	Fundamentals of Data Networks	3+0	5,0
EEM 483	(Eng)	Power Systems Analysis II	2+2	5,0
EEM 484	(Eng)	Integrated Circuit Design	3+0	5,0
EEM 485	(Eng)	Digital Electronic Circuits	3+0	5,0
EEM 486	(Eng)	Computer Architecture	3+0	5,0
EEM 489	(Eng)	Microprocessors II	2+2	5,0
EEM 490	(Eng)	Nonlinear Systems	3+0	5,0
EEM 491	(Eng)	Linear Control Systems	3+0	5,0
EEM 493	(Eng)	Digital Control Systems	3+0	5,0
EEM 494	(Eng)	Control Systems Laboratory	1+4	5,0
EEM 495	(Eng)	Network Synthesis	3+0	5,0
EEM 496	(Eng)	Communications Systems Laboratory	1+4	5,0
EEM 497	(Eng)	Communication Systems I	3+0	5,0
EEM 498	(Eng)	Communication Systems II	3+0	5,0
NÜM 301	(Eng)	Numerical Methods	3+0	3,5

ELECTIVE COURSES

ALM 255	(Ger)	German I	3+0	4,0
ALM 256	(Ger)	German II	3+0	4,0
ALM 357	(Ger)	German III	3+0	4,0
ALM 358	(Ger)	German IV	3+0	4,5
ARK 108		Archaeology	2+0	2,0
BEÖ 155		Physical Education	2+0	2,0
FEL 102	(Eng)	Introduction to Philosophy	2+0	2,5
FEL 401	(Eng)	Philosophy of Science	2+0	2,5
FOT 202		Photography	2+0	3,0
FRA 255	(Fra)	French I	3+0	4,0
FRA 256	(Fra)	French II	3+0	4,0
HUK 458		Industrial Rights and Technological Development	3+0	3,0
İLT 201	(Eng)	Interpersonal Communication	3+0	4,5
İSN 309	(Eng)	Mass Media	3+0	3,0
İSP 151	(Spa)	Spanish I	4+0	4,0
İSP 152	(Spa)	Spanish II	4+0	4,0
İŞL 201	(Eng)	Business Organization	3+0	4,0
İŞL 301	(Eng)	Human Resources Management	3+0	4,0
İŞL 321		Applied Entreprenneurship	3+1	5,0
İŞL 454	(Eng)	Management of Technology	3+0	4,5
İTA 255	(İta)	Italian I	3+0	4,0
İTA 256	(İta)	Italian II	3+0	4,0
KÜL 199		Cultural Activities	0+2	2,0
KÜL 451	(Eng)	History of Science and Engineering	3+0	4,5
MUH 151	(Eng)	Introduction to Accounting	3+0	4,5
MÜH 402	(Eng)	Engineering Ethics	2+0	3,0
MÜH 404	(Eng)	Innovation Management	3+0	3,0
MÜZ 101		Evolution of Music	2+0	3,0
MÜZ 151		Short History of Music	2+0	3,0
MÜZ 157		Traditional Turkish Art Music	2+0	2,0
PSİ 102	(Eng)	Psychology	3+0	3,5
PSİ 301	(Eng)	Industrial Psychology	3+0	4,5
PZL 302		Marketing Management	3+0	4,5
RUS 255	(Rus)	Russian I	3+0	4,0
RUS 256	(Rus)	Russian II	3+0	4,0
SAN 155		Hall Dances	0+2	2,0
SNT 155		History of Art	2+0	2,0
SOS 153	(Eng)	Sociology	3+0	3,5
SOS 154		Man and Sociology	2+0	3,0
SOS 155		Folkdance	2+0	2,0
TAR 201		History of Science	2+0	2,5
THU 203		Community Services	0+2	3,0
TİY 121		Introduction to Theatre	2+0	3,0
TİY 152		Theatre	2+0	2,5
TİY 308		Republic Era Turkish Theatre	2+0	3,0
TÜR 120		Turkish Sign Language	3+0	3,0

DEPARTMENT OF ENVIRONMENTAL ENGINEERING

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 Iki Eylül Campus, the Environmental Engineering Department has improved its education with new classrooms, laboratories, computer labs and other physical facilities. 9 Professor, 4 Associate Professors, 5 Assistant Professors, 1 Lecturer and 4 Assistants are currently working in the department. The department is governed by one chairman and two deputy chairmen.

Head : Prof. Dr. Yusuf YAVUZ
Deputy Head : Assoc. Prof. Dr. Serdar GÖNCÜ
Deputy Head : Zerrin GÜNKAYA

PROGRAM

I. SEMESTER

FİZ 105		Physics I	4+0	6,0
FİZ 107		Physics Laboratory I	0+2	1,5
MAT 805		Calculus I	4+2	7,5
TRS 127		Technical Drawing	2+2	4,5
TÜR 125		Turkish Language I	2+0	2,0
ÇEV 209	(Eng)	Technical English I	3+0	2,5
KİM 117	(Eng)	General Chemistry I	4+0	6,0
				30,0

II. SEMESTER

FİZ 106		Physics II	4+0	6,0
FİZ 108		Physics Laboratory II	0+2	1,5
MAT 806		Calculus II	4+2	7,5
TÜR 126		Turkish Language II	2+0	2,0
ÇEV 203	(Eng)	Introduction to Environmental Engineering	2+0	3,5
KİM 115	(Eng)	General Chemistry Laboratory	0+2	1,5
KİM 118	(Eng)	General Chemistry II	4+0	6,0
		Elective Courses (1)	-	2,0
				30,0

III. SEMESTER

ÇEV 211		Environmental Chemistry Laboratory I	0+3	3,0
ÇEV 213		Environmental Chemistry I	3+0	4,5
MAT 219		Differential Equations	2+2	4,5
TAR 165		Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
ÇEV 210	(Eng)	Technical English II	2+0	2,0
İKT 151	(Eng)	Economics	3+0	3,0
MLZ 203	(Eng)	Materials Science	3+0	3,5
		Departmental Elective Courses (1)	-	4,5
		Elective Courses (1)	-	3,0
				30,0

IV. SEMESTER

BİY 353		Environmental Microbiology	3+0	4,5
BİY 357		Environmental Microbiology Laboratory	0+3	2,5
ÇEV 212		Environmental Chemistry Laboratory II	0+3	3,0
TAR 166		Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
ÇEV 206	(Eng)	Environmental Chemistry II	3+0	4,5
MEK 215	(Eng)	Statics and Strength of Materials	3+0	4,5
NÜM 202	(Eng)	Linear Algebra and Numerical Methods	4+0	4,5
		Departmental Elective Courses (1)	-	4,5
				30,0

V. SEMESTER

MEK 315		Fluid Mechanics	3+2	6,0
ÇEV 305	(Eng)	Unit Operations and Processes I	4+0	6,0
ÇEV 313	(Eng)	Unit Operations and Processes Laboratory I	0+3	3,0

VI. SEMESTER

ÇEV 324		Unit Operations and Processes II	4+0	6,0
İST 201		Statistics	3+0	3,0
TER 403		Thermodynamics	3+0	4,5

İNŞ 308	(Eng)	Hydrology	3+0	4,5
		Departmental Elective Courses (2)	-	7,5
		Elective Courses (1)	-	3,0
				30,0

ÇEV 314	(Eng)	Unit Operations and Processes Laboratory II	0+3	3,5
ÇEV 316	(Eng)	Air Pollution	3+0	4,5
		Departmental Elective Courses (2)	-	8,5
				30,0

VII. SEMESTER

ÇEV 421		Solid Waste Management	3+2	6,0
ÇEV 449		Graduation Project in Environmental Engineering I	1+2	3,0
İSG 401		Occupational Health and Safety I	2+0	2,0
ÇEV 445	(Eng)	Environmental Modeling	3+0	4,5
ÇEV 447	(Eng)	Wastewater Engineering	3+0	4,0
		Departmental Elective Courses (3)	-	10,5
				30,0

VIII. SEMESTER

ÇEV 450		Graduation Project in Environmental Engineering II	2+4	6,0
İSG 402		Occupational Health and Safety II	2+0	2,0
		Departmental Elective Courses (4)	-	19,0
		Elective Courses (3)	-	3,0
				30,0

DEPARTMENTAL ELECTIVE COURSES

BİL 301	(Eng)	Computer Programming in Engineering	2+1	3,5
BİL 486		Computer Applications in Environmental Engineering	2+1	3,0
ÇEV 219		Ecology	3+0	4,5
ÇEV 309		Social Environmental Science	2+0	3,0
ÇEV 310		Water and Soil Pollution	3+0	4,0
ÇEV 311		Environmental Economy	2+0	3,0
ÇEV 312		Water Supply and Sewerage	3+0	4,5
ÇEV 320		Environmental Problems Resulting from Energy Production	3+0	4,0
ÇEV 322		Environment Health	2+0	3,0
ÇEV 326		Information Technologies in Environmental Engineering	3+0	4,0
ÇEV 328	(Eng)	Instrumental Analysis in Environmental Studies	3+0	4,5
ÇEV 332		Introduction to Ecological Economy	3+0	4,5
ÇEV 408		Water Quality Assessment	3+0	4,0
ÇEV 409		Experimental Design	3+0	4,0
ÇEV 413	(Eng)	Flow Through Porous Media and Modeling	3+0	4,0
ÇEV 423		Applications of Remote Sensing and GIS in Environmental Sciences	3+0	4,5
ÇEV 427	(Eng)	Air Pollution Control	3+0	4,5
ÇEV 431		Water Treatment Project	1+2	4,0
ÇEV 432		Wastewater Treatment Project	1+2	4,0
ÇEV 438		Environmental Management	3+2	6,0
ÇEV 442		Hazardous Waste Management	3+0	3,0
ÇEV 443		Water Reuse	2+0	3,0
ÇEV 444		Solid Waste Management Project	1+2	4,0
ÇEV 448	(Eng)	Coastal Zone Management	2+0	3,0
ÇEV 453		Environmental Ethics and Environmental Engineering	3+0	4,5
ÇEV 455		Occupational Health and Safety	3+0	4,5
ÇEV 457		Computer Aided Mapping at Engineering Science	3+0	4,5
ÇEV 459	(Eng)	Principles of Biological Treatment	3+0	4,0
ÇEV 461		Green Engineering Design and Sustainability	3+0	4,5
ÇEV 462	(Eng)	Computer Aided Engineering Design	3+0	4,5
ÇEV 463		Quality Management Systems in Environmental Engineering	3+0	4,5
ÇEV 464	(Eng)	Industrial Hygiene and Work Safety	2+0	3,0
ÇEV 465		Sludge Treatment and Disposal	3+0	4,5
ÇEV 466		Ecological Planning and Ecotechnology	2+0	3,0
ÇEV 467	(Eng)	Environmental Exposure Assessment	3+0	4,5
ÇEV 468		Watershed Management	2+0	3,0
ÇEV 469		Water and Waswater Treatment Using Membrane Systems and Processing	3+0	4,5
ÇEV 472		Environmental Politics	3+0	4,5
ÇEV 474	(Eng)	Environmental Reactions and Reactor Kinetics	3+0	4,5
ÇEV 475		Environmental Legislation I	2+0	3,0
ÇEV 476		Environmental Legislation II	2+0	3,0
ÇEV 478		Atmospheric Chemistry	3+0	4,5
ÇEV 480		Air Pollution Meteorology and Atmospheric Dispersion	3+0	4,0
ÇEV 482		Air Pollution Laboratory	1+2	3,0
ÇEV 484		Small-scale Wastewater Treatment Systems	2+0	3,0
ÇEV 486		Industrial Wastewater Treatment	3+0	4,0

ÇEV 488	Landfill Design	3+0	4,0
ÇEV 489	Advanced Treatment of Water and Wastewater I	3+0	4,0
ÇEV 490	Advanced Treatment of Water and Wastewater II	3+0	4,0
ÇEV 492	Air Quality Management Project	1+2	4,0
MÜH 302	Interdisciplinary Applications	1+2	4,5
MÜH 302 (Eng)	Interdisciplinary Applications	1+2	4,5

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ALM 357 (Ger)	German III	3+0	4,0
ALM 358 (Ger)	German IV	3+0	4,5
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
FEL 102	Introduction to Philosophy	2+0	2,5
FEL 401	Philosophy of Science	2+0	2,5
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
HUK 252	Labor Law	2+0	2,5
HUK 458	Industrial Rights and Technological Development	3+0	3,0
İLT 201	Interpersonal Communication	3+0	4,5
İLT 370	New Approaches in Management	3+0	6,5
İSN 309	Mass Media	3+0	3,0
İŞL 101	Introduction to Business	3+0	4,5
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
KÜL 451 (Eng)	History of Science and Engineering	3+0	4,5
MÜH 402	Engineering Ethics	2+0	3,0
MÜH 404	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
PZL 302	Marketing Management	3+0	4,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 153	Sociology	3+0	3,5
SOS 154	Man and Sociology	2+0	3,0
TAR 201	History of Science	2+0	2,5
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF INDUSTRIAL ENGINEERING (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 Enterprices Resource Planning, ISO 9001 Quality Management System, fizibilite analysis are related to Industrial Engineering. Anadolu University, Industrial Engineering Department was established in 2002. One professor, three assistant professors, three teaching assistants, six research assistants and two visiting teaching assistants are working in the department. The decisions related with the department are made by the department council which is composed of all faculty members of the department. The research projects are supported with Anadolu University Scientific Research Project Commission. The capacity of the department is 40 students per year for undergraduate program. Students must attend English preparatory class before beginning their four-year Industrial Engineering education. Advanced computer facilities are offered to the students. They can manage production planning, inventory control, work force planning, management etc. with computer based system design. Industrial Engineering Department supports the computer-based education in theory and application.Günümüzde teknolojik gelişme ülke kalkınmasında önemli bir rol oynamaktadır. Bu teknolojik gelişmede makine, insan ve para yönetiminin yanı sıra, bu üç faktörün birlikte en verimli ve ergonomik koşullarda kullanılması da büyük önem taşımaktadır. Endüstri Mühendisliği, makine, insan ve para kaynaklarını etkin ve verimli bir şekilde planlayarak optimum çıktıyı elde etmeyi amaçlar. Endüstri Mühendisliği insan, makine ve ekipmanın bütünleşik sistemlerinin tasarımı, gelişmesi ve kurulmasıyla ilgilenir; bu sistemlerden elde edilen sonuçları belirtmek, değerlendirmek, için mühendislik analiz ve tasarım yöntemleriyle birlikte matematik, fizik ve sosyal bilimlerde uzmanlık gösterir. Bütünleşik kaynak planlaması İSO 9001 Kalite Yönetim Sistemleri fizibilite analizleri, gibi konular Endüstri Mühendislerinin ilgilendiği alanlardır. Anadolu Üniversitesi Endüstri Mühendisliği Bölümü 2002 yılında kurulmuştur. 2 Profösör, 2 Doçent, 7 Yardımcı Doçent, 11 Araştırma Görevlisi bulunmaktadır. 2013-2014 Öğretim Yılı'nda 62 öğrenci alınmıştır. Öğrenciler dört yıllık Endüstri Mühendisliği eğitimine başlamadan önce İngilizce hazırlık sınıfı okumak veya İngilizce yeterlilik sınavından geçmek zorundadırlar. Öğrencilere gelişmiş bilgisayar laboratuar olanakları sunulmaktadır. Bilgisayar laboratuarları genel amaçlı olmanın yanı sıra Endüstri Mühendisliğine özel yazılımları içeren laboratuarlar da mevcuttur. Endüstri Mühendisliği'ne özel laboratuarları da, üretim planlaması, hat dengeleme ve iş gücü planlaması konularını içeren Üretim Modülü, malzeme tedariğini ve stok kontrolünü içeren Malzeme Yönetim Modülü, Satış Dağıtım Modülü, İnsan Kaynakları Modülü, Mali İşler ve Mali Muhasebe

Modülü olan SAP R/3 programı, ARENA, MINITAB, SPSS, LINDO, LINGO vb. pek çok yazılımları öğrencilerin kullanabilmesi mümkündür.

Head : Prof. Dr. Nihal ERGİNEL

Deputy Head : Ilgın ACAR

PROGRAM

I. SEMESTER

ENM 102 (Eng)	Introduction to Industrial Engineering	2+0	3,0
FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
KİM 113 (Eng)	General Chemistry	4+0	6,0
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
MAT 805 (Eng)	Calculus I	4+2	7,5
TRS 127 (Eng)	Technical Drawing	2+2	4,5
			30,0

II. SEMESTER

ENM 104 (Eng)	Introduction to Computation and Programming for Industrial Engineering	2+2	4,5
FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
İKT 151 (Eng)	Economics	3+0	3,0
İŞL 116 (Eng)	Fundamentals of Business	3+0	3,0
MAT 251 (Eng)	Linear Algebra	3+0	4,5
MAT 806 (Eng)	Calculus II	4+2	7,5
			30,0

III. SEMESTER

BİL 255 (Eng)	Advanced Computer Programming	3+0	4,5
ENM 203 (Eng)	Linear Programming	2+2	5,5
İSG 401	Occupational Health and Safety I	2+0	2,0
MAT 219 (Eng)	Differential Equations	2+2	4,5
MEK 215 (Eng)	Statics and Strength of Materials	3+0	4,5
MUH 210 (Eng)	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
	Elective Courses (1)	-	2,0
			30,0

IV. SEMESTER

ENM 212 (Eng)	Integer Programming and Network Models	2+2	6,0
ENM 214 (Eng)	Manufacturing Methods and Material Selection	3+2	5,0
ENM 407 (Eng)	Systems Analysis	3+0	5,0
İSG 402	Occup. Health and Safety II	2+0	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 (1)	-	3,0
			30,0

V. SEMESTER

BİL 409 (Eng)	Decision Support Systems	3+0	6,0
ENM 301 (Eng)	Work Study	3+0	4,0
ENM 308 (Eng)	Production Plan. and Control I	4+0	5,0
ENM 317 (Eng)	Engineering Statistics	3+0	4,5
İKT 356 (Eng)	Engineering Economics	3+0	4,5
	Depart. Elective Courses (1)	-	6,0
			30,0

VI. SEMESTER

ENM 307 (Eng)	Simulation	2+2	6,0
ENM 310 (Eng)	Experimental Design and Regression Analysis	3+0	4,5
ENM 401 (Eng)	Production Plan. and Control II	4+0	5,0
ENM 426 (Eng)	Ergonomics	3+0	4,5
	Depart. Elective Courses (2)	-	10,0
			30,0

VII. SEMESTER

ENM 427 (Eng)	Special Topics In Industrial Engineering	1+2	5,0
ENM 435 (Eng)	Engineering Seminars I	0+2	1,0
HUK 252 (Eng)	Labor Law	2+0	2,5
TKY 302 (Eng)	Quality Control	3+0	4,5
	Depart. Elective Courses (3)	-	14,0
	Elective Courses (1)	-	3,0
			30,0

VIII. SEMESTER

ENM 428 (Eng)	Industrial Engineering Applications	2+4	8,0
	Departmental Elective Courses (4)	-	22,0
			30,0

DEPARTMENTAL ELECTIVE COURSES

BİM 211 (Eng)	Visual Programming	2+2	6,0
BİM 213 (Eng)	Data Structures and Algorithms	2+2	5,5
BİM 222 (Eng)	Internet Programming	3+0	4,5
BİM 312 (Eng)	Database Management Systems	3+0	6,0
ENM 304 (Eng)	Investment Planning and Analysis	4+0	6,0
ENM 306 (Eng)	Stochastic Models	3+0	4,5
ENM 315 (Eng)	Nonlinear Programming	2+2	6,0
ENM 411 (Eng)	Facilities Planning	3+0	4,5
ENM 415 (Eng)	Design, Creativity and Innovation	3+0	4,5
ENM 420 (Eng)	Service Systems	3+0	4,5
ENM 437 (Eng)	Structural Equation Modeling	3+0	4,5
ENM 440 (Eng)	Introduction to Data Mining	3+0	4,5
ENM 442 (Eng)	Decision Analysis	3+0	4,5
ENM 448 (Eng)	Project Planning and Management	3+0	6,0
FİN 415 (Eng)	Financial Markets and Institutions	3+0	4,5
İST 411 (Eng)	Time Series Analysis	4+0	5,0
İŞL 323 (Eng)	Human Resources Management	3+0	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
LOJ 401 (Eng)	Logistics Management and Models	3+0	6,0
MÜH 302 (Eng)	Interdisciplinary Applications	1+2	4,5
PZL 310 (Eng)	Marketing Management	3+0	5,0
PZL 452 (Eng)	Revenue Management and Pricing	3+0	6,0

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
İLT 201	Interpersonal Communication	3+0	4,5
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 321	Applied Entreprenneurship	3+1	5,0
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
MÜH 402	Engineering Ethics	2+0	3,0
MÜH 404	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SAN 155	Hall Dances	0+2	2,0
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF INDUSTRIAL ENGINEERING

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 Enterprices Resource Planning, ISO 9001 Quality Management System, fizibilite analysis are related to Industrial Engineering. Anadolu University, Industrial Engineering Department was established in 2002. One professor, three assistant professors, three teaching assistants, six research assistants and two visiting teaching assistants are working in the department. The decisions related with the department are made by the department council which is composed of all faculty members of the department. The research projects are supported with Anadolu University Scientific Research Project Commission. The capacity of the department is 40 students per year for undergraduate program. Students must attend English preparatory class before beginning their four-year Industrial Engineering education. Advanced computer facilities are offered to the students. They can manage production planning, inventory control, work force planning, management etc. with computer based system design. Industrial Engineering Department supports the computer-based education in theory and application.

Head : Prof. Dr. Nihal ERGİNEL
Deputy Head : Ilgın ACAR

PROGRAM

I. SEMESTER

FİZ 105	Physics I	4+0	6,0
FİZ 107	Physics Laboratory I	0+2	1,5
MAT 805	Calculus I	4+2	7,5
TRS 127	Technical Drawing	2+2	4,5
ENM 102 (Eng)	Introduction to Industrial Engineering	2+0	3,0
KİM 113 (Eng)	General Chemistry	4+0	6,0
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
			30,0

II. SEMESTER

FİZ 106	Physics II	4+0	6,0
FİZ 108	Physics Laboratory II	0+2	1,5
İKT 151	Economics	3+0	3,0
MAT 806	Calculus II	4+2	7,5
ENM 104 (Eng)	Introduction to Computation and Programming for Industrial Engineering	2+2	4,5
İŞL 116 (Eng)	Fundamentals of Business	3+0	3,0
MAT 251 (Eng)	Linear Algebra	3+0	4,5
			30,0

III. SEMESTER

İSG 401	Occupational Health and Safety I	2+0	2,0
MAT 219	Differential Equations	2+2	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
BİL 255 (Eng)	Advanced Computer Programming	3+0	4,5
ENM 203 (Eng)	Linear Programming	2+2	5,5
MEK 215 (Eng)	Statics and Strength of Materials	3+0	4,5
	Elective Courses (1)	-	2,0
			30,0

IV. SEMESTER

ENM 214	Manufacturing Methods and Material Selection	3+2	5,0
İSG 402	Occupational Health and Safety II	2+0	2,0
İST 244	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
ENM 212 (Eng)	Integer Programming and Network Models	2+2	6,0
ENM 407 (Eng)	Systems Analysis	3+0	5,0
	Elective Courses (1)	-	3,0
			30,0

V. SEMESTER

ENM 301	Work Study	3+0	4,0
ENM 317	Engineering Statistics	3+0	4,5
BİL 409 (Eng)	Decision Support Systems	3+0	6,0
ENM 308 (Eng)	Production Planning and Control I	4+0	5,0
İKT 356 (Eng)	Engineering Economics	3+0	4,5
	Departmental Elective Courses (1)	-	6,0
			30,0

VI. SEMESTER

ENM 310	Experiment Design and Regression Analysis	3+0	4,5
ENM 307 (Eng)	Simulation	2+2	6,0
ENM 401 (Eng)	Production Planning and Control II	4+0	5,0
ENM 426 (Eng)	Ergonomics	3+0	4,5
	Departmental Elective Courses (2)	-	10,0
			30,0

VII. SEMESTER

ENM 427	Special Topics in Industrial Engineering	1+2	5,0
ENM 435	Engineering Seminars I	0+2	1,0
HUK 252	Labor Law	2+0	2,5
TKY 302	Quality Control	3+0	4,5
	Departmental Elective Courses (3)	-	14,0
	Elective Courses (1)	-	3,0
			30,0

VIII. SEMESTER

ENM 428	Industrial Engineering Applications	2+4	8,0
	Departmental Elective Courses (4)	-	22,0
			30,0

DEPARTMENTAL ELECTIVE COURSES

ANA 121	Human Anatomy and Kinesiology	4+0	5,0
ARY 202	Research Techniques	3+0	5,0
BİM 211 (Eng)	Visual Programming	2+2	6,0
BİM 213 (Eng)	Data Structures and Algorithms	2+2	5,5
BİM 222 (Eng)	Internet Programming	3+0	4,5
BİM 312 (Eng)	Database Management Systems	3+0	6,0
ENM 304 (Eng)	Investment Planning and Analysis	4+0	6,0
ENM 306 (Eng)	Stochastic Models	3+0	4,5
ENM 309	Industrial Information Systems	3+0	6,0
ENM 312	Manufacturing Systems Analysis	3+0	5,0
ENM 313	Mathematical Programming Models in Engineering	3+0	4,5
ENM 315 (Eng)	Nonlinear Programming	2+2	6,0
ENM 411	Facility Planning	3+0	4,5
ENM 413	Planning and Scheduling in Manufacturing and Service Systems	3+0	4,0
ENM 415 (Eng)	Design, Creativity and Innovation	3+0	4,5
ENM 420	Service Systems	3+0	4,5
ENM 430	Cognitive Ergonomics	3+0	4,5
ENM 431	Advanced Production Systems	3+0	4,5
ENM 432	Lean Thinking and Lean Manufacturing Management	3+0	4,5
ENM 437 (Eng)	Structural Equation Modeling	3+0	4,5
ENM 438	Industrial Scheduling	3+0	4,5
ENM 440 (Eng)	Introduction to Data Mining	3+0	4,5
ENM 442 (Eng)	Decision Analysis	3+0	4,5
ENM 444	Supply Chain Modeling And Analysis	3+0	4,5
ENM 446	Enterprise Resource Planning	3+0	4,5
ENM 448 (Eng)	Project Planning and Management	3+0	6,0
FİN 306	Capital Markets	2+0	3,0
FİN 415 (Eng)	Financial Markets and Institutions	3+0	4,5
İST 401	Multivariate Statistics I	3+0	4,5
İST 402	Multivariate Statistics II	3+0	4,0
İST 411 (Eng)	Time Series Analysis	4+0	5,0
İŞL 301	Human Resources Management	3+0	4,0
İŞL 323 (Eng)	Human Resources Management	3+0	5,0
İŞL 412	Strategic Management	2+0	3,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
LOJ 401	Logistics Management and Models	3+0	6,0
MÜH 302	Interdisciplinary Applications	1+2	4,5
MÜH 302 (Eng)	Interdisciplinary Applications	1+2	4,5
PZL 310 (Eng)	Marketing Management	3+0	5,0
PZL 452 (Eng)	Revenue Management and Pricing	3+0	6,0
TKY 405	Total Quality Management	3+0	4,5

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ALM 357 (Ger)	German III	3+0	4,0
ALM 358 (Ger)	German IV	3+0	4,5
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
İLT 201	Interpersonal Communication	3+0	4,5
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 321	Applied Entreprenneurship	3+1	5,0
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
MÜH 402	Engineering Ethics	2+0	3,0
MÜH 404	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 155	Turkish Folk Music	2+0	2,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SAN 155	Hall Dances	0+2	2,0
SNT 155	History of Art	2+0	2,0
SOS 155	Folkdance	2+0	2,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TÜR 120	Turkish Sign Language	3+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 Iki Eylul Campus and occupies a covered area of 5000 m2. 7 Professors, 4 Associate Professors, 5 Assistant Professors and 10 Assistants and 3 Technical personal are currently working in the department. The are 24 PhD students who are registrated at Industrial PhD Scholarship Program which aims to educate students who are familiar to industry and willing to carry on their carrier in industry. 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.

Head : Prof. Dr. Gürsoy ARSLAN
Deputy Head : Yasemin ÇELİK
Deputy Head : İsmail Özgür ÖZER

PROGRAM

I. SEMESTER

TÜR 125	Turkish Language I	2+0	2,0
FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
KİM 117 (Eng)	General Chemistry I	4+0	6,0
MAT 805 (Eng)	Calculus I	4+2	7,5
MLZ 103 (Eng)	Materials in Practice	2+0	2,5
TRS 127 (Eng)	Technical Drawing	2+2	4,5
			30,0

II. SEMESTER

TÜR 126	Turkish Language II	2+0	2,0
FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
KİM 115 (Eng)	General Chemistry Laboratory	0+2	1,5
KİM 118 (Eng)	General Chemistry II	4+0	6,0
MAT 806 (Eng)	Calculus II	4+2	7,5
MLZ 110 (Eng)	Structure of Materials	2+1	3,5
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
BİL 158 (Eng)	Fundamentals of Information Technology	2+2	4,5
İST 201 (Eng)	Statistics	3+0	3,0
MAT 219 (Eng)	Differential Equations	2+2	4,5
MEK 215 (Eng)	Statics and Strength of Materials	3+0	4,5
MLZ 213 (Eng)	Physical Properties of Materials	3+0	5,0
MLZ 229 (Eng)	Materials Characterization Techniques I	2+0	2,0
NÜM 202 (Eng)	Linear Algebra and Numerical Methods	4+0	4,5
			30,0

IV. SEMESTER

TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
İKT 151 (Eng)	Economics	3+0	3,0
İNG 250 (Eng)	Reading and Speaking in English	2+0	2,0
MLZ 210 (Eng)	Raw Materials and Unit Operations	3+0	4,5
MLZ 222 (Eng)	Materials Characterization Techniques Laboratory	0+2	3,0
MLZ 224 (Eng)	Materials Thermodynamics I	3+1	4,5
MLZ 230 (Eng)	Materials Characterization Techniques II	2+0	3,5
MLZ 308 (Eng)	Mechanical Behavior of Materials	3+0	4,0
MLZ 311 (Eng)	Non-crystalline Materials	3+0	3,5
			30,0

V. SEMESTER

KİM 327 (Eng)	Organic Chemistry	3+0	4,0
MLZ 305 (Eng)	Materials Processing Laboratory I	0+4	4,5
MLZ 307 (Eng)	Phase Diagrams	3+0	4,5
MLZ 309 (Eng)	Ceramics Processing	3+0	4,5
MLZ 321 (Eng)	Materials and Energy Balance	2+2	4,0
MLZ 325 (Eng)	Materials Thermodynamics II	3+1	4,5

VI. SEMESTER

İNG 360 (Eng)	English for Business	2+0	2,0
MLZ 306 (Eng)	Materials Processing Laboratory II	0+4	3,0
MLZ 314 (Eng)	Transport Phenomena in Materials Processing	4+0	6,0
MLZ 318 (Eng)	Metallic Materials	4+0	4,5
MLZ 403 (Eng)	Processing of Polymers	3+0	4,5

	Departmental Elective Courses (1)	-	4,0
			30,0

	Departmental Elective Courses (1)	-	4,0
	Elective Courses (2)	-	6,0
			30,0

VII. SEMESTER

MLZ 407	(Eng)	Seminar	0+2	2,5
MLZ 425	(Eng)	Advanced Materials and Composites	3+0	4,5
MLZ 435	(Eng)	Degradation of Engineering Materials	3+0	4,0
MLZ 437	(Eng)	Plasticity and Deformation Processes	3+0	3,5
MLZ 497	(Eng)	Design for Materials Science and Engineering	1+2	3,0
TKY 302	(Eng)	Quality Control	3+0	4,5
		Departmental Elective Courses (2)	-	8,0
				30,0

VIII. SEMESTER

MLZ 430	(Eng)	Materials Selection and Design	3+2	7,0
MLZ 490	(Eng)	Application in Materials Engineering	2+2	5,0
MLZ 498	(Eng)	Design Applications in Materials Science and Engineering	2+4	7,0
		Departmental Elective Courses (2)	-	8,0
		Elective Courses (1)	-	3,0
				30,0

DEPARTMENTAL ELECTIVE COURSES

BİM 316	(Eng)	Introduction to Computer Aided Design	2+2	4,0
BİM 405	(Eng)	Project Management	3+0	4,5
ENM 310	(Eng)	Experimental Design and Regression Analysis	3+0	4,5
MLZ 310	(Eng)	Thermochemistry of Materials	3+0	4,0
MLZ 312	(Eng)	Whitewares	3+0	4,0
MLZ 320	(Eng)	Glass Technology	3+0	4,0
MLZ 322	(Eng)	Fundamentals of Semiconductors	3+0	4,0
MLZ 323	(Eng)	Solid State Physics in Materials Science	3+0	4,0
MLZ 324	(Eng)	Instrumental Analysis	3+0	4,0
MLZ 405	(Eng)	Electrical, Magnetic and Optical Properties of Materials	3+0	4,0
MLZ 408	(Eng)	Joining of Materials	3+0	4,0
MLZ 409	(Eng)	Tile and Brick	3+0	4,0
MLZ 410	(Eng)	Biomaterials	3+0	4,0
MLZ 412	(Eng)	Technical Glasses	3+0	4,0
MLZ 413	(Eng)	Powder Metallurgy	3+0	4,0
MLZ 414		Special Topics in Quality Control	3+0	4,0
MLZ 415	(Eng)	Materials Industry and Environment	3+0	4,0
MLZ 416	(Eng)	Cement and Concrete	3+0	4,0
MLZ 417	(Eng)	Refractories	3+0	4,0
MLZ 419	(Eng)	Chemical Metallurgy	3+0	4,0
MLZ 420	(Eng)	Chemistry of Polymers	3+0	4,0
MLZ 421	(Eng)	Chemical Processing of Advanced Technology Ceramics	3+0	4,0
MLZ 422	(Eng)	Glazes and Enamels	3+0	4,0
MLZ 423	(Eng)	Glass Ceramics	3+0	4,0
MLZ 424	(Eng)	Casting	3+0	4,0
MLZ 426	(Eng)	Ferrous Extractive Metallurgy	3+0	4,0
MLZ 429	(Eng)	Archaeometry and Application	3+0	4,0
MLZ 431	(Eng)	Alloys	3+0	4,0
MLZ 432	(Eng)	Rubber and Rubber Technology	3+0	4,0
MLZ 433	(Eng)	Thin Film Technology	3+0	4,0
MLZ 434	(Eng)	Aviation Materials	3+0	4,0
MLZ 436	(Eng)	Casting Technology	3+0	4,0
MLZ 438	(Eng)	Friction and Wear of Engineering Materials	3+0	4,0
MLZ 439	(Eng)	Polymer Matrix Composites	3+0	4,0
MLZ 440	(Eng)	Building Materials	3+0	4,0
MLZ 441	(Eng)	Nano Materials and Nano Technology	3+0	4,0
MLZ 442	(Eng)	Industrial Processing of Metals	3+0	4,0
MLZ 443	(Eng)	Particle Size Control Mechanism	3+0	4,0
MLZ 444	(Eng)	Welding Technologies	3+0	4,0
MLZ 445	(Eng)	Phase Transformations in Metals and Alloys	3+0	4,0
MLZ 446	(Eng)	Textile Materials	3+0	4,0
MLZ 448	(Eng)	Dental Materials	3+0	4,0
MLZ 450	(Eng)	Computational Materials Science	3+0	4,0
MLZ 451	(Eng)	Machining Technology of Metals	3+0	4,0
MLZ 452	(Eng)	Engineering Materials for Armour Applications	3+0	4,0
MLZ 454	(Eng)	Smart Materials	3+0	4,0
MLZ 456	(Eng)	Phsysical Properties of Nanomaterials	3+0	4,0
MLZ 458	(Eng)	Mathematical Relations in Powder Processing	3+0	4,0
MÜH 302		Interdisciplinary Applications	1+2	4,5
MÜH 302	(Eng)	Interdisciplinary Applications	1+2	4,5

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ALM 357 (Ger)	German III	3+0	4,0
ALM 358 (Ger)	German IV	3+0	4,5
ARK 108	Archaeology	2+0	2,0
BEÖ 155	Physical Education	2+0	2,0
ÇEV 462	Computer Aided Engineering Design	3+0	4,5
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
HUK 252	Labor Law	2+0	2,5
HUK 458	Industrial Rights and Technological Development	3+0	3,0
İKT 209 (Eng)	Money and Banking	3+0	5,0
İKT 356 (Eng)	Engineering Economics	3+0	4,5
İLT 201	Interpersonal Communication	3+0	4,5
İSN 309	Mass Media	3+0	3,0
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 101 (Eng)	Introduction to Business	3+0	4,5
İŞL 103 (Eng)	Business Management	3+0	3,5
İŞL 201 (Eng)	Business Organization	3+0	4,0
İŞL 302 (Eng)	Production Management and Systems	3+0	4,5
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
MÜH 402 (Eng)	Engineering Ethics	2+0	3,0
MÜH 404 (Eng)	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
PZL 211 (Eng)	Principles of Marketing	3+0	5,0
PZL 302	Marketing Management	3+0	4,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 154	Man and Sociology	2+0	3,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TOP 102	Surveying	2+2	4,5
TÜR 120	Turkish Sign Language	3+0	3,0

DEPARTMENT OF MECHANICAL ENGINEERING

Head : Assoc. Prof. Dr. Cem SEVİK
Deputy Head : Kadri Can ATLI

PROGRAM

I. SEMESTER

FİZ 105 (Eng)	Physics I	4+0	6,0
FİZ 107 (Eng)	Physics Laboratory I	0+2	1,5
KİM 113 (Eng)	General Chemistry	4+0	6,0
MAT 805	Calculus I	4+2	7,5
MKM 101	Technical Drawing for Mechanical Engineers	2+2	5,0
MKM 103 (Eng)	Technical English for Mechanical Engineers	2+0	2,0
TÜR 125	Turkish Language I	2+0	2,0
			30,0

II. SEMESTER

FİZ 106 (Eng)	Physics II	4+0	6,0
FİZ 108 (Eng)	Physics Laboratory II	0+2	1,5
MAT 806	Calculus II	4+2	7,5
MKM 102 (Eng)	Introduction to Mechanical Engineering	3+0	6,0
MKM 104	Computer Aided Engineering Technical Drawing	2+2	5,0
TÜR 126	Turkish Language II	2+0	2,0
	Elective Courses (1)	-	2,0
			30,0

III. SEMESTER

BİL 200 (Eng)	Computer Programming	2+2	6,0
İKT 356 (Eng)	Engineering Economics	3+0	4,5
İST 201 (Eng)	Statistics	3+0	3,0
MAT 219	Differential Equations	2+2	4,5

IV. SEMESTER

EEM 214 (Eng)	Electrical Engineering for Mechanical Engineers	3+0	3,5
MAT 251 (Eng)	Linear Algebra	3+0	4,5

MEK 217 (Eng)	Engineering Mechanics: Statics	3+0	5,0
TAR 165	Atatürk's Principles and History of Turkish Revolution I	2+0	2,0
TER 207 (Eng)	Thermodynamics I	3+0	5,0
			30,0

MEK 216 (Eng)	Engineering Mechanics: Dynamics	3+0	4,0
MLZ 203 (Eng)	Materials Science	3+0	3,5
TAR 166	Atatürk's Principles and History of Turkish Revolution II	2+0	2,0
TER 208 (Eng)	Thermodynamics II	3+0	5,0
	Departmental Elective Courses (1)	-	4,5
	Elective Courses (1)	-	3,0
			30,0

V. SEMESTER

MEK 311 (Eng)	Strength of Materials	4+0	6,0
MKM 301 (Eng)	Theory of Machines	3+0	7,0
MKM 303 (Eng)	Heat Transfer	4+0	6,5
NÜM 301 (Eng)	Numerical Methods	3+0	3,5
	Departmental Elective Courses (1)	-	4,0
	Elective Courses (1)	-	3,0
			30,0

VI. SEMESTER

EEM 342 (Eng)	Fundamentals of Control Systems	3+2	7,0
MEK 317 (Eng)	Fluid Mechanics	4+0	5,0
MKM 302 (Eng)	Machine Design I	4+0	6,0
MKM 304 (Eng)	Manufacturing Techniques	2+2	5,0
MKM 306 (Eng)	Experimental Engineering	2+2	4,0
	Elective Courses (1)	-	3,0
			30,0

VII. SEMESTER

İSG 401	Occupational Health and Safety I	2+0	2,0
MKM 401 (Eng)	Machine Design II	4+0	6,0
MKM 403	Mechanical Engineering Design I	2+2	5,0
	Departmental Elective Courses (3)	-	13,0
	Elective Courses (1)	-	4,0
			30,0

VIII. SEMESTER

İSG 402	Occupational Health and Safety II	2+0	2,0
MKM 404	Mechanical Engineering Design II	2+4	5,0
	Departmental Elective Courses (4)	-	19,0
	Elective Courses (1)	-	4,0
			30,0

DEPARTMENTAL ELECTIVE COURSES

ÇEV 455	Occupational Health and Safety	3+0	4,5
EEM 311 (Eng)	Principles of Energy Conversion	3+2	7,0
EEM 471 (Eng)	Electrical Machinery I	2+2	5,0
EEM 472 (Eng)	Electrical Machinery II	2+2	5,0
EEM 490 (Eng)	Nonlinear Systems	3+0	5,0
EEM 491 (Eng)	Linear Control Systems	3+0	5,0
EEM 493 (Eng)	Digital Control Systems	3+0	5,0
EEM 494 (Eng)	Control Systems Laboratory	1+4	5,0
İNŞ 467 (Eng)	Construction Equipments	3+0	4,5
İNŞ 469 (Eng)	Renewable Energy with Water, Wind and Wave Power	3+0	4,5
MEK 404 (Eng)	Applied Fluid Mechanics	2+2	5,0
MEK 405 (Eng)	Applied Strength of Materials	3+0	5,0
MEK 406 (Eng)	Mechanical Vibrations	3+0	5,0
MEK 439 (Eng)	Thermal System Design	2+2	5,0
MKM 220	Problem Solving Methods	3+0	4,5
MKM 339 (Eng)	Introduction to Finite Elementh Method	2+2	5,0
MKM 437 (Eng)	Engineering Materials	3+0	5,0
MKM 440 (Eng)	Introduction to Computer Aided Manufacturing	2+2	5,0
MLZ 307 (Eng)	Phase Diagrams	3+0	4,5
MLZ 314 (Eng)	Transport Phenomena in Materials Processing	4+0	6,0
MLZ 318 (Eng)	Metallic Materials	4+0	4,5
MLZ 413 (Eng)	Powder Metallurgy	3+0	4,0
MLZ 431 (Eng)	Alloys	3+0	4,0
MLZ 433 (Eng)	Thin Film Technology	3+0	4,0
MLZ 434 (Eng)	Aviation Materials	3+0	4,0
MLZ 444 (Eng)	Welding Technologies	3+0	4,0
MLZ 445 (Eng)	Phase Transformations in Metals and Alloys	3+0	4,0
MLZ 450 (Eng)	Computational Materials Science	3+0	4,0
MLZ 454 (Eng)	Smart Materials	3+0	4,0
MLZ 456 (Eng)	Phsysical Properties of Nanomaterials	3+0	4,0
MTR 401 (Eng)	Mechatronics	2+2	5,0

ELECTIVE COURSES

ALM 255 (Ger)	German I	3+0	4,0
ALM 256 (Ger)	German II	3+0	4,0
ALM 357 (Ger)	German III	3+0	4,0
ALM 358 (Ger)	German IV	3+0	4,5
BEÖ 155	Physical Education	2+0	2,0
FOT 202	Photography	2+0	3,0
FRA 255 (Fra)	French I	3+0	4,0
FRA 256 (Fra)	French II	3+0	4,0
HUK 252	Labor Law	2+0	2,5
HUK 458	Industrial Rights and Technological Development	3+0	3,0
İKT 209 (Eng)	Money and Banking	3+0	5,0
İLT 201	Interpersonal Communication	3+0	4,5
İSN 309	Mass Media	3+0	3,0
İSP 151 (Spa)	Spanish I	4+0	4,0
İSP 152 (Spa)	Spanish II	4+0	4,0
İŞL 101 (Eng)	Introduction to Business	3+0	4,5
İŞL 103 (Eng)	Business Management	3+0	3,5
İŞL 201 (Eng)	Business Organization	3+0	4,0
İŞL 302 (Eng)	Production Management and Systems	3+0	4,5
İŞL 321	Applied Entreprenneurship	3+1	5,0
İŞL 454 (Eng)	Management of Technology	3+0	4,5
İTA 255 (İta)	Italian I	3+0	4,0
İTA 256 (İta)	Italian II	3+0	4,0
KÜL 199	Cultural Activities	0+2	2,0
MÜH 402 (Eng)	Engineering Ethics	2+0	3,0
MÜH 404 (Eng)	Innovation Management	3+0	3,0
MÜZ 151	Short History of Music	2+0	3,0
MÜZ 157	Traditional Turkish Art Music	2+0	2,0
PSİ 102	Psychology	3+0	3,5
PZL 211 (Eng)	Principles of Marketing	3+0	5,0
PZL 302	Marketing Management	3+0	4,5
RUS 255 (Rus)	Russian I	3+0	4,0
RUS 256 (Rus)	Russian II	3+0	4,0
SNT 155	History of Art	2+0	2,0
SOS 154	Man and Sociology	2+0	3,0
THU 203	Community Services	0+2	3,0
TİY 121	Introduction to Theatre	2+0	3,0
TİY 152	Theatre	2+0	2,5
TİY 308	Republic Era Turkish Theatre	2+0	3,0
TOP 102	Surveying	2+2	4,5
TÜR 120	Turkish Sign Language	3+0	3,0

COURSE CONTENTS

ALM 255 German I 3+0 4,0
Greeting Friends; Asking for Someone's Health; Asking for Directions; Asking Where People are From; Making Requests; Asking for Prices; asking for Prices; Asking for Different Kinds of Food and Drink; Formal Sentences Used in Restaurants and Formal Places; Asking For and Telling People about Preferences; Likes and Dislikes; Asking for the Amount of Something and Telling the Amount of Something: Structures Used in Telephone Conversations; Using Appropriate Grammar Forms for the Given Situations.

ALM 256 German II 3+0 4,0
Modal verbs: Können, Müssen, Wollen, Dürfen, Sollen, Mögen; Tenses: Simple Present Tense, Future Tense; Nouns and Types of Nouns; Articles; Singular and Plural Forms: Words that are used as Singular or Plural only, Plural Form of the Indefinite Article; Cases of a Noun: Uninflected Case, Accusative, Dative, Possessive Cases; Exercises about these Grammar Points.

ALM 357 German III 3+0 4,0
Expressing a Request; Expressing Regret; Accusing Someone and Apologizing, Describing People, Asking about Someone's Health; Serious Illnesses and Learning about Human Body; Getting Surprised; Responding in Misunderstandings; Explaining Someone Something; Requesting Something from Somebody; Giving Opinions about Furniture; Expressing Opinions about Pictures, Clothes and People; Using Appropriate Grammar Forms for the Given Situations.

ALM 358 German IV 3+0 4,5
General Review of Noun Cases: Strong and Weak inflection, Mixed inflection, inflection Groups, inflection of the Words Which are not German in Origin; Adjectives: Use of Adjectives, Adjective Phrase, Use of Adjectives Depending on the Verb, Adjectives and Cases of a Noun, Types of Adjectives; Comparing Adjectives: Verbs; Groups of Verbs, Verb Forms, Regular Verbs; Tenses: Present Continuous Tense, Past Perfect Tense, Future Tense, Future Perfect Tense.

ANA 121 Human Anatomy and Kinesiology 4+0 5,0
Anatomical Terms and Concepts: Planes, Axials; Anatomical Structures for Sportive Movements: Muscles, Joints, Bones; The Basic Structures of Human Body: Cell, Tissue, Organs and structures of systems; Functions of Muscles When They Contract and Their Joint Movements; The Muscles Which are Take Part in Movements: Upper extremity muscles, Elbow joint muscles, Lower extremity muscles, Muscles which effect the hip and knee joint.

ARK 108 Archaeology 2+0 2,0
Definition; Social, cultural and historical role of archaeology; Domain of Archaeology; Age of the World; Production of the Earliest Stone Tools; Scientific Disciplines Revenant to Archaeological Studies; Brief History of Archaeological Excavations; Historical Classification and History of Anatolia: Prehistoric Ages, Historical Ages, Archaeological sites of Anatolia, Archaeological excavations in Anatolia; Archaeological Activities of University.

ARY 202 Research Techniques 3+0 5,0

Science: Definition of science, Scientific research, Technical approaches in scientific research; Research: Stages of a research, Types of research, Data collection techniques in research; Question: Definition of question, Types of question, Question forms in research, Preparation of the forms using computers: Analysis of the results: Evaluation of question forms using computer, Statistical analysis of the research results, Computer output of research results; Report writing; An Application of Research Planning.

BEÖ 155 Physical Education 2+0 2,0

Definition of Physical Education and Sports; Aims, Disadvantages of Inactive Life; Various Activities for Physical Education; Recreation; Human Physiology; First Aid; Sports Branches: Definition, Rules and Application; Keep Fit Programs.

BİL 158 Fundamentals of Information Technology 2+2 4,5

Introduction to Information Technology; Information Age and Information Society; Information Systems; Concept of Algorithms: Definition; Basics of Algorithm; Computer Organization; Operating Systems: Definition, Functions, Types of operating systems; Computer Software: Word-processing, Reports and spreadsheet, Drawing, Presentation; Database Concepts: Definition, Types of databases, Data communications and Computer Networks; e-mail, FTP, Internet and www; Definition, Usage of Internet; Seeking Information ; Accessing Information.

BİL 200 Computer Programming 2+2 6,0

Procedural and Functional Programming Concepts; C Programming Environment and Compilers; Basic C Commands and Variables; Algorithm Flow; Logic Expressions; Functions; Arrays and Pointers; Function I/O Interfaces; Files; Memory Allocation and Data Structures; Advanced Topics.

BİL 255 Advanced Computer Programming 3+0 4,5

Variables and Constants; Arithmetic Expressions; Arrays; Vector and Matrix Classes; Logical Expressions and "if - else" Statements; Iterative Statements: While, For do-while, Switch statement, Implementation with C/C++ Programming Language.

BİL 301 Computer Programming in Engineering 2+1 3,5

Fundamentals of Programming; General MATLAB Operations; Commands; Matrix Operations and Vectors in MATLAB; Numerical Solutions with MATLAB: Root finding, Optimization, Interpolation, Integration, Differential Equations; Data Files in MATLAB: Creating, Reading from files, File types; M-files: Creating and using M-file functions; Programming with M-files: Program control commands, Conditional control, Loop control; Graphics; Engineering Applications Using MATLAB.

BİL 409 Decision Support Systems 3+0 6,0

Rational Decision Making and Appropriate Data Support; Components of Decision Support Systems (DSS): Data, Information, Databases, Dbms, Knowledgebase, Data Warehouses, Rulebase/Modelbase; Expert Systems Mechanism and Certainty Factors, System Dynamics and Simulation, Group DSS, Executive Information Systems, User-Interface Components; Designing, Implementation and Evaluation of DSS.

BİL 473 Foundation Engineering and Computer Applications 3+0 4,5

Foundation Engineering: Principles and Applications; Problems of Constructions and Computer Applications; Surface and Deep Base Selection; Resistance Capacity and Computer Applications; Stability Problems: Definitions, Types, Solution; Computer applications; Case Studies of Civil Engineering Applications.

BİL 473 Foundation Engineering and Computer Applications 3+0 4,5

Foundation Engineering: Principles and Applications; Problems of Constructions and Computer Applications; Surface and Deep Base Selection; Resistance Capacity and Computer Applications; Stability Problems: Definitions, Types, Solution; Computer applications; Case Studies of Civil Engineering Applications.

BİL 486 Computer Applications in Environmental Engineering 2+1 3,0

Frequently used Software in Environmental Engineering; Numerical Solutions to Frequently Encountered Equations and Comparison with Analytical Solutions; Solving Differential Equations and Matrix Operations with Computer Programs; Correlation and Regression; Time Series Analysis; Use of Selected Environmental Modeling Packages: Stream modeling with QUAL2E, Simulation of wastewater treatment operations and processes.

BİL 810 Computer Applications in Civil Engineering 2+2 4,5

MS Word program; Font, paragraph and page manipulations, Inserting figures & tables, Creating sections of a technical document, Indexing. MS Excel; Cells, arrays and matrices, Functions (built in Excel functions and writing mathematical expressions), Creating figures and tables, Figure tools (best fit, customizing the figureetc). MS PowerPoint; Generating, arranging and customizing slide, Rules for effective presentation visuals, Presentation basics. Case studies in Civil Engineering; Sta4 Cad, Sap 2000, Plaxis 2D, Primivera, Swere Cad, Pond Cad.

BİL 810 Computer Applications in Civil Engineering 2+2 4,5

MS Word program; Font, paragraph and page manipulations, Inserting figures & tables, Creating sections of a technical document, Indexing. MS Excel; Cells, arrays and matrices, Functions (built in Excel functions and writing mathematical expressions), Creating figures and tables, Figure tools (best fit, customizing the figureetc). MS PowerPoint; Generating,

arranging and customizing slide, Rules for effective presentation visuals, Presentation basics. Case studies in Civil Engineering; Sta4 Cad, Sap 2000, Plaxis 2D, Primivera, Swere Cad, Pond Cad.

BİL 813 Computer Programming in Engineering 2+2 4,5
Fundamentals of Programming; General MATLAB Operations; Commands; Matrix Operations and Vectors in MATLAB; Numerical Solutions with MATLAB: Root finding, Optimization, Interpolation, Integration, Differential Equations; Data Files in MATLAB: Creating, Reading from files, File types; M-files: Creating and using M-file functions; Programming with M-files: Program control commands, Conditional control, Loop control; Graphics; Engineering Applications Using MATLAB.

BİM 101 Computer Programming I 3+2 7,0
Computer Basics: Software, Hardware, Operating Systems; Number Systems: Decimal, Binary, Octal, Hexadecimal; Algorithms; Flowcharts; Program Coding and Programming with Java: Primitive Data Types and Operations, Selection Statements, Looping Constructs; Basic I/O Operations: Reading from Keyboard; Printing to Screen; Methods; Arrays.

BİM 102 Computer Programming II 3+0 6,0
Objects and Classes; Strings and Text I/O; Object Oriented Programming Concepts: Inheritance, Encapsulation, Polymorphism; Abstract Classes and Interfaces; Inner Classes; GUI Basics and Event Driven Programming; Exception Handling.

BİM 122 Discrete Computational Structures 3+0 5,0
Fundamentals of Logic; Set Theory and Mathematical Logic; Methods of Proof; Mathematical Induction; Relations; Functions; Cardinality and Countability; The Duality Principles; Homomorphism and Isomorphism; Boolean Algebras; Graph Theory; Trees; Matrix Representations; Introduction to Algebraic Structures; Lattices; Groups: Semigroups, Monoids; Finite State Machines and Languages.

BİM 203 Logic Design 4+0 6,0
Digital Systems and Information: Number systems, Arithmetic operations, Base conversions; Gate Circuits and Boolean Equations: Binary logic and gates, Boolean algebra, Standard forms; Circuit Optimization: Cost criteria, Karnaugh maps; Implementation Technology and Logic Design: Design procedure, Mapping; Combinational Functions: Encoder, Decoder, Multiplexer; Arithmetic Functions: Addition, Subtraction, Multiplication, Division, Signed numbers; Storage Elements: Latches, Flip-flops; Sequential Circuit Analysis: State tables, State diagrams, Mealy and Moore models; Sequential Circuit Design; Counters and Registers.

BİM 204 Numeric Analysis for Computer Engineers 3+0 3,5
Numeric Analysis in General: Solution of Equations by Iteration, Interpolation, Spline Interpolation, Numeric Integration and Differentiation; Numeric Linear Algebra: Linear Systems, Least Squares Method, Eigenvalue Problems, Tridiagonalization and QR-Factorization; Numeric Analysis for Ordinary Differential Equations and Partial Differential Equations: Methods for First/Higher Order Ordinary Differential Equations, Methods for Elliptic/Hyperbolic/Parabolic Partial Differential Equations.

BİM 207 Computer Programming III 2+2 6,0
PATH and CLASSPATH Environment Variables; Java Command-line Switches: -classpath, -class, -server, -jar; Version Control Systems: Git, GitHub; Build Tools: Maven, Gradle; Generics: Bounded type parameters, Wildcards; Java Database Connectivity (JDBC): Prepared statements, Transactions; Software Testing: Unit testing (JUnit); JavaFX Graphical User Interface (GUI): Event-driven programming and animations, JavaFX UI controls and multimedia.

BİM 208 Computer Programming IV 3+0 5,5
Java Garbage Collection Basics; JVM Options for Garbage Collection Tuning: -Xms, -Xmx, -Xms, -XX: (PermSize), -XX: (MaxPermSize); GC Profiling/Monitoring with Java Visual VM; Regular Expressions: Pattern, Matcher; Java Concurrency: Thread object, Thread pools, Executors, Synchronization, Immutable objects; Annotations: Declaring an annotation type, Type annotations and pluggable type systems; Java SE 8 Streams and Lambda Expressions.

BİM 209 Principles of Software Design and Development 3+0 6,0
Object-Oriented Programming Concepts; Object-Oriented Design Principles; Needs Analysis; Functionality Analysis; Textual Analysis; Domain Analysis; Commonality Analysis; Concepts of High Cohesion and Loose Coupling; UML Diagrams; Class Diagrams; Use-Case Diagrams; Software Architecture; Test-Driven Development; Feature-Driven Development; Writing Test Scenarios; Defensive Programming.

BİM 211 Visual Programming 2+2 6,0
Basic Structure and Environment of Visual Programming; Basic Tools of Visual Basic Environment; Project: Characteristics and Help System; Form Design; Controls; Menus; Events and Methods; Data Types; Arrays; Functions; Subroutines and Modules; String and Character Operations; Sample Programs with Different Features; Use of Multiple Forms; Use of Files; Sample Programs on Files; Use of Databases; Sample Applications on Databases.

BİM 213 Data Structures and Algorithms 2+2 5,5
Introduction; Classification of Data Structures; Primitive Data Structures; Arrays and Strings; Abstract Data Types; Data Representation; Formula Based and Linked Representation; Stacks; Recursion; Queues; Linked Lists; Circular Linked Lists; Double Linked Lists; Trees; Binary Trees; Traversal Functions on Binary Trees; Representing

Lists as Binary Trees; Search Algorithms; Tree Searching; AVL Trees and Searching; Red-Black Trees; B-Trees; Multiway Search Trees.

BİM 222 Internet Programming 3+0 4,5
Introduction to Hyper Text Markup Language (HTML 4); Cascading Style Sheets (CSS); Javascript ? Introduction; Javascript - Control Structures; Javascript ? Functions; Javascript ? Arrays; Javascript ? Objects; Dynamic HTML; DHTML - Object Model and Collections; DHTML - Event Model; Introduction to XML; Creating Markup with XML; XML - Document Type Definition (DTD) and Schemas; XML - Document Object Model; XML Path Language; XSL: Extensible Stylesheet Language Transformations (XSLT).

BİM 224 Object-Oriented Programming 3+0 5,5
Introduction to Object Oriented Programming; Principles of Object Oriented Design; Components and Behavior; Software Components; C++ Standard Library; Function Overloading; Function Templates; Encapsulation; Data Abstraction and Classes in C++; Constructors and Destructors; Default and Pure Constructors; Dynamic Memory Allocation; Friend Functions and Friend Classes; Inheritance; Protected Members; Base and Derived Classes; Virtual Functions and Polymorphism; Definition of Polymorphic Behavior; Virtual Destructors; C++ Templates.

BİM 302 Computer Networks 3+0 4,5
Essentials of ISO Reference Model: Logic of multi-layered network; Fundamentals of Physical Layer: Bit-Rate, Baud-Rate, Modulation, Encoding; Fundamentals of Data Link Layer: Encapsulation, Framing, CDMA/CD; Network Layer Protocols: IPv4 and IPv6, Forwarding, Routing, Multicating; Transport Layer Protocols: UDP, TCP, SCTP, Flow control, Congestion control, Reliable packet delivery techniques; Application Layer Protocols: HTTP, FTP, SMTP, P2P file sharing protocols.

BİM 303 Microcomputers 3+2 7,0
Introduction to Microcomputers: Microprocessor, Memory, I/O, Buses; Programming Structure and Software Development Flow: Low and high level programming languages, Software development tools; Architecture of Microprocessor: Basic instruction cycle, Registers; Addressing Modes: Data addressing, Program memory addressing, Stack memory addressing; Instructions: Instruction format, Data movement instructions, Arithmetic and logic instructions, Program control instructions; Memory Interface: Memory connections, Memory types, Error correction; I/O Interface: Isolated I/O, Memory mapped I/O, Handshaking, Serial and parallel communication; Interrupts: Polling and interrupt, Types of interrupts; Microprocessor Performance; Floating Point Arithmetic.

BİM 304 Computer Algorithm Design 3+0 6,0
Introduction; The Role of Algorithms in Computing; Algorithms as a Technology; Sorting; Analysis of Sorting Algorithms; Heap Sort and Quick Sort; Algorithm Performance Analysis; Space Complexity; Time Complexity; Asymptotic Notations: , and notations; Arrays and Matrices; C++ Classes: Arrary1D, Array2D, Matrix; Stack and Queue Manipulation Algorithms; Trees; Binary Trees; Abstract Data Type for Trees; Tree Traversal Algorithms; Graphs; Graph Search Methods; Algorithm Design Techniques; The Greedy Method; 0/1 Knapsack Problem; Divide and Conquer Method; Merge Sort; Branch and Bound Method; Traveling Salesperson Problem.

BİM 305 Computer Organization 3+0 5,0
Performance: Measuring performance, Performance metrics, SPEC benchmarks, Comparing and summarizing performance; MIPS Instruction Set Architecture; Arithmetic for Computers: ALU design, Integer multiplication and division, Floating point operations; The Processor: Single cycle datapath design, Controller design for a single cycle datapath, Multicycle datapath design, Controller design for a multicycle datapath; Pipelining: A pipelined datapath and its control, Data hazards and forwarding, Data hazards and stalls, Branch hazards; Caches: Basics of caches, Measuring and improving cache performance.

BİM 306 Operating Systems 3+0 4,5
Operating Systems; History of Operating Systems; Process Concept: States and Process Control Blocks; OS Kernel; Concurrent Processes; Mutual Exclusion; Process Synchronization; Semaphores; Memory Management and Scheduling; Fixed and Multiple Partitioned Multiprogramming; Virtual Memory; Paging and Segmentation; On Demand Paging and Segmentation; Operations on Moving Head Disks; Disk Scheduling Policies; File and Database Systems; File System Functions; Blocking and Buffering; File Organization; Back-up and Optimization; Database Systems and Models, Case Studies: UNIX, NT, LINUX.

BİM 308 Web Server Programming 3+0 6,0
Web-Based and Client-Based Programming; Publishing Web Pages; Comparison of HTML Pages and ASP Pages; IIS and Management of Web Sites; Web-Based Programming Languages and Tools; .NET Framework; Common Language Runtime (CLR); ASP.NET v2.0: Building a web application, Performing data access, Form input controls, Master pages, Storing user profiles, Caching for performance, Internationalizing, User controls, Session and application variables; Web Services: XML, SOAP protocol, Web services returning various data types.

BİM 309 Artificial Intelligence 3+0 4,5
Introduction to Artificial Intelligence; Intelligent Agents; Solving Problems by Searching; Search Strategies; Constraint Satisfaction Problems; State Space Search; Data-Driven and Goal-Driven Search; Heuristic Search; Informed Search Methods; Agent Based on Logical Reasoning in Building a Knowledge Base; Inference in First-Order Logic; Uncertainty; Probabilistic Reasoning Systems; Machine Learning; Inductive Learning; Decision Trees; Knowledge in Learning.

BİM 311 Systems Analysis and Design 3+0 4,5
Introduction to the Concept of System and General Specifications of Systems: Analysis, Design, Implementation of information systems; Feasibility Work; Management Concepts; Data and Information; Determination of Information Requirements; Methods and Tools of Systems Analysis; Structured Tools; Integration of Phases in Information Systems Development; Information Systems Development Methodologies; User Interface; Importance of Maintenance; Some Case Studies on Information Systems Applications.

BİM 312 Database Management Systems 3+0 6,0
Database; Database Management Systems; Basic Concepts and Definitions; Database Architecture: External level, Conceptual level and Internal level; Schemas; Data Independence; Data Models: Entity-Relationship model, Hierarchical model, Network model, Relational model; Dependencies between Attributes; Normal Forms; Design Criteria; Hierarchical Database Systems; Network Database Systems; Relational Database Systems; Data Definition; Data Manipulation; Query Languages; Relational Algebra Operators; Relational Calculus; Examples of Relational Query Languages: SQL, QUEL, QBE; Operational Requirements: Security, Integrity, Accuracy, Concurrency, Performance.

BİM 313 Advanced Programming Techniques 3+2 6,0
Introduction to Programming Techniques; Introduction to Programming in Java; Control Statements; Working with Objects; Creating Classes and Applications; Object Oriented Programming; Interfaces; Abstract Classes and Multiple Inheritance; Exception-Handling; Streams and I/O Programming; Multithreading; Java Database Connectivity (JDBC); Network Programming.

BİM 314 Theory of Computation 3+0 4,5
Formal Languages; Grammars and the Chomsky Hierarchy; Regular Expressions; Finite State Machines; Mealy and Moore Models; Machine Congruence and State Reduction; Deterministic and Non-deterministic Automata; Push-down Automata and Context-free Grammars; Turing Machines and Computability; Introduction to Coding; Group Codes.

BİM 316 Introduction to Computer Aided Design 2+2 4,0
Introduction to basic fundamentals with solid works and Interface (Sketch); Modeling of simple cast parts; Pattern feature; Revolved feature; Shells and Ribs editing; Repairs; Versatile design options with different engineering parameters; Recalling technical drawing principles; Introduction to finite element analysis (FEA) and its use in design of parts; Strength analysis and mechanics of materials with application of FEA tool in solid works; Contact point strain analysis; Monitoring; Interpretation and evaulation of the results obtained.

BİM 405 Project Management 3+0 4,5
Fundamental Concepts; Planning and Supervision Needs; Steps of a Project; Feasibility Studies; Cost-effect Analysis; Writing a Project Report; Budget Planning; Forming a Project Team; Project Management Techniques; Charts: PERT, CPM, Gantt; Writing a Project Proposal and Report.

BİM 411 Decision Support Systems 3+0 3,0
Rational Decision Making and Appropriate Data Support; Components of Decision Support Systems (DSS): Data, Information, Databases, Database management systems, Knowledgebase, Data Warehouses, Rulebase/Modelbase; Expert Systems Mechanism and Certainty Factors; System Dynamics and Simulation; Group DSS; Executive Information Systems; User-Interface Components; Designing of DSS; Implementation of DSS; Evaluation of DSS.

BİM 423 Software Engineering 3+2 6,0
System Theory; Characteristics and Problems of Large Software Projects; Software Development Life Cycle; Software Development Models; Software Standards; Planning and Management of a Software Project; Software Requirements; Software Design; Software Implementation and Coding; Software Testing; Software Installation; Software Maintenance; Software Documentation; Software Quality Assurance and Management; Overview of CASE Technologies.

BİM 437 Computer Engineering Design 1+2 4,0
Applications of Programming languages, Management information systems, software engineering, parallel and distributed systems, project management, algorithm analysis and design, neural networks, signals and systems, and Microprocessors concepts to everyday life problems using a design and implementation based project .Seminars on comtemporary software and their applications.

BİM 439 Applications of Database Management Systems 3+0 4,5
Triggers and Active Databases; Physical Data Organization and Indexing; Transactions; Concurrency Control; Recovery Protocols; Query Processing and Optimization; Database Tuning; Object Databases; Network Storage Systems; Web-based Database Applications; Security and Authorization Models; Data Mining and Data Warehouse.

BİM 441 Introduction to Rough Sets Theory 3+0 4,5
The Concept of Rough Sets; Knowledge Systems; Data Gathering and Digitization; Discernibility Set Approach; Core & Reduction and Reduction Algebra; Decision Rules and Synthesis; Discernibility Matrix and Functions; Decision-based Discernibility Matrix; Decision-based Discernibility Functions; Reduction Algorithms; Solution of Real State Problems by Using Rough Sets.

BİM 444 Computer Engineering Applications 2+4 7,0
Selections from Current Computer Engineering Topics Such As: Programming languages, Management information systems, Software engineering, Parallel and Distributed systems, Project management, Analysis of algorithms, Neural networks, Signals and systems, Microprocessors.

BİM 446 Analysis of Algorithms 3+0 4,5
Algorithm Analysis Techniques: Big-O, Omega, Theta asymptotic notations; Sorting and Searching Algorithms; Selection; Binary and Binomial Heaps; Greedy Algorithms; Dynamic Programming: 0-1 knapsack problem, Chain matrix multiplication, Longest common subsequence; Graphs and Graph Algorithms: BFS, DFS, Topological sort, Shortest path algorithms, Minimum spanning tree algorithms; NP-Completeness: Definition, Cook?s theorem, Reductions; Approximation Algorithms.

BİM 448 Computer Graphics 3+0 4,5
Hardware and Software Components of Graphic Systems; Output and Filled-data Primitives; 2d and 3d Geometric Transformations; Two Dimensional Viewing: Viewing pipeline, Clipping, Windowing; Three Dimensional Viewing: Viewing pipeline, Viewing parameters, Projections, Viewing transformations, Clipping; Visible Surface Detection; Introduction to Illumination Models and Surface Rendering.

BİM 450 Network Management 3+0 4,5
Historical Process of Network Management; Network Management Infrastructure and Architecture; ISO Network Management Architecture and Models: Performance management, Configuration management, End-user account management, Error management, Security management, SNMP; VLANs and their management; Router, Firewall, NAT and ALG setup and management.

BİM 451 Web Server Programming with MVC 3+0 4,5
The Model-View-Controller (MVC) Design Pattern; Creating an MVC Web Application; Adding a Controller: Understanding actions, Mapping routes; Adding a View: The ViewBag object, Layout pages, Razor syntax, Linking to an action; Adding a Model: Working with an OR/M software, Create, Read, Update and Delete (CRUD) operations, GET and POST methods, Partial views, Creating custom display controls, Searching and filtering; Adding Validation; Security; Authentication and Authorization; Internationalization and Globalization.

BİM 452 Multimedia Computing 3+0 4,5
Multimedia Structures and Literature; Characteristics of Information Flow; Multimedia Entities: Voice, Video, Graphics, Text; Image and Graphics: Image processing; Video and Animation: Television, Computerized animation; Information encoding; Compression: Coding standards, Entropy; Video Encoding: JPEG, MPEG, DVI; Optic Storage: Video disks, Compaq disks, VCD, DVD; Multimedia Operating Systems: Multimedia storage, Retrieval, Transmission, Synchronization techniques, Future of multimedia.

BİM 453 Introduction to Machine Learning 3+0 4,5
Introduction to Learning Algorithms; Linear Regression with One Variable; Linear Regression with Multiple Variables; Supervised Learning Algorithms and Classification; Regression and Classification with Neural Networks Models; Decision Tree Learning; Naive Bayes Classifier and Bayesian Networks; Genetic Algorithms; Support Vector Machines for Classification Problems; Hidden Markov Models; Unsupervised Learning Algorithms.

BİM 454 Programming Language Concepts 3+0 4,5
Introduction; Evolution of Programming Languages; Syntax and Semantics of Programming Languages; Formal Methods for Description of Programming Languages; Lexical and Syntactic Analysis; The Parsing Problem; Names; Bindings; Type Checking and Its Scope; Data Types; Expressions and Assignment Statements; Control Structures; Subprogram Mechanism; Abstract Data Types; Design Issues and Examples; Object Oriented Programming; Concurrency Levels; Exception Handling; Functional and Logical Programming Languages.

BİM 455 Introduction to Hardware Design 3+0 4,5
Combinatorial Review; Sequential Review; Verilog: Language, Syntax, Tools, Simulation, Integrated Circuits & PLDs; Packaging Circuit Boards; Interconnection and Signal Integrity; Processor Basics: Embedded computer organization, ALU, Instructions & Data; Memory Organization: Memory interface; Cache memory; I/O Interfacing; I/O Devices; I/O Controllers; Parallel Busses; Serial transmission; I/O Software; Accelerators: General concepts; Case Study: Video edge detection, Verifying an accelerator; Design Methodology.

BİM 456 Network Security Principles 3+0 4,5
Introduction to Network Security; Main Problems in Network Security; Terminology; Active and Passive Attacks; Encryption Methods; Overview of Authentication Systems; One-Way and Mutual Authentication Techniques; Message Integrity Techniques: MD-5, SHA-1, Digital signatures; Network Security Standards: Secure-E-mail (PGP), S-MIME, SSL, TLS, IPSec; Strong Password Protocols; Digital Cash; DoS Attacks, Distributed DoS Attacks.

BİM 457 Embedded Programming Languages 3+0 4,5
Introduction to Embedded Programming Languages; Compiling and Debugging Linux Applications; Introduction to Linux; Linux Kernel; Essential Commands and Tools in Linux; Handling Errors and Exceptions; Bash & Perl Programming; Python Programming; Embedded C Programming; Device Driver Concept; Timing in Linux; Interrupt Handling; Using DMA; Linux File System Concept; Linux and Real Time.

BİM 458 Simulation and Modeling 3+0 4,5
System Theory; Decision Making and Modeling; Simulation Methodologies and Science; Simulation Models; Continuous and Discrete Time Simulation; Selection of Input Probability Distributions; Random Number Generation; Data Analysis of a System Output; Statistical Comparison of Similar Systems; Modeling on Virtual Environment; Virtual Modeling Software; Development of Models by Using Lab View; Sample Model Development with Lab View.

BİM 460 Software Modeling 3+0 4,5
Software Development Methods; Advantages of Object Oriented Programming; Integrated Software Development Processes; Using Models in Software Development; Unified Modeling Language (UML); Requirements Analysis and Use Cases; Activity and Sequence Diagrams; Class Diagrams; Deployment Diagrams; Object Oriented Analysis and Modeling; Object Oriented Design and Modeling; Design Patterns. Software Modeling Applications by Using Software Development Tools.

BİM 462 Parallel Systems 3+0 4,5
Parallel Applications: Weather forecasting; Speedup and Amdahl's Law; Parallel Algorithm Design Techniques: Domain decomposition, Recursive decomposition; Message Passing Computation and Message Passing Interface; Pipelined Computations: Sorting; Synchronous Computation and Barriers; Shared Memory Computation; Distributed Shared Memory; SIMD and Vector Processors; Overview of Parallel Architectures; Interconnection Networks: Bus, Mesh, Hypercube; Cache Consistency Protocols.

BİM 464 Human-Computer Interaction 3+0 4,5
Human Factors in Software Development; Use of Database Systems; Design of Interactive Systems.; Science Bases: Theories, Models, Usability studies, Controlled experimentation; Software Engineering with User Interface Development Environments; Programming and command languages, Menus, Forms, Direct manipulation; Graphical User Interfaces; Computer-Supported Cooperative Work; Information Search and Visualization; Input/Output Devices; Display Design.

BİM 466 Fuzzy Logic 3+0 4,5
Fuzzy Sets and Basic Operations on Fuzzy Sets; Fuzzy Relation and Extension Principle; Linguistic Variables; Fuzzy Logic and Approximate Reasoning; Fuzzy Rule Base; Fuzzy Inference Engine; Fuzzifiers and Defuzzifiers; Fuzzy Systems as Nonlinear Mappings; Design of Fuzzy Systems from Input-Output Data; Table Look-Up Scheme; Gradient Descent Training; Fuzzy Clustering, Neuro-Fuzzy (ANFIS).

BİM 468 Computer Aided Design 3+0 4,5
Use of Computers in Designing; Current Computer-Aided Design Software: Features, Applications; The Use of Computer Aided Design Software with Other Software; CAD; Production of Sample Designs Using CAD; Hardware Requirements for CAD; Menu / Command Structure; Initial Drawing Set-Ups and Prototype Drawings.

BİM 470 Neural Networks 3+0 4,5
Fundamentals of Neural Networks: Neuron model, Neural network structures; Bayes Rules; Fuzzy Sets; Discriminate Analysis; Learning Rules and Tasks; Perception Methods; Single Layer Feedforward Networks; Multilayer Feedforward Networks; Least Mean Square Algorithm; Error Back-Propagation; Radial Basis Function Networks; Associative Memory: Analysis, Design; Functional Link Networks; Pattern Recognition; Relations on Neural Network Methods; Support Vector Machines; Self Organizing Maps.

BİM 472 Image Processing 3+0 4,5
Fundamentals of Digital Image Processing: Visual perception, Image sensing, Image sampling and quantization, Basic relationships between pixels; Image Enhancement in Spatial Domain: Gray level transformations, Histogram processing, Spatial filtering for smoothing and sharpening; Image Enhancement in Frequency Domain: Fourier transform, Frequency-domain filters for smoothing and sharpening, Homomorphic filtering; Image Restoration; Color Image Processing; Wavelets and Multiresolution Processing; Image Compression; Morphological Image Processing.

BİM 474 Introduction to Cryptography 3+0 4,5
Introduction to Cryptography and Encryption Algorithms; Private Key Encryption Algorithms: Data encryption standard, Triple data encryption standard, Advanced encryption standard; Public Key Cryptography; Public Key Encryption Algorithms: RSA, Diffie-Hellman, ElGamal, Public-Private key generation techniques; Conventional Encryption Techniques: Caesar cipher; The Uses of Encryption: Cryptographic hash functions, Key exchange, Certificates.

BİM 476 Data Acquisition and Processing 3+0 4,5
Use of Computers in Data Acquisition; Sensors and Interfaces; Sampling; Noise; Filtering; Computer Measurements; Parallel Input/Output; Interrupt Systems; Timers; Parallel and Serial Data Paths and Transmission; Using Direct Memory Access (DMA) for External Data Communication; Data Transfer; Basic Control Techniques; Real-Time Input Handling Techniques; Knowledge Discovery Process.

BİM 478 Management Information Systems 3+0 4,5
An Overview of Management Information Systems (MIS); MIS as a Tool for Organization Development; Conceptual Fundamentals: Information; System; Planning; Control; Concepts of Organization and Management; Human as Information Processors; Decision-Making Processes; Methods of Selecting an Alternative; Structure of a Management Information System; MIS Support at Operational, Planning, Control, Decision Making, and Management Levels; Determination of Information Requirements; Development; Implementation; and Management of Information System Resources.

BİM 480 Compiler Design 3+0 4,5
Development of the Logical Design of a Compiler: Lexical analyzer, Parser, Semantic analyzer, Code generator, Code optimizer, Error recovery routines; Analysis of Formal Algorithms for Each Component; Description of Overall Compiler Construction Techniques; Code Analysis and Optimization Techniques.

BİM 482 Network Programming 3+0 4,5
TCP/IP Stack Overview and Socket Layer; UDP socket programming; POSIX I/O Models: Blocking, Non-blocking, signal driven and asynchronous I/O; Select/Poll System Calls; Multi-Threaded Server Design Techniques; TCP Socket Programming Techniques: Line-driven Protocol Design and Implementation Techniques; Socket Options; Broadcasting and Multicasting Applications.

BİM 484 Distributed Systems 3+0 4,5
Distributed System Architectures; Goals: Transparency, Scalability, Fault tolerance, Replication; Remote Procedure Calls and Remote Object Invocation; Naming: X.500; Synchronization: Clock synchronization; Mutual Exclusion; Consistency and Replication Techniques; Fault Tolerance; Distributed Object Systems: DCOM, CORBA; Distributed File Systems: NFS, AFS, XFS, CODA, Network attached storage devices (NASD).

BİM 485 Research in Computer Science I 3+0 4,5
Preparing students for research in Computer Science; Participating in academic research under advisement; Research in Computer Networks: Peer-to-Peer Networks, Overlay Networks, Quality of Service Protocols, Sensor Networks, Voice over IP Protocols; Research in Information Retrieval: Information Extraction, Text Classification, Clustering; Learning in High Dimensional Spaces; Research in Data Mining: Data pre-processing, Association Rule Mining, Classification, Clustering, Prediction, Collaborative Filtering; Research in Artificial Intelligence and Fuzzy Systems; Expert Systems; Approximate Reasoning; Fuzzy Logic; Fuzzy Reasoning; Fuzzy Inference Systems; Function Approximation; Time Series Prediction.

BİM 486 Research in Computer Science II 3+0 4,5
Preparing students for research in Computer Science; Participating in academic research under advisement; Research in Parallel and Distributed Systems: Storage Architectures and File Systems; Grid Computing; Agent-based Computing; Research in Natural Language Processing: Turkish Text Analysis, Morphological Analysis; Search and Ranking Algorithms; Learning Approaches to Ranking; Research In Data Mining with Privacy: Privacy, Distributed Data-based Data Mining Tasks with Privacy, Privacy-preserving Data Mining, Privacy-preserving Collaborative Filtering; Research in Neural Networks: Multi-layer Perception, Recurrent Neural Networks, Fuzzy Neural Networks, Wavelet Neural Networks; Function Learning.

BİM 488 Introduction to Pattern Recognition 3+0 4,5
Components of Pattern Recognition System: Pattern, Feature Extraction, Classification; Probability and Linear Algebra; Bayes based Classifiers: Bayes Classifier, Naïve Bayes Classifier, Minimum Distance Classifiers; Linear Classifiers: Linear Discriminant Analysis, Perceptron Algorithm; Nonlinear Classifiers: Decision Trees; Analysis of Classification Performance; Text Recognition; Speech Recognition; Image Recognition.

BİM 490 Introduction to Information Retrieval 3+0 4,5
Boolean Retrieval; Term Vocabulary; Posting Lists; Index Construction; Index Compression; Scoring; Term Weighting; Vector Space Model; Evaluation in Information Retrieval; Relevance Feedback; Query Expansion; XML Retrieval; Language Models; Text Classification; Clustering; Web Search.

BİM 492 Design Patterns 3+0 4,5
Essential Elements of Design Patterns: Pattern Name, Problem, Solution, Consequences; Object-Oriented Design Principles: Polymorphism, Abstraction, Classes, Encapsulation; Observer Pattern; Template Method Pattern; Factory Pattern; Singleton Pattern; Iterator Pattern; Composite Pattern; Facade Pattern; State and Strategy Patterns, Functors and Command Patterns; Proxy Pattern; Adapter Pattern; Decorator Pattern; Chain of Responsibility Pattern.

BİM 493 Mobile Programming I 3+0 4,5
Mobile Computing: Mobile computing platforms, Smart devices, Mobile development environments, Android Overview; Android Environment SDK; Environment Emulator and Applications Life Cycle; User Interfaces; XML Layouts; Selection Widgets; Date-Time Tabs; Hard and Soft Keyboard; Fonts; Menus; The WebKit Browser; Intents; Inter-Process Communication Using Bundles; Multi-Threading.

BİM 494 Mobile Programming II 3+0 4,5
External Resources; Location Based Services; Working with MapViews; Services and Broadcast Receivers; Notifications and Intent Filters; Telephony and SMS; Sensors; Touch and Gestures; SQL Databases; Bluetooth Communication; Network Connectivity and WiFi.

BİM 496 Computer Vision 3+0 4,5
Image Formation and Image Sensing; Binary Images: Geometrical properties, Topological properties; Regions and Image Segmentation; Image Processing: Edge detection, Contour extraction, Color; Motion Field and Optical Flow; Stereo Correspondance; Three-dimensional Image Analysis: Shape from shading, Reconstruction from projections; Pattern Classification and Object Recognition; Tracking.

BİM 498 Embedded Software Design 3+0 4,5
Introduction to Embedded Systems: What is an embedded system? Real-time embedded systems, Embedded system design examples, Development environment, The C language; Compiling & Debugging: Compile process, Cross-compilers, Debug monitors, Remote debuggers, Emulators; Hardware Fundamentals & Peripherals: Control and status registers, Device driver philosophy, GPIO's, Serial Port, Ethernet, USB; Interrupts: Overview, Priorities, ISR; Embedded Linux: Operating system fundamentals, Kernel architecture, Boot sequence, System initialization, The Scheduler, System programming, Process management, Synchronization.

BİY 353 Environmental Microbiology 3+0 4,5
Description of Microorganisms: Bacteria, Blue-green algae, Viruses, Fungi; Environmental Needs; Growth: Growth of microorganisms, Monod kinetics, Quantitative measures; Microbiological Control: Physical and chemical methods, Chemotherapeutics; Applied Microbiology: Natural water, Drinking water, Wastewater, Microbiological pollution, Treatment; Microorganisms in Air and Investigation Methods; Industrial Microbiology: Fermentation, Biosynthesis; Use of Microorganisms: Food, Biogas, Metal leaching, Production of petroleum.

BİY 357 Environmental Microbiology Laboratory 0+3 2,5
Presentation of Material and Equipment that are Used in Microbiological Investigations; Sterilization and Disinfection; Various Media and Preparation Methods; Preparation Techniques for Microorganisms; Coloring and Examination Methodology of Microorganisms; Size Measurements of Microorganisms; Determination of Microorganism Numbers (Enumeration); Examples of Microorganisms in Water, Air and Soil; Presentation of Microorganisms that are Used in Biological Treatment.

ÇEV 203 Introduction to Environmental Engineering 2+0 3,5
Scope, Definition and Historical Development of Environmental Engineering; Overview of Environmental Engineering and Education; Fundamental Concepts; Introduction to Various Forms of Water, Air and Soil Pollution; Pollutants and Their Characteristics; Introduction to Water and Wastewater Treatment; Overview of Air Pollution and Control; Solid Wastes: Disposal and Reuse; Overview of Global Environmental Problems; Technical, Economic and Organizational Considerations of Environmental Quality.

ÇEV 206 Environmental Chemistry II 3+0 4,5
Carbonate Chemistry in Natural Water and Wastewater; Nitrogen Species in Water and Wastewater: Ammonification, Nitrification, Denitrification, Nitrogen Fixation; Phosphorus and Detergents; Chemical Oxygen Demand, Biochemical Oxygen Demand and Its Kinetics; Natural and Synthetic Organics in Water and Wastewater; Colloidal Chemistry and Colloids: Formation and species, Charge acquisition, Destabilization and aggregation; Introduction to Atmospheric Chemistry; Important Anthropogenic Air Pollutants.

ÇEV 209 Technical English I 3+0 2,5
Technical Vocabulary for Environmental Sciences and Environmental Engineering; Readings of Selected Passages from Environmental Engineering Literature; Translation of Passages Related to Topics in Environmental Sciences and Engineering from English to Turkish.

ÇEV 210 Technical English II 2+0 2,0
Translation of Passages Related to Topics in Environmental Sciences and Engineering from Turkish into English; Explanation of Words and Terms Used Frequently in Environmental Sciences and Engineering and Their Use in Sentences; Use of Visual Materials in Class With Active Participation of Students; Short Presentations in English Based on Visual Materials and Selected Passages From Literature; Technical Report Writing.

ÇEV 211 Environmental Chemistry Laboratory I 0+3 3,0
General Rules of Environmental Chemistry I Laboratory; Laboratory Safety; Overview of Environmental Analyses; Fundamental Concepts and Information about the Equipment and Materials Used in Environmental Chemistry I Laboratory; Calculation of Measurement Uncertainty in Chemical Analyses; Installation of Experimental Systems and Preparation of Solutions; Standardization of Solutions Used in the Laboratory; Physical and Chemical Analyses in Natural Water and Wastewater: Gravimetric analysis, Conductivity analysis, Acidity and alkalinity analysis, Hardness analysis, Chloride analysis, Turbidimetric sulphate analysis, Chlorine analysis.

ÇEV 212 Environmental Chemistry Laboratory II 0+3 3,0
General Rules of Environmental Chemistry II Laboratory; Fundamental Concepts and Information about the Equipment and Materials Used in Environmental Chemistry II Laboratory; Installation of Experimental Systems and Preparation of Solutions; Heavy Metal Analysis in Solid Materials; Physical and Chemical Analyses in Natural Water and Wastewater: Boron, Oil and grease, Total Kjeldahl nitrogen, Phosphorus, Biochemical oxygen demand, Chemical oxygen demand; Principles of Sampling in Water and Soil and Multi-analysis Applications in Composite Samples.

ÇEV 213 Environmental Chemistry I 3+0 4,5
Description of Environmental Chemistry: Formation, availability, and distribution of elements on earth, ; Organic and Inorganic Compounds in Environmental Engineering and Their Nomenclature; Concentration Units and Stochiometric Calculations; Analysis Techniques, Calculation of Ion Intensity; Oxygen Solubility: Henry's law, Equalization of reactions, Rates of reactions, Equilibrium; Preparation of Solutions, Acids and Bases; Acids with Single and Multiple Protons and Calculations of pH; Analysis Techniques in Environmental Engineering: Introduction to laboratory methods and essential principles, Solubility in chemical treatment, Buffer solutions, Hardness, Ion exchange and resins, Chemistry of sulphur, Chemistry of nitrogen, Acidity, Alkalinity, Chemistry of chlorine and disinfection.

ÇEV 219 Ecology 3+0 4,5
Basic Rules and Concepts in Ecology; Autoecology: Abiotic factors and Effect of organisms, Terrestrial factors, Biological relations; Demecology: Descriptions and features of population structure, Quantitative changes; Dynamics of Populations: Species groups ecology; Community and Features; Ecosystem and Its Features; Matter Cycles in Ecosystems: Applied ecology; Environmental Ecology;

Ecological Balance and Protection of Biological Diversity; Environmental Health.

ÇEV 305 Unit Operations and Processes I 4+0 6,0
Mass and Energy Balances; Flow Models and Reactors: Batch and continuous flow reactors, Completely-mixed reactors, Plug-flow reactors; Water and Wastewater Treatment Plants; Unit Operations and Processes in Water and Wastewater Treatment; Screening; Grit Removal; Flow Equalization; Neutralization; Coagulation and Flocculation; Sedimentation; Filtration; Flotation; Adsorption; Ion Exchange; Membrane Processes; Ammonia Removal.

ÇEV 309 Social Environmental Science 2+0 3,0
Relationship Between Social Science and Environmental Science: Human, Society and Environment; Biopolitics; Origin of Environmental Problems; Modernization and Consumption Society; Current Environmental Problems Approach of Social Science Environment philosophy; Environmental ethics and Bioethics; Environmental Movements and Green Political Thought: Global environmental policies, Environmental policies in Turkey; Approach of Environmental Economy; Urban Environment and Environmental Aesthetic; Ecotourism.

ÇEV 310 Water and Soil Pollution 3+0 4,0
General Definitions in Water and Soil Pollution; Characterization of Water Environment: Water environments (streams, lakes, oceans and groundwaters), Water quality; Water Pollution: Types and sources of pollutants, Organic pollution and eutrophication, Inorganic pollution, Pathogens, Metals and toxic materials: Characterization of Soil Environment; Soil Pollution: Pollutant sources, Fate of pollutants, Transport of pollutants; Agriculture and Erosion: Agricultural pollutants and their effects, Effects of erosion on water and soil quality, Erosion control; Water and Soil Quality Criteria and Standards: Legal aspects of water and soil pollution control.

ÇEV 311 Environmental Economy 2+0 3,0
Environment and Economy: Conceptional Framework, Environmental assets and matter of property; Economic and Politic Approach to Natural Resource and Environmental Problems in the Process of Historical Development: Macroeconomic approach in environment economy, Environment politics and management; Solution Alternatives of Environment Problems: On the basis of legal and market solution; Microeconomic Analyses on Pollution of Environment: Sustainable development ındicators and ındexes, contamination economics regarding to contamination economics and pollution controls; Classification of Resource in Economy; Principles of Utilization From Natural Resources and Economic Developments; European Union Environment Politics.

ÇEV 312 Water Supply and Sewerage 3+0 4,5
Water Quantity: Factors affecting water use, Fluctuations; Population Forecasts and Design Flows; Quality of Water Resources; Relation of Water Quality to Environmental Health; Water Collection and Distribution; Pipes and Pipe Networks: Components, Design, Use, Maintenance; Pipe Networks and Water Quality; Wastewater Quantities: Factors affecting wastewater flows, Fluctuations in flows, Infiltration and inflow, Fluctuations; Stormwater: Quantity and Quality; Sewer Design Flows; Sewer Network: Appurtenances, Design, Construction, Maintenance; Use of Computer Programs in Pipe and Open Channel Network Design.

ÇEV 313 Unit Operations and Processes Laboratory I 0+3 3,0
General Rules of Laboratory; Laboratory Safety; Coagulation: Coagulants and their dosages, Coagulant aids, Jar tests; Flocculation; Sedimentation Test: Type I, II, III and IV settling, Batch settling tests, Data acquisition for primary clarifier design, calculation of settling efficiency; Filtration: Single-medium and multimedia filters, Sieve analysis, Particle density analysis, Determination of bed porosity, Calculation of filterability index, Determination of head loss in filtration columns; Adsorption: Theory of adsorption, Determination of Freundlich and Langmuir isotherms; Membrane Separation: Theory of membrane separation, Electro dialysis test; Ion Exchange.

ÇEV 314 Unit Operations and Processes Laboratory II 0+3 3,5
General Rules of Unit Operations and Processes Laboratory II; Oxygen Transfer: Determination of the effects of different types of waste materials on the coefficient of absorption and oxygenation of a system; Anaerobic Digestion Test: Mass balance in a continuous anaerobic reactor, Effect of pH, Determination of chemical oxygen demand; Determination of alkalinity, Biogas measurement, Determination of mixed liquor volatile suspended solids; Aerobic Digestion Test: Examination of continuous aerobic reactor, Effect of pH, Determination of chemical oxygen demand, Determination of dissolved oxygen, Determination of mixed liquor volatile suspended solid; Design of Batch Anaerobic Reactor; Design of Batch Aerobic Reactor; Flotation Test: Removal of suspended solids and oil.

ÇEV 316 Air Pollution 3+0 4,5
Basic Definitions and Concepts Related to Air Pollution and Control; Air Quality Management; Sources of Air Pollutants; Effects of Air Pollutants: Effects to living and non-living things; Indoor Air Pollution Models; Laws Related to Air Quality Control; Characterization and Monitoring of Air Pollution; Dispersion and Transportation of Pollutants: Horizontal and vertical dispersion of pollutants in the atmosphere and air pollution models.

ÇEV 320 Environmental Problems Resulting from Energy Production 3+0 4,0
Introduction: Energy systems, Transportation and delivery of energy, Efficiency and economics of energy; Electricity Production and Consumption in Turkey; Energy Policy in the European Union and Turkey: Environmental policy in energy production; Air Pollution Resulting from Energy Production: Thermal power plants and their environmental impacts, Environmental disasters in the past; Alternative

Energy Sources and Their Environmental Impacts: Hydrogen, Wind, Biomass, Geothermal, Solar, Nuclear, Hydroelectric, Ocean, Wave, Ocean thermal and Tidal energy.

ÇEV 322 Environment Health 2+0 3,0
Concept of Environment Health: Definition, Subjects, Characteristics; Environment, Human and Health Relation: Ecology of humans, Disease and environment relations, Social, cultural and economical effects; Concept of Environmental Disease and Toxicology: Risk evaluation, Risk transmission; Water, Air and Health Relation: Healthy drinking and usage water, Causes and kinds of water and air pollution, Infection diseases caused by water and air, Control of these diseases, The situation in Turkey; Others Types of Pollution: Soil, Food, Noise, Radioactive material; Urbanization and Health: Urban health, Project of healthy cities; Environmental Health Legislation in Turkey and in the European Union.

ÇEV 324 Unit Operations and Processes II 4+0 6,0
Biochemical Treatment Methods, Biochemical Kinetics; Biological Processes: Activated sludge processes and kinetic equations, Oxygen requirement, Nitrification, Activated sludge coefficients, Rate constants and coefficients in continious-flow biological reactors; Oxygen Transfer and Mixing; Trickling Filters and Rotary Biological Contactors; Stabilization Ponds and Aerated Lagoons; Anaerobic Digestion, Aerobic Digestion; Natural Treatment Systems: Soil Based Systems, Aquatic Systems; Other Unit Operations and Processes: Water treatment, Wastewater treatment;Disinfection: Disinfectants, Disinfection kinetics

ÇEV 326 Information Technologies in Environmental Engineering 3+0 4,0
Information Technologies: General information about informatics; Information technologies in Turkey; Environmental Data Management: Data capture, Data storage, Data analysis and decision support; Information Technologies in Air Quality Modeling and Measurement; Information Technologies in Solid Waste Management and Hazardous Waste Management; Information Technologies in Water Quality Monitoring and Measurement; Information Technologies in Application; Information technologies for environmental impact assessments; National environmental database system practices; Remote sensing practices; GIS practices; Other industrial practices.

ÇEV 328 Instrumental Analysis in Environmental Studies 3+0 4,5
Definition of Instrumental Analysis; Chromatographic methods: General definition of chromatography, Separation the columns, Detectors, Principles of gas chromatography, Principles of liquid chromatography, Use of gas chromatography and liquid chromatography in environmental analysis; Spectroscopic Analysis Methods: Properties of electromagnetic radiation, Electromagnetic spectrum, Emission and absorption of radiation, Instrument components, Atomic absorption and emission, Ultraviolet (UV) and visible (VIS) spectroscopy, Use of spectroscopy in environmental analysis; Sample Handling and Preparation; Errors in Chemical Analysis; Statistical Evaluation of the Analytical Data; Report Writing.

ÇEV 332 Introduction to Ecological Economy 3+0 4,5
What is Ecological Economy; The Global Ecosystem and the Economic Subsystem: Ecosystems and ecological services; Natural resources, Ecosystems, Biodiversity and ecological services, Material and energy flows in ecological and economic systems; Human-Ecosystems Interactions; Sustainability in Ecological Terms; Accounting for natural Capital, Ecological Limits and Sustainability: Sustainable development indicators in ecological economics; Welfare and well-being, Ecological footprint, carbon footprint, Water footprint, Biocapacity, Carrying capacity, Towards a Green Economy: Industrial ecology; Eco- Industriel parks, Green economy and opportunities, Ecological economic assessment and management; Policies, Institutions and Instruments.

ÇEV 408 Water Quality Assessment 3+0 4,0
Sources and Characteristics of Water Pollutants; Characterization of Water Environments; Planning Water Quality Monitoring Programs; Site Selection and Determination of Monitoring Frequency; Selection of Monitoring Parameters; Sampling Methods: Discharge measurement, Sampling physical, chemical and biological parameters; Analysis Methods; Analysis; Reduction of Continuously Monitored Data; Trend Analysis of Water Quality Constituents; Analysis of Completed Monitoring Programs.

ÇEV 409 Experimental Design 3+0 4,0
Utilisation of Statistics in Scientific Work and Engineering Applications; Regression and Correlation: Linear and non-linear correlations, Multiple correlations; Analysis of Variance; Comparison of the Means of Two Different Processes; Steps of Experimental Design and Its Application to Special Problems; 2k and 3k Full Factorial Design; Fractional Factorial Design; Time Series Analysis; Computer-aided Problem Solutions: Utilization of statistical software such as Minitab, SPSS, Statview, etc.

ÇEV 413 Flow Through Porous Media and Modeling 3+0 4,0
Porosity, Tortuosity, Conductance, and Capillarity Concepts; Statics and Transport of Fluids Through Porous Matrix; Darcy's Law and Compressibility Effects; Flow of Heterogeneous Fluids and Unsteady Conditions; Interactions Between Fluid and Solid; Continuity of Mass and Momentum; Thermal Flow; Stochastic Approaches to Transport Phenomena; Simulation Models and Analogies, Transport and Diffusion of Contaminants Through Porous Media.

ÇEV 421 Solid Waste Management 3+2 6,0
Municipal Solid Waste Management: Composition of solid wastes, Physical, chemical and biological properties; National and International Legislation; Collection of Solid Wastes: Analysis of collection systems, Optimization of

collection routes; Integrated Solid Waste Management Principles; Engineering Principles: Minimization, Reuse, Recycle, Composting, Thermal conversion technologies, Sanitary landfill.

ÇEV 423 Applications of Remote Sensing and GIS in Environmental Sciences 3+0 4,5
Definition of Remote Sensing (RS); Brief History of RS; Energy Concept for RS; Principles Electromagnetic Radiation; Radiation-Matter Interaction; Spectral Signatures; Resolution for Remote Sensing; Image Processing; Image Classification; What is Geographic Information Systems (GIS)?; Application of GIS for RS Data; What is Feature and Feature classes?; Types of Digital Graphic Data; What is Topology?; GIS Analyses.

ÇEV 427 Air Pollution Control 3+0 4,5
Air Pollution Control Strategies: Dilution in atmosphere, Process modifications; Resource Recovery; Secondary Control Techniques; Air Pollution Control Methods; Gas and Particle Removal Systems Used at Stationary Emission Sources: Design of particle holders, Absorption, Adsorption, Incineration, Condensation; Sulphur Oxides; Control of Nitrogen Oxides and Volatile Organic Compounds; Air Pollution Control at Combustion and Non-combustion Sources; Control of Motor Vehicle Emissions; Air Pollution Control Applications in Some Industrial Facilities; Economic Analysis of Control Technologies.

ÇEV 431 Water Treatment Project 1+2 4,0
Project Planning: Site selection; Evaluation of Present and Future Conditions; Population Projections; Water Quantity: Fluctuations in water demand; Water quality; Water Supply: Ground and surface waters; Conveyance of Water and Connections; Selection of Units in a WTP Based on Water Characteristics; Design of WTP: Intake structures, Aeration and rapid mixing structures, Flocculation chambers, Sedimentation basins, Filtration beds, Disinfections units and others.

ÇEV 432 Wastewater Treatment Project 1+2 4,0
Project Planning: Site selection, Work plans; Effluent Limits; Evaluation of Present and Future Conditions; Wastewater Parameters to be Considered in Design; Alternative Evaluation: Treatment, Land application, Disposal; Economics: Selection of units in a WWTP based on wastewater characteristics; Design of a WWTP: Screens, Grit chambers, Primary sedimentation, Biological treatment, Disinfections, Sludge thickeners, Anaerobic treatment and others; Personnel Hygiene and Safety.

ÇEV 438 Environmental Management 3+2 6,0
Main Shareholders and Criteria in Decision - making on Environmental Issues; Anthropocentric and Biocentric Approaches; Design of Environmental Regulations; Economic Valuation and Allocation of Environmental Resources; Public Involvement and Resolution of Disputes; Environmental Impact Assessment (EIA) Procedures: Command and control, Pollution discharge fee, Tradable permits; Air and Water Quality Management; Integrated Waste Management; Biological, Cultural and Socioeconomic Impacts of Projects; Environmental Risk Assessment; Strategic Environmental Assessment; Involvement of Geographical Information Systems in EIA Applications.

ÇEV 442 Hazardous Waste Management 3+0 3,0
Fundamentals of Hazardous Waste Management: General definitions, Preparation of MSDS forms, National and international legislation, Fate and transport of contaminants; Toxicology and Risk Management: Toxic effects of hazardous wastes, Dose-response relationships; Pollution Prevention Practices: Management strategies, Life cycle analysis, Volume reduction, Toxicity reduction, Recycling processes; Treatment and Disposal Methods: Physico-chemical processes, Biological methods, Stabilization and solidification, Thermal methods, Landfilling; Case Studies on Industrial Waste Treatment.

ÇEV 443 Water Reuse 2+0 3,0
Introduction; Planning for Wastewater Reclamation and Reuse; Public Health and Environmental Issues in Water Reuse; Importance of Water Reuse for the Future; Types of Reuse Applications: Urban reuse, Industrial reuse, Landscape irrigation and agricultural reuse, Groundwater recharge; Water Reclamation Technologies; Reclaimed Water Distribution and Storage; Risk Assessment of Reclaimed Water; Case Studies.

ÇEV 444 Solid Waste Management Project 1+2 4,0
Principles of Municipal and Industrial Solid Waste Management Design: Waste amount, Composition and sources, Collection system, treatment/ disposal processes; National Legislation: Legal restrictions on selection and design of solid waste management system; Open Ended Design Problems: Software Application in Process Design; Collection Design; Material Recovery Facility Design; Recycling System Design; Composting Process Design; Incineration Plant Design; Landfill Design; Economic Analysis: Material and Energy Recovery; Investment; Operating costs; Industrial Solid Waste Management: Waste Minimization; Recovery.

ÇEV 445 Environmental Modeling 3+0 4,5
Mathematical Modeling in Environmental Sciences and Engineering; A General Overview of Model Development Process: Calibration and verification processes; Well-Mixed Systems: Steady and unsteady state conditions; Numerical Methods in the Modeling of Well-Mixed Systems; General Principles in Stream Modeling; Modeling of Streams: Wasteload Allocation; Streeter-Phelps Model: Aerobic and anaerobic conditions; Regression Models and Applications; Uncertainty Analysis: Perturbation. First order error analysis, Monte Carlo simulation; Widely Used Models: Watershed models (HSPF), Stream models (QUAL2EU), Ecological models, Climate models.

ÇEV 447 Wastewater Engineering 3+0 4,0
Quantities and Characteristics of Wastewater: Physical, inorganic, nonmetalic, organic and biological characteristics;

Screening, grit removal, sedimentation and flotation in wastewater treatment plants and their operational problems; Coagulation, flocculation and disinfection processes in wastewater treatment plants and their operational problems; Biological Wastewater Treatment: Suspended and fixed growth systems; Suspended growth process design and operational problems; Fixed growth process design and operational problems; Nutrient Removal: Nitrogen removal, Phosphorus removal, removal of nitrogen and phosphorus together; Anaerobic removal in wastewater treatment and its operational problems; Sludge treatment processes.

ÇEV 448 Coastal Zone Management 2+0 3,0
Characterization and Properties of Coastal Environments; Coastal Plains, Lagoons, Beaches; Ecological and Economic Importance of Coastal Areas; Coastal Features; Coastal Wave Climate: Cross shore and oblique waves, Near-shore currents; Coastal Erosion and its Effects; Precautions to Hinder Coastal Erosion; Pollutant Sources and Pollutant Types in the Coastal Environment ; Prevention of Coastal Pollution; Protection of Coastal Habitats.

ÇEV 449 Graduation Project in Environmental Engineering I 1+2 3,0
Preliminary Research on the Topic Chosen under the Guidance of an Advisor; A Broad Literature Survey about the Topic; Preliminary Studies for Setting-up Laboratory Experiments; Design of Experimental Set-ups; Acquisition of Data for Theoretical and/or Modeling Studies; Determination of the Steps of the Study; Reporting the Results.

ÇEV 450 Graduation Project in Environmental Engineering II 2+4 6,0
Theoretical and/or Experimental Works Related to the Chosen Topic under the Guidance of an Advisor; Reporting the Results; Presentation of the Results as a Poster; Oral Presentation before a committee.

ÇEV 453 Environmental Ethics and Environmental Engineering 3+0 4,5
Basic Topics: Why philosophy?, An introduction to environmental philosophy, History of environmental utopias, Utopia and Thomas More, The country of sun and ve Tommasso Campanella; Science, Ethics and Environment: The history of civilization and development, Natural wealthes and natural sources, Dialectics of nature, The development and transmission on science and technology, Science and ethics; The Theory of Ethics and Environment: The rights of nature, The theory of future generations, The approaches on anthropocenticism and ecocentrism, The current approaches on ecology, Deep ecology, The philosophy of social ecology, Environmeantal science or ecology, Political ecology; Environmental Ethics and Environmental Engineering:The moral value of profession , Ethics for engineers, Environmental engineering and the ethical approaches on solution of environmental problems, The ethic codes on environmental engineering applications, Case studies and environmental ethics.

ÇEV 455 Occupational Health and Safety 3+0 4,5
Local and International Legal Requirements; Business Law; Legal Rights and Responsibilities of the OSH Experts; Chemical Risk Factors; Biological Risk Factors; Risk Analysis Methods and Applications; Emergency Plans; OHSAS 18001 Occupational Health and Safety Standards; Corrective and Preventive Actions: Operating controls and audits to eliminate detected nonconformities and deployments; OSH Measures in Different Sectors: Industrial plants, Construction, Mining, Machine safety requirements; Explosion Protection Document Preparation: Flammable and explosive materials, Category selection; Occupational Hygiene: Job identification and hygiene applications; Ergonomics: LMM, REBA, WHO methods; Safety Trainings: Approaches, Plans and Applications.

ÇEV 457 Computer Aided Mapping at Engineering Science 3+0 4,5
Basic Map Knowledge: Map and Map types, Scale at map and scale types, Coordinates systems, Concepts related to the projection systems; Cartographic Map Design; Computer Aided Mapping: The hardware and software used at computer aided mapping; CAD systems and Mapping; Software Introduction; Basic Map Drawing Commands; CAD Based Data Generation; Data Editing; Planning Applications with CAD Systems: Drinking water project planning, Waste water and storm water project drawing, design, analysis and modeling.

ÇEV 459 Principles of Biological Treatment 3+0 4,0
Microbial Groups; Microbial Metabolism and Growth: Enzymes and enzyme kinetics, Metabolism, Growth kinetics; Role of Microorganisms in Biogeochemical Cycles: Microbiology of nitrification and denitrification and their kinetics, Microbiology of the phosphorus cycle, Enhanced biological phosphorus removal, Microbiology of the sulfur cycle; Pathogens and Parasites in Wastewater; Water and Wastewater Treatment Microbiology: Biology of activated sludge, Bulking and foaming in activated sludge plants, Attached microbial growth, Waste stabilization ponds, Sludge microbiology, Anaerobic digestion of wastewater and sludge.

ÇEV 461 Green Engineering Design and Sustainability 3+0 4,5
"Green" Engineering Approach to Product and Process Design: Minimization of environmental and health impacts, Design techniques that minimize pollution and cost; Pollution Prevention: Macroscale (life-cycle analysis-assessments, design, cost analysis), Mesoscale (unit operations design and flowsheet analysis), and Microscale (molecular level); Case Studies.

ÇEV 462 Computer Aided Engineering Design 3+0 4,5
Two Dimensional Drawing for Engineers; Descriptions of the GUI (Graphical User Interface) and Hardware of the Software (AutoCAD), the Interaction with Other Softwares; The Logic of the AutoCAD; Pull Down Menu Commands for Two Dimensional Drawing (2D): File (New, Open, Save etc.), Format (Layer, Text Style, Dimension Style, Point

Style etc.), Tools (Attributes, Drafting Settings etc.), View (Zoom, Pan, Toolbars etc.) and Draw (Line , Arc, Hatch, Block etc.), Modify (Erase, Move, Ofset, Array, Divide, Trim, Chamfer etc.) and Insert (Block, Raster Image), Dimension (Linear, Align, Radius, Leader etc.) Pull Down Menus; Object Snap (OSNAP), Object Selection Methods.

ÇEV 462 Computer Aided Engineering Design 3+0 4,5
Two Dimensional Drawing for Engineers; Descriptions of the GUI (Graphical User Interface) and Hardware of the Software (AutoCAD), the Interaction with Other Softwares; The Logic of the AutoCAD; Pull Down Menu Commands for Two Dimensional Drawing (2D): File (New, Open, Save etc.), Format (Layer, Text Style, Dimension Style, Point Style etc.), Tools (Attributes, Drafting Settings etc.), View (Zoom, Pan, Toolbars etc.) and Draw (Line , Arc, Hatch, Block etc.), Modify (Erase, Move, Ofset, Array, Divide, Trim, Chamfer etc.) and Insert (Block, Raster Image), Dimension (Linear, Align, Radius, Leader etc.) Pull Down Menus; Object Snap (OSNAP), Object Selection Methods.

ÇEV 463 Quality Management Systems in Environmental Engineering 3+0 4,5
Definitions and Goals of an Environmental Management System: Structure of ISO 14001 Environmental Management System, Environmental policy, Environmental procedures; Definitions and Goals of Occupational Health and Safety Management System: Structure of OHSAS 18001 Management System, OHSM policy and procedures, Risk assessment, Emergency plans, Monitoring and measurement; General Definitions in the Laboratory Accreditation Process; Fundamentals of TS EN ISO/IEC 17025; Coverage of TS EN ISO/IEC 17025: Reference standards and/or documents, Terms and definitions, Management essentials, Technical essentials; Accreditation Practices: Preparation of documents.

ÇEV 464 Industrial Hygiene and Work Safety 2+0 3,0
Epidemiological Studies, Safety Engineering and Risk Management Principles; Safety Engineering; Public Health and Occupational Diseases; Ergonomics and Work Psychology; Regulatory Measures; Industrial Accidents and Engineering System Failures: Emergency action plans; Transportation, Storage and Handling of Hazardous Materials; Dose-Response Relationships; Chronic and Acute Exposures; Cost-Risk-Benefit Analysis; Work and Environmental Health Relationships.

ÇEV 465 Sludge Treatment and Disposal 3+0 4,5
Principals of Sludge Management: Definitions and sludge sources, National and International Legislation, Physical, Chemical and biological properties of sludge; Main contaminants in sludge; Sludge Treatment and Disposal Methods: Sludge stabilization, Sludge thickening, Dewatering, Conditioning, Pathogen removal from sludge; Final Disposal Methods: Thermal methods, Landfilling, Land disposal.

ÇEV 466 Ecological Planning and Ecotechnology 2+0 3,0
Deformations of Balance in Ecosystems; Problem of Energy; Impacts of Increasing Population, Urbanization and Industrialization on Nature; Protection of Biodiversity and Natural Areas; Agricultural Problems; Nutritional Problems; Impacts of Polluting Sources to Biotic and Abiotic Environment; Environmental Planning; Environmental Health; Assessment of Alternative Environmental Projects; Investigations of Scientific and Ethic Problems for a Good Environment in the Future.

ÇEV 467 Environmental Exposure Assessment 3+0 4,5
Introduction to Exposure Assessment: Exposure, Exposure dimensions, Exposure routes, Exposure pathways; Exposure Assessment Methods: Direct methods, Indirect methods; Questionnaires in Exposure Assessment; Personal Exposure Measurements; Biological Monitoring; Exposure Modeling: Environmental modeling, Probabilistic exposure modeling, Geographic information systems applications; Case Studies in Exposure Assessment.

ÇEV 468 Watershed Management 2+0 3,0
Introduction: Concepts of watershed management, Current issues in water management, Characteristics of effective watershed management; Watershed Inventory: Physical features and landforms, Climate, Soil characteristics, Streamflow, Groundwater, Water quality, Land use; Developing Management Options: Identifying the sources, Types of options, Constraints and criteria; Simple Assessment Methods; Detailed Assessment Methods.

ÇEV 469 Water and Waswater Treatment Using Membrane Systems and Processing 3+0 4,5
Introduction to Membrane Systems; Structures and Characteristics of Membranes; Membrane Modules and Types; Membrane Module Configurations; Mass Transfer with Membrane Processes; Module Design and Characteristics; Concentration Polarization and Pollution Models; Microfiltration; Ultrafiltration; Nanofiltration; Reverse Osmosis and Advanced Osmosis; Pervaporation; Electro-dialysis; Industrial applications.

ÇEV 472 Environmental Politics 3+0 4,5
Environment; Concept of Environment; Environmental Problems and the Relationship Between Environment and Human Beings; Concept of Politics and Environmental Politics; Intellectual Trends that Affect the Improvement of Environmental Politics; Political Environmental Science: Liberal-Capitalist Politics, Marxist Environmental Politics, Ecosocialism; Environmental Concept in International Area and Improvements: Globalization and Environment; Environmental Rights; Environmentalism; Environmental Actions; Environmental Management and Politics; Environmental Management and Organization in Turkey; Environmental Politics in Turkey; Urbanization and Environment; Industrialization and Environment.

ÇEV 474 Environmental Reactions and Reactor Kinetics 3+0 4,5

Mole Balance and Rate Expressions for Homogeneous and Heterogeneous Chemical Reactions; Effects of Physical Conditions: Temperature, Pressure, Chemical composition on reaction rates; Conversion and Reactor Sizing, Isothermal Reactor Design ; Mass Transport and Process Models; External Diffusion Effects on Heteregoneous Reactions; Kinetics of Biochemical Reactions and Microbial Processes.

ÇEV 475 Environmental Legislation I 2+0 3,0

Constitution of the Turkish Republic; Laws, Environmental Law and Its Aim; Whole Legal Texts on Environment in Turkey; Regulations, Directives, Circulars; Regulation on Water Pollution and Control; Directive on Sampling and Methods of Analysis; Directive on Administrative Methods; Directive on Technical Methods; Regulation Concerning the Quality of Surface Waters Intended for Use as a Drinking Water Supply; Directive on Urban Wastewater Treatment; Directive on Recreational Waters.

ÇEV 476 Environmental Legislation II 2+0 3,0

National and European Union Legislation on Wastes; Regulation on Waste Framework; Regulation on the Control of Solid Wastes; Regulation on the Control of Hazardous Wastes; Regulation on the Control of Healthcare Wastes; Regulation on the Control of Hazardous Chemical Substance and Products; Regulation on Packaging and Packaging Wastes; Regulation on Special Wastes: PCB and PCT, Waste oils, Vegetable waste oils, Waste battery and accumulators, End of life tires; Regulation on the Control of Construction and Demolition Wastes; Regulation on Alternative Fuels Derived from Wastes.

ÇEV 478 Atmospheric Chemistry 3+0 4,5

Introduction: Description of the atmosphere, Composition of air, Importance of atmospheric reactions; Greenhouse Effect: Greenhouse gases, Sources of Greenhouse gases, Radiation balance on the earth; Stratospheric Ozone: Discovery, Formation, Chapman reactions; Tropospheric Ozone: Formation, Reactions; Photochemical Smog; Acid Rain: Formation and fates of inorganic and organic acids in the troposphere; Atmospheric Aerosols: Definition of aerosol, Importance of aerosols, Chemistry of aerosols; Atmospheric Semivolatile Organic Compounds.

ÇEV 480 Air Pollution Meteorology and Atmospheric Dispersion 3+0 4,0

Basic Information about Meteorology; Vertical Stratification in the Atmosphere; Tropospheric Meteorology and Air Pollution; Atmospheric Stability Classification; Micrometeorology: Mixing height, Relationship between wind and height, Boundary layer, Meteorological measurements; Atmospheric Diffusion Theories; Calculations Related to Atmospheric Diffusion: Gaussian dispersion equation, Other analytical solutions, Plume rise; Atmospheric Particles and Aerosols: Size distributions, Aerosols and visibility, Aerosols and climate; Deposition; Atmospheric Chemical Transport Models; Frequently Used Models: Meteorological models, Chemical models, Combined models; Statistical Models.

ÇEV 482 Air Pollution Laboratory 1+2 3,0

Sampling, Analysis and Evaluation Techniques in Air Pollution Monitoring; Sampling Techniques in Ambient Air; SO2-PM Measurement; NO2 Measurement; Automatic Measurement Systems (CO, NOx, O3): Operation principles, Calibration, Operation of the air quality monitoring station; Sampling of Atmospheric Constituents with Denuder and Their Secondary Analysis; Sampling and Analysis of Particles at Different Sizes; Measurement of Meteorological Parameters; Sampling and Analysis of Organic Compounds; Isokinetic Sampling of Flue Gas; Orsat Analysis; Indoor Sampling with Personal Samplers and Analysis of the Constituents; Evaluation of the Data and Report Writing.

ÇEV 484 Small-scale Wastewater Treatment Systems 2+0 3,0

Introduction to Decentralized Wastewater Management Systems and Their Management; Constituents in Wastewater; Introduction to Process Analysis and Design; Wastewater Pretreatment Operations and Processes; Alternative Wastewater Collection Systems; Biological Treatment and Nutrient Removal; Lagoon Treatment Systems; Wetlands and Aquatic Treatment Systems; Land Treatment Systems; Packed-Bed Filters; Effluent Disposal for Decentralized Systems; Biosolids and Septage Management.

ÇEV 486 Industrial Wastewater Treatment 3+0 4,0

Fundamentals of Industrial Wastewater Treatment; Basic Industries and Their Wastewater; Textile Industry Wastewater and Their Treatment; Radioactive Liquid Waste Treatment; Agricultural Industries and Their Wastewater; Purification of Salty Water, Removal of Oily Wastewater, Removal of Blood and Protein, Refinery Wastes and Their Treatment, Metal Plating Wastes; Chemical Plant Wastes; Food Industry Wastes; Treatment of Pharmaceutical Wastes: Waste Recovery and Control; Operational Problems.

ÇEV 488 Landfill Design 3+0 4,0

Introduction; National and International Regulations; Projection of Population and Prediction of Solid Waste Amounts; Determination of Landfill Capacity; Site Selection: Techniques used for site selection, Geographic information systems, Multi-criteria decision making techniques; Design of Liner and Cover Systems; Prediction of Leachate and Landfill Gas Production; Management of Leachate and Landfill Gas; Planning of Landfill Closure; Economic Analysis of Landfill.

ÇEV 489 Advanced Treatment of Water and Wastewater I 3+0 4,0

Advanced Oxidation; Fenton Oxidation; Ultraviolet Oxidation; Photo-catalytic Oxidation; Oxidation with Ozone; Electrochemical Treatment: Fundamental definitions and laws in electrochemistry, Electrocoagulation, Electroflotation; Membrane Processes: Introduction to membranes, Membranes, Fundamentals of the process,

Ultrafiltration; Nanofiltration; Reverse Osmosis; Electrodialysis.

ÇEV 490 Advanced Treatment of Water and Wastewater II 3+0 4,0
Ultrasound: Cavitation, Origin of sonochemical effect, Parameters that affect cavitation, Ultrasonic power measurement, Environmental application of ultrasound; Adsorption for Wastewater Treatment; Factors Affecting Adsorption; Adsorption Equilibria; Adsorbents: Production and properties of activated carbon; Fixed-Bed Adsorbers; Equilibrium in Ion-Exchange; Ion-Exchange Materials; Ion-Exchanger Design.

ÇEV 492 Air Quality Management Project 1+2 4,0
Urban and industrial air quality management: Preparation of emission inventories; Preparation of clean air plans and solutions of open-ended problems related to energy saving and pollution reduction strategies at industrial plants; Choice of the best against alternatives regarding criteria like cost, applicability, etc.

EEM 102 Introduction to Electrical Engineering 4+2 7,5
Electrical Engineering Profession; Electrical Charge, Current, Potential, Energy and Power; Resistance and Ohm's Law; DC Voltage, Current and Power Measurements: DC voltmeter, Ammeter, Ohmmeter and Wattmeter; Oscilloscopes; Linear Circuit Elements; Kirchoff's Laws; Loop and Node Analysis; Superposition; Thevenin and Norton Equivalent Circuits; Alternating Current Circuits; Sinusoidal Input Function; Phasor Concept; Steady-state Response to Sinusoidal Input; Average Power; Complex Power; Mutual Inductance and Transformers; AC Measurements; AC Power Calculations and Measurements; Polyphase Circuits; Semi-conductors: Diodes and transistors, Basic electronic circuits; Fields of Electrical Engineering.

EEM 104 Professional Aspects of Electrical & Electronics Engineering 2+0 3,0
Elektrik-Elektronik Mühendisliği Bölüm Tanıtımı, Mühendislik mesleği, Mühendislik etiğinin toplumsal önemi, Mühendislik uygulamalarının evrensel ve toplumsal boyutlarda etkileri, Teknolojik gelişmeler, Yaşam boyu öğrenmenin gerekliliği, Girişimcilik.

EEM 206 Electrical Circuits Laboratory 1+2 3,0
Short Circuit, Open Circuit, Serial and Parallel Connections; Power Calculation; Voltmeter Loading; Thevenin's Theorem; Computer Aided Circuit Analysis; RL and RC Circuits; Resonance Circuits; Unit Step and Pulse Response of Linear Circuits; OPAMP Circuits; Active Filters; Unit Step and Pulse Response of Non-Linear Circuits; Frequency Response of RL, RC, RLC and OPAMP Circuits.

EEM 208 Electromagnetic Fields and Waves 4+0 7,0
Vector Analysis; Electrostatic and Magnetostatic Fields; Ampere's Law; Magnetic Circuits; Vector Magnetic Potential; Quasi-static Electromagnetic Fields; Dielectric and Magnetic Materials; Faraday's Law; Electromagnetic Energy and Forces; Electromotive Force and Potential; Boundary-Value Problems; Maxwell Equations; Wave Propagation; Plane Waves; Reflection; Refraction; Polarization; Radiation.

EEM 209 Circuit Analysis 4+1 7,5
Transient Response: RL and RC circuits, Natural and forced response, Unit step response; RLC circuits; Complex Frequency; Frequency Response; Filters: Low-pass filters, Band-pass filters, High-pass filters, Quality factor; Bode Plots: Drawing Amplitude and Phase Graphs; Operational Amplifiers; Two-Port Circuits; Fourier Series; Fourier Transform and its Applications in Circuit Analysis; Application of Laplace Transform in Circuit Analysis.

EEM 210 Fundamentals of Semiconductor Device 3+0 5,0
Wave-Particle Duality: Blackbody radiation, Photoelectric Effect, X-Ray diffraction, Compton Effect, de Broglie Waves; Uncertainty Principle, Bohr Model of the Atom, Energy Levels and Spectra, Atomic Excitation, The Laser; Introduction to Quantum Mechanics: Schrödinger Equation, Particle in a Box, Finite Potential Well, Tunneling Effect, Harmonic Oscillator; Semiconductor Materials: Crystal Structure, Energy Bands, Density of States; Conduction mechanism: Carrier Concentration, Donors and Acceptors, Mobility, Resistivity; Hall Effect, Carrier Diffusion, Generation and Recombination Processes; P-N Junction, Current-Voltage Characteristics; Bipolar Devices: The Transistor Action, Modes of Operation, Frequency Response; Unipolar Devices: Metal-Semiconductor Contacts, JFET, MESFET, MOS Diode, MOSFET; Modern Fabrication and Experimental Techniques.

EEM 214 Electrical Engineering for Mechanical Engineers 3+0 3,5
Principles and Components of Electrical Circuits; Variables of Circuit Elements and Measuring Devices; Kirchoff's Laws; Circuit Analysis Techniques; Nodal Analysis; Electronic Analog and Digital Systems; Three-phased Circuits; Digital and Analog Building Blocks; Elements of Power Electronics and Circuits; Electric Machines; Transformators, Synchronous and asynchronous machines, Direct current machines.

EEM 232 Digital Systems I 4+0 7,0
Number Systems; Logic Gates; Designing Binary Systems using Gates; Boolean Algebra; Karnaugh Maps; Combinational Circuit Analysis and Design; Hardware Description Language (HDL); Basic MSI (Middle scale integrated) Devices: Decoder, Encoder, Multiplexer, Demultiplexer, Binary adder (Half adder, full adder); Binary Arithmetic; Sequential Logic Concept and Design: Latch and flip-flop, State diagrams and state tables, Sequential circuits with D flip-flops, J-K flip-flops and R-S flip-flops; Registers and Counters; Memory and Programmable Logic Devices: Static/dynamic RAM modules.

EEM 238 Digital Systems Laboratory 0+2 2,0
Introduction to Logic Gates (Basic Boolean algebra with gates); Timing Consideration of a Gate; Voltage Transfer Characteristics; Fan-out, Fan-in Concepts; Implementation of a Problem with Sum of Products and Product of Sums; Combinational Circuit Design with MSI Devices; 4-bit Adder/Subtracter Circuitry Design; Synchronous Sequential Logic Design Experiment (Counter design); Data Bus and Register Transfer Experiment; Memory Experiment.

EEM 301 Signals and Systems 4+0 7,0
Discrete and Continuous Time Signals; Causality; Static / Dynamic, Discrete / Continuous Time, Linear / Non-linear, Time Varying / Invariant Systems; Laplace, Z, Fourier and Discrete Fourier Transforms; Modeling and Responses of Linear and Time Invariant Discrete and Continuous Time Systems; Differential Equations and Difference Equations; State Variables and State Equations; Impulse Response; Convolution; Transfer Functions; Realization of Transfer Functions; Computer Simulations; Fourier Analysis of Discrete and Continuous Time Systems; Sampling and Reconstructing.

EEM 305 Signals and Systems 3+0 4,5
Discrete and Continuous Time Signals; Causality; Static / Dynamic, Discrete / Continuous Time, Linear / Non-linear, Time Varying / Invariant Systems; Laplace, Z, Fourier and Discrete Fourier Transforms; Modeling and Responses of Linear and Time Invariant Discrete and Continuous Time Systems; Differential Equations and Difference Equations; State Variables and State Equations; Impulse Response; Convolution; Transfer Functions; Realization of Transfer Functions; Computer Simulations; Fourier Analysis of Discrete and Continuous Time Systems; Sampling and Reconstructing.

EEM 308 Introduction to Communication 3+2 6,5
Fourier Series, Fourier transforms; Power, Energy, Autocorrelation function, Power spectral density; Sampling; Hilbert Transforms, Lowpass representations of bandpass signals and systems; DSB-SC, DSB, SSB, VSB Amplitude Modulation, Amplitude modulators and demodulators; PLL; Angle Modulation: Freqency modulation (FM) and phase modulation (PM); Spectral Characteristics of Angle-Modulated Signals, Effective bandwidth, Carson's rule; Angle Modulators and Demodulators, Random processes: WSS processes, Gaussian and white processes, Noise equivalent bandwidth, Bandpass processes; Effect of Noise on Analog Communication Systems; Pre-Emphasis and De-Emphasis Filtering.

EEM 311 Principles of Energy Conversion 3+2 7,0
Electromagnetic Circuits; Properties of Ferromagnetic Materials; Single-phase Transformers; Three-phase Transformers; Per Unit System; Principles of Electromagnetic Energy Conversion; Analysis of Singly or Multiply Excited Linear Systems; Analysis of Singly or Multiply Excited Rotational Systems; DC Machines: Generators, Motors, and Speed control.

EEM 321 Electronics I 3+0 5,0
Diodes; Diode Applications; Zener Diodes; BJT Transistors; Common Emitter, Common Collector, Common Base Connections; Field Effect Transistors (FET); DC Analysis of Transistors; Thermal Effect and Stability Analysis; BJT Equivalent Circuits; FET Equivalent Circuits; Small Signal Analysis; Low Frequency Amplifiers; Frequency Response of Amplifiers; Input-Output Impedances.

EEM 322 Electronics II 3+0 5,0
Feedback Amplifiers: Series voltage, Series current and Parallel current feedback circuits; Frequency Response of Feedback Amplifiers; Operational Amplifiers (OPAMP); OPAMP Applications; Active Filters; Differential Amplifiers; Transistor Models at High Frequencies; High Frequency Response of Amplifiers; Multistage Amplifiers; Power Amplifiers (classes A, B and C); Oscillators.

EEM 328 Electronics Laboratory 1+2 3,0
Diode Characteristics; Examination of Various Diode Circuits; BJT Characteristics; Examination of Various BJT Circuits; FET characteristics; Examination of various FET circuits; Common Emitter / Source, Common Collector/Drain, Common Base/Gate Amplifiers; Frequency Response of Amplifiers; Differential Amplifiers; OPAMP Circuits; Design and Applications of Amplifiers with OPAMP.

EEM 334 Digital Systems II 3+0 5,0
Asynchronous Sequential Logic; Register Transfer Language and its Related Hardware Design; Design of a Basic Computer Datapath and its Connection to Register Bank; Sequencing of Register Transfer Operations; ASM (Algorithmic State Machine) Approach and Design Fundamentals; Designing Single Clock Cycle and Multiple Clock Cycle Computer; Instruction Set Architecture Concept: Addressing modes, Architectures, Instruction Types; Comparing Two Different CPU Designs: CISC and RISC; CISC and RISC Design Fundamentals.

EEM 336 Microprocessors I 3+2 7,0
8 Bit Microcontrollers; Command Subsets and Machine Language; Index Modes; Program Structure and Design; Advanced Programming in Assembler Language (Indexing; Arithmetic Operations; Bit and Byte Manipulation; Stacks; Subroutines; Loops); Fundamentals of the Design of Systems with Microprocessors; Memory Decoding; Data/Address/Control Buses; Input / Output Hardware; Interrupt Logic; Parallel Input / Output Interfaces; A/D and D/A Operations; Serial Communication Interfaces; Interrupt Hardware; Real Time Clock; Program Timer; Error Recovery Operations with COP Timers.

EEM 342 Fundamentals of Control Systems 3+2 7,0
Analysis of Discrete- and Continuous-time Control Systems Using Transfer Functions and State Variables; Stability; Transient Response; System Types and Steady State Errors; P, PI, PD, and PID Controls; Root Locus; Discrete- and Continuous-time Controller Design Using Root Locus; Hybrid Systems and Computer Controlled Analogue

Systems; Discrete-time Controller Design for Continuous-time Systems.

EEM 403 Fundamentals of Optoelectronics and Nanophotonics 3+0 5,0

Wave Optics: Maxwell?s wave equation, Fresnel?s equations, Light waves in a homogeneous medium, Total internal reflection, Interference and optical resonators; Dielectric Waveguides and Optical Fibers: Planar slab and rectangular waveguides, Dispersion in waveguides, Optical fibers; Semiconductor Devices: Direct and indirect bandgap semiconductors, Pn junction, Light emitting diodes and lasers, Photovoltaic devices, Photodetectors; Photonic Crystals: One- and two- dimensional periodic nanostructures, Principles of nanoplasmonics.

EEM 407 Digital VLSI Design 2+2 5,0

Introduction: MOS transistor theory, Circuit design, Simple CMOS gates; CMOS Processing Technology: Manufacturing steps, Design rules; Standard CMOS Circuits: Standard circuit synthesis, Circuit design using Euler method; VLSI CAD Tools: Introduction to VLSI CAD tools, Circuit drawing and analysis using Magic, Circuit simulation; Circuit Characterization: Analytical delay estimation methods, Transistor sizing, Logical effort method; Complex Circuit Design: Combinatorial circuit design, Sequential circuit design, Circuit timing, Interconnections, I/O structures; System Design: Design strategies, Standard cell designs, Library- based circuit synthesis.

EEM 409 Random Signals 3+0 5,0

Correlation of Signals; Energy and Power Spectral Densities; Hilbert Transform; Principles of Modulation; Stochastic Processes: Characterization, Correlation functions, Stationarity, Ergodicity, Auto-correlation sequence, Power spectral density; Transmission of Random Signals Through Linear Systems; Special Stochastic Processes; Gaussian Processes; White Gaussian Noise; Band-limited Random Processes and Their Properties; Examples in Communications and Other Fields.

EEM 413 Electrical and Electronics Engineering Design Project I 1+5 3,0

Engineering Design Methodology; Problem Statement Involving Feedback Control Systems, Digital Signal Processing, Software and Systems, Digital System Design, VLSI Design, Robotics and Computer Vision, Electronic Circuits, Microelectronic Processing, Optoelectronics, Microwave Circuits and Power Systems; The Specification of the Requirements; Concept Generation and Evaluation; The Functional Design and Test; Grouping and Team Work; Effective Communication in a Teamwork Environment; Capstone Project Proposal Presentation and Proposal Writing.

EEM 414 Electrical and Electronics Engineering Design Project II 1+5 6,0

Embodiment of the Design Process Involving Feedback Control Systems, Digital Signal Processing, Software and Systems, Digital System Design, VLSI Design, Robotics and Computer Vision, Electronic Circuits, Microelectronic Processing, Optoelectronics, Microwave Circuits, Power Systems; Incorporation of Realistic Engineering Constraints; Cost Estimation and Manufacturability; Completion of a Team Project; Final Report Writing; Presentation.

EEM 444 Object Oriented Design 3+0 5,0

Introduction: Preprocessing commands, Basic structures; Object Oriented Model: Objects and classes, Fields and methods, Enumerations; Memory Control: Constructors and destructors, New and delete operators; Object Oriented Concepts: Information hiding, Encapsulation, Inheritance, Polymorphism, Operator overloading, Exception handling, try - catch blocks; OO Paradigms: Templates, Iterators, Vectors; Method Types: Virtual functions, Inline functions, Function overriding, Function pointers; Advanced Topics: Multithreading, Controlling critical sections, Semaphores, Atomic operations.

EEM 445 Design Process for Electrical and Electronics Engineers 2+0 3,0

Project Selection and Needs Identification: Engineering design projects, Sources of project ideas, Needs identification; Requirements Specification: Engineering requirements, Advanced requirements analysis; Functional Distribution: Guidance, Coupling and cohesion; Behavior Models: State diagrams, Flowcharts, Entity relationship diagrams, The unified modeling language; Teams and Teamwork: Models of team development, Characteristics of real teams; Project Management: Gantt charts, Cost estimation; Oral Presentations.

EEM 446 Cryptographic Hardware Design 3+0 5,0

Introduction to Cryptography: Symmetric-key cryptography, Public-key cryptography, Cryptographic hash functions; Computer-Aided Cryptographic Engineering; Digital System Design: Combinational and sequential logic design, Hardware description languages (HDLs), Reconfigurable logic devices, Design of computer systems and components; Metrics for Security in Embedded Systems; Cryptographic Hardware Architectures: Basic building blocks for cryptographic hardware, Hardware design for block ciphers, stream ciphers, and asymmetric cryptography, Design examples, High-performance and efficient design of cryptographic primitives.

EEM 447 Research in Digital Systems I 1+4 5,0

Network protocols; Optimization of network protocols; Developing network applications; System-on-chip fundamentals; System-on-chip hardware design; System-on-chip software design; Embedded system hardware design; Embedded system software design; Application development on real time operating systems; Mobile software applications; Low power RF system design; Hardware applications on FPGA.Network protocols; Optimization of network protocols; Developing network applications; System-on-chip fundamentals; System-on-chip hardware design; System-on-chip software design; Embedded system hardware design; Application

development on real time operating systems; Mobile software applications; Low power RF system design.

EEM 448 Research in Digital Systems II 1+4 5,0
Network protocols; Optimization of network protocols; Developing network applications; System-on-chip fundamentals; System-on-chip hardware design; System-on-chip software design; Embedded system hardware design; Embedded system software design; Application development on real time operating systems; Mobile software applications; Low power RF system design; Hardware applications on FPGA.

EEM 449 Embedded System Design 2+2 5,0
Embedded systems, development cycle of embedded systems, design requirements of embedded systems; ARM architecture and programming; interface design, ADC/DAC; timers, interrupts; ARM microcontroller system design, oscillators, reset circuits, DC-DC conversion; PCB design, line driver design, memory interfacing; communication, inter chip communication, network programming, TCP/IP communication, Ethernet; RF communication, RF interface circuits; real-time operating systems, real-time programming, multithreaded programming, process synchronization; graphical user interface, Qt programming.

EEM 450 Introduction to System Identification 3+0 5,0
System identification; Stochatic vs. non-stochastic formulation; Evaluation of algorithms; Random variables and stochastic processes; Signals and systems and related topics; Model parameterization and prediction; impulse and step responses; Correlation methods and spectral analysis; Least-squares estimation; Determining model dimension; Commonly used signals; Spectral properties; Persistent excitation; Consistency; Biase; Minimizing prediction errors; Convergence and consistency; The instrumental-variable methods; Kalman filter interpretation; Aliasing due to sampling; Closed-loop data; Model-order estimation.

EEM 451 Industrial Control Systems 1+4 5,0
Control applications in Industry: Fundamental controller types, Process control; Automation systems; Relays; Programmable Logic Controllers (PLC); Working principles of PLCs; Programming PLCs: logic operations, timer operations, counter operations, comparator operations, math operations, Implementing Control Laws in PLC: P, PI, PID controllers; Common elements in Process Control: Sensors, Transducers, Data acquisition systems, Signal conditioning circuits; Fundamental sensors and actuators in Robotic Systems.

EEM 452 Introduction to Robotics 3+0 5,0
Fundemental components of robotic systems; Spatial Decriptions and Transformations; Kinematics: Direct and inverse kinematics; Manipulator Dynamics: Lagrangian formulation, Newton-Euler Formulation; Trajectory generation: Trajectory generation in joint space versus operational space, Dynamic scaling of trajectories; Motion control: Control Feedback and Closed loop control; Interaction control: Position and force control; Sensors and actuators.

EEM 453 Research in Control and System Theory I 1+4 5,0
System Definition and Properties; Stochastic and Deterministic Systems; Linear and Nonlinear Systems; Continuous and Discrete Time Systems; Chaotic Systems; Finite and Infinite Dimensional Systems; System Modelling; Uncertain Systems, System Identification Methods; Stability Analysis of Linear and Nonlinear Systems; Performance Specifications of Controllers; Theoretical and Application Based Control Problems.

EEM 454 Research in Control and System Theory II 1+4 5,0
Feedback systems; Controller design approaches for finite dimensional systems; Robust controllers; Stable controllers; Proportional-integral-derivative controllers; Controller design approaches for infinite-dimensional systems; Petri nets; Synchronization problems; Consensus problems; Real time control applications.

EEM 455 Research in Power Systems I 1+4 5,0
Principles of Energy Conversion; Power Systems; Energy Transmission Lines; Three and Single Phase Circuits; Power Calculations and Control; Compensation Techniques; Power Electronics; Motor Driver Circuits and Speed Control; Electrical Machinery; Machine and Motor Characteristics; High Voltage; Electrostatic Fields and Field Strength Control; Overvoltage; Test Methods and Coordination of Isolation; Electrical Installation Systems; Parameter Calculation; Power Quality Subjects.

EEM 456 Research in Power Systems II 1+4 5,0
Power Electronics; Motor Driver Circuits and Speed Control; Electrical machinery; Machine and Motor Characteristics; High Voltage; Electrostatic Fields and Field Strength Control; Overvoltage; Test Methods and Coordination of Isolation; Principles of Energy Conversion; Power Systems; Energy Transmission Lines; Three and Single Phase Circuits; Power Calculation and Control; Compensation Techniques; Electrical Installation Systems; Parameter Calculation; Power Quality Subjects; Software and/or Hardware Applications.

EEM 457 Research in Signal Processing I 1+4 5,0
Introduction to Advanced Signal Processing Techniques; Introduction to Signal Detection and Parameter Estimation Methods: Classical Approach; Bayesian Approach; Modern Signal Modelling Techniques; Spectrum Estimation: Nonparametric Methods, Parametric Methods; Spread Spectrum Communications; Introduction to Array Signal Processing; Direction of Arrival Estimation Techniques and Systems; Signal Localization; Introduction to Radar Signal Processing.

EEM 458 Research in Signal Processing II 1+4 5,0
An elective course offered by the related faculty for individual research and development progress of the student:

Problem Definition; Signal Modelling; Defining the Problem Solution with Signal Processing Techniques; Simulation Studies; Performance Comparison; Interpretation of the Results; Design and Implementation; Verification of the Results; Fine Tuninig; Testing the Designed System; Reporting Final Results.

EEM 459 Research in Electronics I 1+4 5,0
Solid State Semiconductor Material Properties: Optoelectronic; Thermoelectrical; Optical and Similar Characteristics; Solid State Semiconductor Material Applications; Thin Film Growth Methods; Thin Film Characterization Methods; Micro and Nanofabrication Techniques of Devices; Theoretical and Applied Optoelectronics; Characterization and Measurement Techniques of Optoelectronic Devices; Optoelectronic Device (Lasers, Solar Cells, etc.) Operation Principles.

EEM 460 Research in Electronics II 1+4 5,0
Solid State Semiconductor Material Properties: Optoelectronic; Thermoelectrical; Optical and Similar Characteristics; Thin Film Growth Methods; Thin Film Characterization Methods; Micro and Nanofabrication Techniques of Devices; Theoretical and Applied Optoelectronics; Characterization and Measurement Techniques of Optoelectronic Devices; Optoelectronic Device (Lasers, Solar Cells, etc.) Operation Principles.

EEM 461 Research in Telecommunications I 1+4 5,0
Applications of Analog and Digital Modulation Techniques; Implementation of Amplitude Modulation; Angle modulation; Pulse Amplitude Modulation; Phase Shift Keying; Quadrature Amplitude Modulation; Frequency Shift Keying and Realization of Other Modulation Variants; Source Coding Applications; Implementation of Huffman Codes and Lempel-Ziv Codes; Channel Coding Applications; Linear Block Codes; Implementation of Convolutional Codes; Mobile Communications Applications; Radar Systems; Satellite Communications.

EEM 462 Research in Telecommunications II 1+4 5,0
Applications of Analog and Digital Modulation Techniques; Implementation of Amplitude Modulation; Angle modulation; Pulse Amplitude Modulation; Phase Shift Keying; Quadrature Amplitude Modulation; Frequency Shift Keying and Realization of Other Modulation Variants; Source Coding Applications; Implementation of Huffman Codes and Lempel-Ziv Codes; Channel Coding Applications; Linear Block Codes; Implementation of Convolutional Codes; Mobile Communications Applications; Radar Systems; Satellite Communications.

EEM 463 Introduction to Image Processing 3+0 5,0
2D Signals and sytems; Digital images: Color, stereo and video images, Sampling and quantization of images; Binary images: Image binarization, Morphological operations; Image transforms; Linear and nonlinear filters; Spatial and frequency domain image enhancement; Image restoration; Image segmentation; Image coding and compression: Lossy and lossless compression; Image processing applications: Security and surveillance, Medical image processing.

EEM 465 Fundamentals of Data Communications 3+0 5,0
Probability and random variables; Measures of information: entropy, mutual information; The asymptotic equipartition property; Data Compression, Krafft inequality; Optimal Codes: Huffman codes; Universal compression, Lempel- Ziv coding; Algebraic concepts; Linear block codes; Cyclic codes; BCH and Reed-Solomon codes; Linear convolutional codes; Properties of convolutional codes; Applications.

EEM 466 High Voltage Techniques 3+0 5,0
Introduction; Electric Field; Insulators; Estimation and Control of Electric Stress; Surge Voltages; Conduction and Electrical Breakdown in Gases; Conduction and Electrical Breakdown in Liquids; Conduction and Electrical Breakdown in Solids; Applications of Insulating Materials; Generation of High Voltages and Currents; Measurement of High Voltages and Currents; Electrostatic Fields and Field Stress Control; Non-Destructive Insulation Test Techniques; Overvoltages, Testing Procedures and Insulation Coordination; Design and Testing of External Insulation.

EEM 467 Digital Communications 3+0 5,0
Signals, power of signals, FT, concepts of modulation, multiplexing (time, frequency and code), networks, allocation of frequency spectrum, noise analysis; Geometric representation of signals, BER analysis, MF detection; ISI, raised cosine spectrum, trellis diagrammes, channel equalization; Channel capacity and coding, block codes, cyclic codes and convolutional codes.

EEM 468 Advanced Communication Techniques 3+0 5,0
Optical Communications; Ray Theory; Mod Propagation; Attenuation and Dispersion in Fibres; Inter Symbol Interference (ISI) and Doppler Effect in Wireless Communication; Channel Equalization; Coding; Block Codes; Cyclic Codes and Convolutional Codes; Trellis Diagrammes; Spread Spectrum Techniques; Pseudo-Noise (PN) Sequences and Their Generations; Code Division Multiple Access (CDMA) Communication Protocol; Multipath Fading.

EEM 469 Communication Electronics 3+0 5,0
Analysis of Transmission Lines; Smith Chart; Impedance Matching of Distributed and Lumped Element Circuits; Distributed Resonator Circuits; Two Port Scattering Parameter Analysis; Filter Design by Insertion Loss Method; S-Parameters and RF Amplifiers; Oscillator Design; PLL and Frequency Synthesizers; Noise and Linearity Problems in Communication Systems; Receivers and Modulators; Detectors and Mixers.

EEM 470 Microwaves and Antennas 3+0 5,0
Electromagnetic Plane Waves; Antenna Parameters; Antenna Radiation Pattern; Antenna Gain; Antenna Efficiency and Impedance; Transmission Line Analysis;

Antenna Effective Aperture; Friis Transmission Equations; Antenna Radiation Fields; Radiation Integrals and Auxiliary Potential Functions; Wire and Dipol Antennas; Short and Half Wave Dipol Antennas; Monopole Antennas; Monopole Antennas Above an Infinite Ground Plane; Loop Antennas; Antenna Arrays; Waveguides TEM, TE, and TM Mods; Parallel Plate Waveguide; Analysis of Waveguides with a Rectangular or Circular Cross-Section.

EEM 471 Electrical Machinery I 2+2 5,0
DC Machines with Commutator; Structural Properties; Operational Concepts; Circuit Models of DC Machines; Series, Shunt and Compound Machines; Structural Properties; Rotating Field Theory; Circuit Models of Synchronous Machines; Generator and Motor Operation Cases; Asynchronous Machines; Structural Properties; Circuit Models of Asynchronous Machines; Performance Calculations; Speed Control Techniques and Motor Characteristics.

EEM 472 Electrical Machinery II 2+2 5,0
Operational Characteristics and Applications of Stepping Motors; Operation and Control of Linear Asynchronous Motors; Motors Used in Rail-way Traction Systems; Single-phase Machines; Capacitor-type Machines; Shaded Pole Machines; Permanent Magnet DC Machines and Speed Control; Starting Properties of Asynchronous Machines; Machines Used for Special Applications; Reluctance and Synchros; Linear Motors.

EEM 473 Power Systems Analysis I 3+0 5,0
Basic Theorems Used in Power Systems; Phasors; Complex Power; Symmetrical Components; Sequence Networks of Load and Rotating Machine Systems; Power Transformers; Transmission-Line Parameters; Differences of Transmission-Line Parameters due to Line Structure; Steady-State Analysis of Transmission-Lines, Equivalent pi Circuit, Maximum Power Flow, Reactive Compensation Techniques.

EEM 475 Power Electronics I 3+0 5,0
Uncontrolled Diode Rectifiers; Phase-Controlled Rectifier and Inverter Circuits; Single-Phase and Three-Phase Inverters; DC Switched Converter and Inverter Circuits; Buck, Boost and Full-Bridge DC Converters; DC-AC Switched İnverters; Resonance Converters; Basic Resonance and Load Resonance Converters; Direct Current Power Supplies; Computer Models of Power Electronics Circuits.

EEM 476 Power Electronics II 2+2 5,0
Direct and Alternative Current Motor Driver Systems; Equivalent Circuits; Permanent Magnet DC Servo-Drivers; Asynchronous Motor Drivers; Pulse Width Modulation with Variable Frequency and Square Wave Drivers; Industrial Applications of Power Electronics; Analysis of Current Harmonics; Harmonics Reduction Method; Direct Current Transmission-Lines; Snubber Circuits; SCR Circuits; Special Topics on Industrial Applications.

EEM 477 Digital Signal Processing 3+0 5,0
Discrete Time Systems and Signals; Periodically Sampling, Reconstruction; Changing Sampling Frequency; Z-Transform; Inverse Z-Transform; Linear Time-Invariant Systems; Frequency Response; Systems Described by Difference Equations; Discrete System Functions; Zeros and Poles; Minimum Phase Systems; Graphical Representations of Difference Equations; FIR and IIR Systems; Lattice Structure; Filter Design Methods; Fast Fourier Transform.

EEM 478 Digital Signal Processing Hardware 1+4 5,0
Digital Signal Processors (DSP); Fix Point Processors; Introduction to Texas Instruments TMS3205x Fix Point Processors; Memory Organization; ALU; Interrupts; Serial Ports; Direct Memory Access; C5x Programming; Fixed Point Code Optimisation; Introduction to Floating Point DSP Processors; T1 TMS320C3x Systems; ALU; Interrupts; Serial Ports; DMA; Sampling; Floating Point Programming and Optimisation.

EEM 479 Electrical Installation Systems 2+2 5,0
Rules and Standards of Electrical Installation Engineering; Safety of Electrical Installations; Motor, Heating and Illumination Load Connections; Calculations of Supplied Power and Maximum kVA Ratings; Illumination and Load Distribution Factors; Illumination Calculations; Protection Methods Against Short Circuit and Extremely High Voltages; Power Factor Compensation Methods; Schedules and Energy Measurement; Grounding Methods; Distribution Panels; Determination of Conductor Size; Calculation of Voltage Drop; Sample Installation Projects and Project Applications.

EEM 480 Algorithms and Complexity 3+0 5,0
Mathematical Preliminaries to Define Complexity: Orders of magnitude, Recurrence relations, Time complexity, Space complexity; Recursive Algorithms; Abstract Data Types; Object Orienting Programming Preliminaries; Stacks and Queues; Analyzing of Sorting and Searching Algorithms; Trees: Binary trees search trees, Analysis of Insertion into trees and deletion from trees; Priority queues; Analysis of Hash Tables.

EEM 481 Solid State Electronics 3+0 5,0
Semiconductors; Physical Properties of Semiconductors; Atomic Structure of Semiconductors; Energy Bands; Carrier Concentrations; PN-junction Elements; One Pole Elements; Double Pole Elements; Diodes; Bi-junction Transistors (BJT); Field Effect Transistors (FET); Fundamentals of Integrated Circuits; Integrated Circuits Design; Fundamentals of Production of Integrated Circuits.

EEM 482 Fundamentals of Data Networks 3+0 5,0
Fundamentals of ISO Reference Model: Layered Structure in Networking; Physical Layer Fundamentals: Bit-rate, Baud-rate; Electrical Data Transfer Methods; Multiplexing; Data Link Layer Fundamentals: Basic protocols, Sliding windoe protocol and data transfer protocols, Fundamentals of rate-based control and algorithms, Examples of protocols; Network Layer Fundamentals: Datagram and virtual circuits;

Routing Algorithms and Efficiency; Fundamentals of TCP/IP: Protocol layers, Packet addressing, Applications of TCP/IP; Socket Interface; Telnet; Ftp; E-mail.

EEM 483 Power Systems Analysis II 2+2 5,0
Power Flow Calculations; Jacobi, Gauss and Newton-Raphson Solution Techniques; Symmetrical and Asymmetrical Short Circuits; Power Systems Controls ; General- Voltage Control; Load -Frequency Control; Transient Operation and Stability of Transmission Lines; Lossy and Lossless Lines; Multiconductor Lines; Insulation Coordination; Transient Model of Synchronous Machine.

EEM 484 Integrated Circuit Design 3+0 5,0
Fundamentals of Design of Integrated Circuits; Design Techniques of Large Scale Integrated Circuits (LSI); Design Techniques of Very Large Scale Integrated Circuits (VLSI); Bi-Polar Integrated Circuits; MOS Technology and Logic; PMOS, NMOS and CMOS Technologies and Utilization of These Technologies in Integrated Circuits; Structural Design; Design Rules; Placement Methods; Computer Aided Integrated Circuit Design; Simulation of Integrated Circuits; Timing.

EEM 485 Digital Electronic Circuits 3+0 5,0
Large Signal Transistor Models; TTL Logic Gates; MOS Logic Gates; CMOS Logic Gates; Inverters; Input and Output Circuits; NAND Gate; NOR Gate; Stability Analysis; Flip-Flops; Astable Multivibrators; Monostable Multivibrators; Bistable Multivibrators; Schmitt Triggers; Memories: RAM, ROM, EPROM, EEPROM; Analogue-Digital and Digital-Analogue Converters.

EEM 486 Computer Architecture 3+0 5,0
Performance: Measuring performance, Performance metrics, SPEC benchmarks, Comparing and summarizing performance; MIPS Instruction Set Architecture; Arithmetic for Computers: ALU design, Integer multiplication and division, Floating point operations; The Processor: Single cycle datapath design, Controller design for a single cycle datapath, Multicycle datapath design, Controller design for a multicycle datapath; Pipelining: A pipelined datapath and its control, Data hazards and forwarding, Data hazards and stalls, Branch hazards; Caches: Basics of caches, Measuring and improving cache performance.

EEM 489 Microprocessors II 2+2 5,0
32 Bits Microprocessors; Motorola 68K Series; Command Subsets; Index Modes; 32 Bits Programming; 68K Hardware Elements; Data Buses; Address, Data and Control Buses; Interrupt Definition; Address Analysis; Direct Memory Access; Serial Communication; Digital to Analogue Conversion; Parallel Ports; Arithmetic Operations; Microprocessor Buses VME; General Microprocessor System Design.

EEM 490 Nonlinear Systems 3+0 5,0
Phase Plane Analysis: Constructing phase portraits, Phase plane analysis of nonlinear systems, Existence of limit cycles; Fundamentals of Lyapunov Theory: Equilibrium points, Concepts of stability, Linearization and local stability, Lyapunov's direct method, System analysis based on Lyapunov's direct method; Advanced Stability Theory: Concepts of stability for non-autonomous systems, Lyapunov analysis of non-autonomous systems, Instability theorems, Existence of Lyapunov functions, Positive linear systems and the passivity formalism, Absolute stability; Describing Function Analysis.

EEM 491 Linear Control Systems 3+0 5,0
Frequency Response of Linear Systems; Nyquist Criteria; Stability Margins; Lead and Lag Compensator Design; Sensitivity Analysis and Robust Control; Response of Linear Time - Varying Systems; Controllability and Observability; Controllable and Observable Modes; Stabilizability and Detectability; Kalman's Decomposition; Pole Placement by State Feedback; Observers; Pole Placement by Dynamic Output Feedback; Disturbance Rejection and Asymptotic Reference Signal Tracking; Servomechanism Problem.

EEM 493 Digital Control Systems 3+0 5,0
Sampling and Reconstruction; Digital-Analog and Analog-Digital Conversions; Data Sampling Systems; Effect of Sampling Frequency on System Response and Choice of Sampling Frequency; Transient Response of Discrete Time Systems; Steady-State Response of Discrete Time Systems; Frequency Response of Discrete Time Systems; Multi-Rate Sampled Data Systems; Quantization Errors; Pole Placement; Observers; Performance Criteria; Optimal Control; Design of Dynamic Controllers.

EEM 494 Control Systems Laboratory 1+4 5,0
Industrial Control Applications; Control System Design and Implementation for Examples of Industrial Systems; Analog Controller Design and Implementation for Linear and Non-Linear Systems; Digital Implementation of Analog Controllers; Digital Controller Design for Analog Systems; Choice of Sampling Frequency; Effect of Quantization Errors on System Performance; Utilization of Microprocessors and Programmable Logic Controllers in Control Applications.

EEM 495 Network Synthesis 3+0 5,0
System Function; Impulse Response of RC, RL, RLC and LC Circuits; Frequency Response of RC, RL, RLC and LC Circuits; Synthesis of RC Circuits; Synthesis of RL Circuits; Synthesis of RLC Circuits; Synthesis of LC Circuits; Ladder Circuits; Filters; Bandwidth and Quality Factor; Design and Realization of Low-Pass Filters; Design and Realization of Band-Pass Filters; Design and Realization of Band-Stop Filters; Computer Aided Circuit Synthesis.

EEM 496 Communications Systems Laboratory 1+4 5,0
AM Modulation, DSB Modulation, SSB Modulation; Noise in AM Systems; Frequency Modulation; Transmitters - Receivers; FM Stereo Systems; Noise in FM Systems; PSK and FSK Modulation; Digital Communication Subsystems: Sampling, Quantization and Reconstruction; PCM and PWM Systems; Noise in Digital Systems; Coding; Troubleshooting.

EEM 497 Communication Systems I 3+0 5,0

Development of Analog and Digital Systems; Signals; Noise and Spectra; Fourier Transform; Random Processes; Power Spectral Density; Correlation Functions; Input and Output Relations in Linear Systems; Signal-to-Noise Ratio; Amplitude Modulation; Double Side Band Transmitter (DSB); Single Side Band Transmitter (SSB); Phase (PM) and Frequency Modulation (FM); Bilateral Phase-Shift Keying (BPSK); PSK; Frequency-Shift Keying (FSK), Frequency Division Multiplexing and FM

EEM 498 Communication Systems II 3+0 5,0

Historical Development of Digital Systems; Sampling Theorem; Binary Coding; Pulse-Amplitude Modulation; Pulse-Code Modulation; Sampling, Quantization, u-Law and A-Law of Coding Processes; Line Coding; Inter-Symbol Interference (ISI); Delta Modulation; Time-Division Multiplexing (TDM); Pulse-Width Modulation (PWM); Noise Effects on Digital Systems; Error Rate of Binary-Signals.

ENM 102 Introduction to Industrial Engineering 2+0 3,0

Engineering: Industrial engineering, Definitions of task and progress, Topics in Industrial Engineering: Manpower, Capital, Technology Relations, Mutual interaction, Goods and Service Production, Company, Company types, Industrial company; Productivity: Productivity management, Labor study, Time study, Labor evaluation, Labor and Wage; Statistics; Quality and Quality Control; Ergonomics; Facility Planning; Operation Research; use computers in Industrial Engineering.

ENM 104 Introduction to Computation and Programming for Industrial Engineering 2+2 4,5

Introduction to Computer: History of computers, Components of computers; Fundamentals of Algorithms; Pseudocode and Flowcharts; Basic Elements of Programming; Branching Programs; String and Input; Iteration; Some Simple Numerical Programs; Functions, Scoping and abstraction; Structured Types: Tuples, Lists; Algorithm Design and Numerical Solutions of Some Industrial Engineering Problems.

ENM 203 Linear Programming 2+2 5,5

Methodology of Operations Research; Assumptions of Linear Programming; Modeling with Linear Programming; Graphical Solution; Simplex Algorithm; Big M Method; Two-Phase Simplex Algorithm; Revised Simplex Algorithm; Duality: Primal- dual relationship, Dual simplex algorithm; Sensitivity Analysis; Solution of Linear Decision Models with Computer Software.

ENM 212 Integer Programming and Network Models 2+2 6,0

Transportation Models: Transportation table; Assignment Models; Hungarian Algorithm; Network Models; Shortest Path Problem; Minimum Spanning Tree Problem; Maximum Flow Problem; Critical Path Problem; Dynamic Programming; Integer Programming; 0-1 Integer and Mixed Integer Programming; Branch and Bound Algorithm; Branch and Cut Approach; Solution of 0-1 Integer Programming Problems with Computer Software.

ENM 214 Manufacturing Methods and Material Selection 3+2 5,0

Specifications of Materials Used in Engineering: Geometrical, physical, mechanical (static and dynamic), chemical specifications; Engineering Material Selections According to Place; Lathing: Lathes leveling, Lathing processing, Cutting tools, Metal filings, Cutting power; Shape Slots; Processing Principles; Welding: Welding techniques, Oxygen welding, Electric arc welding; Grinding; Drill Holes; New Machining Processes; Automation (NC, CNC, CAD/CAM, CIM).

ENM 214 Manufacturing Methods and Material Selection 3+2 5,0

Specifications of Materials Used in Engineering: Geometrical, physical, mechanical (static and dynamic), chemical specifications; Engineering Material Selections According to Place; Lathing: Lathes leveling, Lathing processing, Cutting tools, Metal filings, Cutting power; Shape Slots; Processing Principles; Welding: Welding techniques, Oxygen welding, Electric arc welding; Grinding; Drill Holes; New Machining Processes; Automation (NC, CNC, CAD/CAM, CIM).

ENM 301 Work Study 3+0 4,0

Historical Development of Work Study; The importance of ergonomics in work study; concepts in Work study and method study; Work flow diagram, steps of work division and measurement; Determining standard time; Fatigue factor; Synthetic times (MTM, WF, MTA etc.), chronometer method; Applications of method study and work measurement.

ENM 301 Work Study 3+0 4,0

Historical Development of Work Study; The importance of ergonomics in work study; concepts in Work study and method study; Work flow diagram, steps of work division and measurement; Determining standard time; Fatigue factor; Synthetic times (MTM, WF, MTA etc.), chronometer method; Applications of method study and work measurement.

ENM 304 Investment Planning and Analysis 4+0 6,0

Investment Concepts in Types of investments; Preparation of investment projects; Evaluation of Investment Projects: Static, Dynamic and multi-criteria evaluation methods; Feasibility; Cost-Benefit Analysis; Optimum Investment Planning; Investments of Establishments and Individuals; Measurement of risk and gain; Stock and money exchange; Investment evaluation process and techniques; Comparison of investment alternatives; Portfolio Theory and its applications.

ENM 306 Stochastic Models 3+0 4,5

Definition of Stochastic Processes; Markov Chain; Chapman-Kolmogorov Equations; Transition Matrices; Classification of States of Markov Chain; Queuing Theory; Exponential Distribution; Birth and Death Process; Queuing Models Involving Exponential Distribution; Queuing Models Involving Nonexponential Distribution; Analytical Solution Methods of Queuing Models; Priority Discipline Queuing Models; Queuing Networks; Queuing Systems.

ENM 307 Simulation 2+2 6,0

Methodology of Simulation; Simulation Models; Monte Carlo Simulation, Discrete and continuous time simulation; Selection of input probability distribution, Production of random numbers; Data analysis of a system output; Statistical comparison of similar systems. Model events; Introduction to simulation languages; Usage and application of SIMAN and ARENA.

ENM 308 Production Planning and Control I 4+0 5,0

Introduction to Strategic planning, Competition superiority; Concepts of Productivity and Efficiency. Basic concepts in production planning and control; Demand estimates; Capacity analysis; Collective planning; Source balancing; Time and cost balancing; Assembly line balancing methods.

ENM 309 Industrial Information Systems 3+0 6,0

Database; Introduction to Access Database: Commands, Properties, Table Properties, Construction of Tables, Data Processing; Access Programming, Combining Industrial Engineering Applications with database; Functional Structure Design Specification Methods: IDEF0 Method; Information Structure and Logical Database Design: IDEFIX Method, Design and Modeling Information Systems; Automated Data Collection Systems (SCADA, Barcode etc.) Integration of Information Systems with database used for production and control.

ENM 310 Experiment Design and Regression Analysis 3+0 4,5

Experiment Design and Analysis: Variance analysis with one factor, two factors, several factors; Hypothesis Tests for Significance of the Model; Model Adequacy Test; Comparisons Among Treatment Means; Simple and Multiple Linear Regression Analysis: Estimation of model parameters by least square methods and by matrix; Estimation of Standard Error; Hypothesis Tests for Significance of Regression; Hypothesis Tests for Significance of Regression Parameters; Residual Analysis; Polynomial Regression Models; Correlation; The Coefficient of Determination; Selection of Variables in Multiple Regression: Forward selection, Backward elimination, Stepwise selection; 2k factorial design and analysis.

ENM 310 Experimental Design and Regression Analysis 3+0 4,5

Experiment Design and Analysis: Variance analysis with one factor, two factors, several factors; Hypothesis Tests for Significance of the Model; Model Adequacy Test; Comparisons Among Treatment Means; Simple and Multiple Linear Regression Analysis: Estimation of model parameters by least square methods and by matrix; Estimation of Standard Error; Hypothesis Tests for Significance of Regression; Hypothesis Tests for Significance of Regression Parameters; Residual Analysis; Polynomial Regression Models; Correlation; The Coefficient of Determination; Selection of Variables in Multiple Regression: Forward selection, Backward elimination, Stepwise selection; 2k factorial design and analysis.

ENM 312 Manufacturing Systems Analysis 3+0 5,0

Introduction and Basic Concepts; Evaluation of Manufacturing Systems: Overall system performance, Evaluation criteria in manufacturing, Modeling and simulation of manufacturing systems, Analysis of production lines, Assembling and line balancing; Design of Manufacturing Systems; Computer Integrated Manufacturing Systems: NC, CNC and DNC systems; Parts Programming; Introduction to CAD/CAM Systems: Computer aided quality (CAQ) systems, Robots and analysis of robotics; Operation of Systems; Trends in Manufacturing Systems: Modern manufacturing technologies, Principles of group technology and cellular manufacturing, Factory of the future.

ENM 313 Mathematical Programming Models in Engineering 3+0 4,5

Introduction to Linear Programming: Problem statement, Basic definitions, Linear programming, Problem in standard form, Basic solutions, Sensitivities, Duality; Understanding the Set of all Feasible Solutions; Convex Sets: Linear spaces, Polyhedral convex cones, Polytopes, Polyhedra; Bounded and Unbounded LPP: Models and GAMS package, Transportation problem, Production scheduling problem, Diet problem, Network flow problem, Portfolio problem, The 0-1 knapsack problem, Academy problem and school timetable problem, Identifying relevant symptoms, Models of discrete location.

ENM 315 Nonlinear Programming 2+2 6,0

Nonlinear Programming; Convex Function; Concave Function; Convex Set; One-Variable Unconstrained Models; Bisection Method; Newton Method; Multivariable Unconstrained Optimization; Gradient Search Method; Multivariable Constrained Optimization; Karush-Kuhn-Tucker Conditions; Convex Programming; Frank-Wolfe Algorithm; Sequential Unconstrained Minimization Technique (SUMT).

ENM 317 Engineering Statistics 3+0 4,5

Data: Classified Data; Mean; Distribution Measurements; Sampling: Sampling error, Sampling distribution, t Distribution, F Distribution, Chi-Square test; Statistical Estimation: Estimation of population parameter, Point estimation, Confidence interval estimation; Hypothesis Testing: Hypothesis tests for means, proportions and variances, Hypothesis testing for small and large samples; Nonparametric Statistical Testing: Sign test, Sign test for large samples, Sign test for paired observation, Wilcoxon sign ranking test; Goodness of Fit: Test of Chi-Square,

Kolmogorov-Smirnov test, Independence test, Homogeneity test.

ENM 317 Engineering Statistics 3+0 4,5
Data: Classified Data; Mean; Distribution Measurements; Sampling: Sampling error, Sampling distribution, t Distribution, F Distribution, Chi-Square test; Statistical Estimation: Estimation of population parameter, Point estimation, Confidence interval estimation; Hypothesis Testing: Hypothesis tests for means, proportions and variances, Hypothesis testing for small and large samples; Nonparametric Statistical Testing: Sign test, Sign test for large samples, Sign test for paired observation, Wilcoxon sign ranking test; Goodness of Fit: Test of Chi-Square, Kolmogorov-Smirnov test, Independence test, Homogeneity test.

ENM 401 Production Planning and Control II 4+0 5,0
Collective Production Planning Models; Inventory Models and Inventory Management; Work Loading and Balancing; Final Capacity Planning, Scheduling; Materials Requirements Planning; MRP-SAP Applications, Manufacturing Scheduling; Manufacturing Resource Planning; Just-In-TimeProduction Systems; Flexible Manufacturing Systems.

ENM 407 Systems Analysis 3+0 5,0
Introduction to Systems; System Engineering; Design of Conceptual Systems: Needs Analysis; Feasibility Analysis; Functional Analysis; Synthesis And Evaluation; System Specification; Preparing For System Design: Functional analysis of sub systems, Design parameters; Detailed System Design and Development: Detailed design needs, Combining system elements, Design engineering activities, Detail design equipment, Documentation of design and development of a prototype; Testing The Systems And Evaluation; System Analysis Tools; Alternatives And Models of Decision-Making; Or Economical Evaluation Models, Optimization of Design And Operations

ENM 411 Facility Planning 3+0 4,5
Facility Location Selection; Numerical Analysis of Facility Location Problem; Analysis of Models; Facility Location Projects, Project Management Techniques; Design of Layout; Required Knowledge And Analysis; Activity Grouping And Department Designation. Material; Handling System; Determining Equipment, Manpower and Area Requirements; Computer Aided Facility Planning.

ENM 411 Facilities Planning 3+0 4,5
Facility Location Selection; Numerical Analysis of Facility Location Problem; Analysis of Models; Facility Location Projects, Project Management Techniques; Design of Layout; Required Knowledge And Analysis; Activity Grouping And Department Designation. Material; Handling System; Determining Equipment, Manpower and Area Requirements; Computer Aided Facility Planning.

ENM 413 Planning and Scheduling in Manufacturing and Service Systems 3+0 4,0
Introduction to Scheduling: Manufacturing models and service models; Exact Optimization Methods and Heuristic Solution Techniques; Project Planning and Scheduling; Machine Scheduling and Job Shop Scheduling; Economic Lot Scheduling; Scheduling and Timetabling in Sports; Timetabling in Educational Systems; Planning, Scheduling and Timetabling in Transportation; Workforce Scheduling.

ENM 415 Design, Creativity and Innovation 3+0 4,5
Industrial design basic concepts; Design theories and methods: pratic solitions, solve the problem; Design of product; Creativity; Innovation: conversion to the profitable product/ service, relationship of marketing; Creativity Methods; converting the creativity opinion to the innovation; Intellectual Property: patent, register of design; Entrepreneurship: job scheduling, goverment aid, challenges and risks; Management of the innovation.

ENM 420 Service Systems 3+0 4,5
Definition of Service Systems; Fundamental Components; Properties of Service Systems; Operation Characteristics in Service Systems; Queue models; Quality in Service; Customer Fidelity; Performance Criterion in Service Systems.

ENM 420 Service Systems 3+0 4,5
Definition of Service Systems; Fundamental Components; Properties of Service Systems; Operation Characteristics in Service Systems; Queue models; Quality in Service; Customer Fidelity; Performance Criterion in Service Systems.

ENM 426 Ergonomics 3+0 4,5
Concept of Ergonomics; Human Body: Movement systems, Nervous systems, Perceptive organs, Energy needs; Practical Anthropometrics; Environment at the Work Place: Temperature, Humidity, Air Activities, Lighting, Noise, Vibration; Relation Between Ergonomics And Work Study; Components of Human-Machine Systems; Principles of Ergonomics At Work; Engineering Anthropometrics; Role of Ergonomics On Quality And Productivity; Energy Needed During work.

ENM 427 Special Topics in Industrial Engineering 1+2 5,0
Basic Techniques in Industrial Engineering: Work analysis, Engineering economy, Statistical quality control, Production planning and control, Material handling, Production models, Decision models and analysis, Statistical analysis techniques; Application of These Techniques to Manufacturing Problems; Analysis of Methods and Results.

ENM 427 Special Topics In Industrial Engineering 1+2 5,0
Basic Techniques in Industrial Engineering: Work analysis, Engineering economy, Statistical quality control, Production planning and control, Material handling, Production models,

Decision models and analysis, Statistical analysis techniques; Application of These Techniques to Manufacturing Problems; Analysis of Methods and Results.

ENM 428 Industrial Engineering Applications 2+4 8,0
Preliminary Research on the Topic Chosen under the Guidance of an Advisor; Literature Survey about the Topic; Data Collection and Analysis; Theoretical and/or Experimental Works about the Chosen Topic; Reporting the Results; Presentation of the Results; Oral Presentation.

ENM 428 Industrial Engineering Applications 2+4 8,0
Preliminary Research on the Topic Chosen under the Guidance of an Advisor; Literature Survey about the Topic; Data Collection and Analysis; Theoretical and/or Experimental Works about the Chosen Topic; Reporting the Results; Presentation of the Results; Oral Presentation.

ENM 430 Cognitive Ergonomics 3+0 4,5
Introduction to human factors; Human Information Processing; Visual and Auditory Sensory Systems; Cognition; Memory; Attention and Perception; Decision Making; Mental Workload; Human Error; Situational Awareness; Stress; Motivation and Job Satisfaction; Potential Applications of Cognitive Ergonomics.

ENM 431 Advanced Production Systems 3+0 4,5
Definition of production system; Traditional and Group Technology Production Systems; New Production Systems: Lean Production Systems and Toyota Philosophy; Learning to see, Value Stream Map , TAKT time, Group Technology, Cellular Production System, Flexible Manufacturing System, Agile Production System; Concept of Constraints, Green Production, Recycle approach.

ENM 432 Lean Thinking and Lean Manufacturing Management 3+0 4,5
Manufacturing Systems; History of Manufacturing Systems; 7 base muda's; Muda's caused production activities ; What is the important non value added activities; How many techniques will be used to remove mudas; Value; Value Flow; Value Flow Maps; Kanpan; One piece flow; TAKT Time; Labor efficiency; Inventory reducing; Lean Six sigma Phases

ENM 435 Engineering Seminars I 0+2 1,0
Series of seminars where industrial engineers working at service and manufacturing sectors and academicians at national and international universities share their knowledge and experience with students.

ENM 435 Engineering Seminars I 0+2 1,0
Series of seminars where industrial engineers working at service and manufacturing sectors and academicians at national and international universities share their knowledge and experience with students.

ENM 437 Structural Equation Modeling 3+0 4,5
Structural Equation Models: Terminology and Application Areas; Basic Theory of Principal Components Analysis, Exploratory and Confirmatory Factor Analyses and Their Applications; Path Analysis; Models with Only Manifest Variables; Models With Latent Variables and General Models; Model Specification; Model Identification and Model Estimation; Evaluation and Development of Models: Model fit indices, Model testing and model modifications; Application Tools and Techniques of Structural SEM.

ENM 438 Industrial Scheduling 3+0 4,5
Importance of Sequencing and Scheduling; Classification of Scheduling Problems; Single Machine Scheduling: Commonly used dispatching rules, Backward-forward heuristic, Early and late penalties, Common due date; Sequence Dependent Jobs; Parallel Machine Scheduling: Sequence dependent setup times, Assembly line balancing problem; Flow Shop Scheduling: The two machine problem, The three machine problem, The n job-m machine problem; Job-Shop Scheduling; Network Based Scheduling; Manpower Scheduling: Monroe?s algorithm; Special Scheduling Problems.

ENM 440 Introduction to Data Mining 3+0 4,5
Introduction; Data: Types of data, Data preprocessing, Measures of similarity and dissimilarity; Exploring Data: The iris data set, Summary statistics, Visualization, OLAP and multidimensional data analysis; Classi?cation: Basic concepts, Decision trees, Model evaluation, Nearest-neighbor classi?ers, Bayesian classi?ers, Arti?cial neural network (ANN), Support vector machine (SVM), Multiclass problems; Association Analysis: Basic concepts, Frequent item set generation; Cluster Analysis: Basic concepts, K-means, Cluster evaluation; Anomaly Detection: Statistical approaches, Clustering-based techniques.

ENM 442 Decision Analysis 3+0 4,5
Decision Theory; Classification of Decision Problems; Decision Environments: Decision-making under uncertainty, Decision-making under risk; Utility Theory: Axioms of utility theory; Decision Trees: Use of decision tress under certainty, uncertainty and risk; Complete and Incomplete Information: Expected value of information; Decision-making in Multi-Criteria Environment; Multi-Objective Optimization Problems; Goal Programming.

ENM 444 Supply Chain Modeling And Analysis 3+0 4,5
Fundamentals of Supply Chain Management; Supply Chain Operations: strategic, tactical, and operational; Network Design in The Supply Chain: vehicle routing, transportation, facility location, capacity planning; Planning and Managing Inventories in a Supply Chain: Cycle inventory, safety inventory, determining the optimal level; Supply Chain Analysis; Management of Uncertainty in Supply Chain; Measuring Supply Chain Performance, Supplier Relationship Management; Supply Chain Management Softwares.

ENM 446 Enterprise Resource Planning 3+0 4,5
System Modelling; Data Flow; Database and Relations, Data and process modelling; Information Processing, Information processing phases, Information processing methods; Information System Applications: Enterprise resource planning, Enterprise resource planning modules: Material management, Production planning, Sales and distribution management, Warehouse management, Quality management, Customer relationship management, Service management, Human resource management, Financial modules; Application of Modules.

ENM 448 Project Planning and Management 3+0 6,0
Project Management and its Steps; Project Management Process: Scoping agreement, Requirement statements, Task list, Work breakdown structure, Milestones; Developing a Plan and Scheduling a Project: CPM-PERT; Scheduling Resources and Costs; Reducing Project Duration; Leadership and Project Teams; Monitoring Project: Progress and Performance Measurement and Evaluation; Project Closure.

FEL 102 Introduction to Philosophy 2+0 2,5
Fundamentals of Philosophy; Scope of Philosophy; History of Philosophy; Theory of Science; Theory of Knowledge; Logic; Ontology; Philosophy of Nature; Philosophy of History; Philosophy of Art; Philosophy of Language; Philosophical Anthropology; Ethics; Philosophy of Religion; Metaphysics; Schools of Philosophy; Development of Philosophical Perspective.

FEL 102 Introduction to Philosophy 2+0 2,5
Fundamentals of Philosophy; Scope of Philosophy; History of Philosophy; Theory of Science; Theory of Knowledge; Logic; Ontology; Philosophy of Nature; Philosophy of History; Philosophy of Art; Philosophy of Language; Philosophical Anthropology; Ethics; Philosophy of Religion; Metaphysics; Schools of Philosophy; Development of Philosophical Perspective.

FEL 401 Philosophy of Science 2+0 2,5
Importance and Definition of Science: Science, Common Sense, Religion and philosophy, Formal disciplines, Science and Language, Scientific Method: Its content and boundaries, Various interpretations; Ways arriving at the phenomenon: Observation and experimentation, Logical structure of measurement; Scientific Explanation: Notion scientific law, Verification of hypothesis, Causal principle in science, Structure and Functions of Scientific Theory; Human-problems of Science: Responsibility of Scientist, Science and Humanism

FEL 401 Philosophy of Science 2+0 2,5
Importance and Definition of Science: Science, Common Sense, Religion and philosophy, Formal disciplines, Science and Language, Scientific Method: Its content and boundaries, Various interpretations; Ways arriving at the phenomenon: Observation and experimentation, Logical structure of measurement; Scientific Explanation: Notion scientific law, Verification of hypothesis, Causal principle in science, Structure and Functions of Scientific Theory; Human-problems of Science: Responsibility of Scientist, Science and Humanism

FİN 306 Capital Markets 2+0 3,0
Financial Markets: Basic types of financial markets, Operations in a capital market, Intermediaries; Mutual Funds, Investment Companies; Financial Instruments; Instruments in Money Markets; Instruments in Capital Markets; Istanbul Stock Exchange; Equity Market; Bond Market; Clearing and Maintenance for Stocks; Default; Quotation: Quotation Systems; Concept of Risk; Calculation of Return; Portfolio Management.

FİN 415 Financial Markets and Institutions 3+0 4,5
Financial System; Interest Rates; Efficiency in Financial Markets; Functions of Financial Institutions; Financial Crises; Central Banks; Monetary Policy: Goals, Tools; Money Markets; Bond Market: Properties of Bonds, Bond Valuation ; Stock Market: Properties of Stocks, Stock Valuation; Banking Industry: Structure and Competition of the Industry, Management of Banks ; Insurance Companies; Investment Banks; International Financial System.

FİZ 105 Physics I 4+0 6,0
Measurement and Units: Measurement, Units, Dimensional analysis; Vectors: Vector and scalar quantities, Coordinate systems and frames of reference; Kinematics: Motion in one dimension, Motion in two dimensions; Dynamics; Work and Energy; Momentum and Collisions; Rotational Motion: Angular velocity and angular acceleration, Moments of inertia, Work and energy in rotational motion; Static Equilibrium.

FİZ 105 Physics I 4+0 6,0
Measurement and Units: Measurement, Units, Dimensional analysis; Vectors: Vector and scalar quantities, Coordinate systems and frames of reference; Kinematics: Motion in one dimension, Motion in two dimensions; Dynamics; Work and Energy; Momentum and Collisions; Rotational Motion: Angular velocity and angular acceleration, Moments of inertia, Work and energy in rotational motion; Static Equilibrium.

FİZ 106 Physics II 4+0 6,0
Electric Fields: Electric charge, Coulomb's law, Electric flux, Gauss's law; Electric Potential: Potential difference, Potential energy, Obtaining the electric field from the electric potential; Capacitors: Definition and calculation of a capacitance, Capacitors with dielectrics, Energy stored in a charged capacitor, Electric dipole in an external electric field; Electric Current; Magnetic Field: Sources of the magnetic field, Electromagnetic induction.

FİZ 106 Physics II 4+0 6,0
Electric Fields: Electric charge, Coulomb's law, Electric flux, Gauss's law; Electric Potential: Potential difference, Potential energy, Obtaining the electric field from the electric potential; Capacitors: Definition and calculation of a capacitance, Capacitors with dielectrics, Energy stored in a charged capacitor, Electric dipole in an external electric

field; Electric Current; Magnetic Field: Sources of the magnetic field, Electromagnetic induction.

FİZ 107 Physics Laboratory I 0+2 1,5
SI Unit System and Dimension Analysis; Measurement and Error Calculations; Graph Analysis; Principles of Experimental Studying and Preparation of Experimental Reports; Variation of Range due to Shooting Angle; Conservation of Energy; Motion with Constant Acceleration; Measurement of Angular Velocity; Determination of Moment of Inertia; Freely Falling; Simple Pendulum; Motion on Inclined Plane; Mass-spring System; Viscosity.

FİZ 107 Physics Laboratory I 0+2 1,5
SI Unit System and Dimension Analysis; Measurement and Error Calculations; Graph Analysis; Principles of Experimental Studying and Preparation of Experimental Reports; Variation of Range due to Shooting Angle; Conservation of Energy; Motion with Constant Acceleration; Measurement of Angular Velocity; Determination of Moment of Inertia; Freely Falling; Simple Pendulum; Motion on Inclined Plane; Mass-spring System; Viscosity.

FİZ 108 Physics Laboratory II 0+2 1,5
Usage of Electrical Measuring Instruments; Security Rules in Electrical Experiments; Principles of Experimental Studying and Preparation of Experimental Reports; Parallel-Plate Capacitor; Investigation of Charge Distribution on Surface of any Conductor; Ohm's Law through DC Electric Circuits; Wheatstone Bridge; Electromagnetic Induction; Transformer; Determination of Emf and Inner Resistance; Determination of Frequency; Oscilloscope.

FİZ 108 Physics Laboratory II 0+2 1,5
Usage of Electrical Measuring Instruments; Security Rules in Electrical Experiments; Principles of Experimental Studying and Preparation of Experimental Reports; Parallel-Plate Capacitor; Investigation of Charge Distribution on Surface of any Conductor; Ohm's Law through DC Electric Circuits; Wheatstone Bridge; Electromagnetic Induction; Transformer; Determination of Emf and Inner Resistance; Determination of Frequency; Oscilloscope.

FOT 202 Photography 2+0 3,0
Introduction to Photography: Relations between architects and photography, Description of visual aspect of architecture, Use of photography in the presentation of architectural products; The camera; Process of photographing; Film Development Procedure for Black and White Films, Film Development Procedure for Colored Films and Slides; Printing Processes.

FRA 255 French I 3+0 4,0
Language Functions: Greetings, Invitations, accepting or refusing invitations; Vocabulary Knowledge: Nourishment, Accommodation, Clothing and colors, Bairams and activities; Grammar: Expressions showing quantity, Demonstrative and possessive adjectives, Prepositions and time indicators, Stressed personal pronouns, Imperatives, Verbs with double pronouns; Learning About French Culture: An area in France: La Baurgogne; Pronunciation, Semi-vowels, Gliding.

FRA 256 French II 3+0 4,0
Language functions: Imperatives and wishes; Evaluation, Proving and Thanking; Vocabulary: Nourishment, Accommodation, Clothing and colors, Bairams and activities; Ordinal Numbers; Grammar: Expressions showing quantity, Demonstrative and Possessive Adjectives, Prepositions and Time indicators, Stressed personal pronouns: Imperative moods, Verbs with double pronouns; Learning about Target Culture: An Area in France: La Bourgogne; Pronunciation: Intonation, Semi-Vowels, Gliding.

HUK 252 Labor Law 2+0 2,5
History of Labor Law; Sources and Basic Principles of Labor Code: Employee, Employer, Representative to the employer; Work place; Contract of Service: Types and termination, Consequences of termination, Severance pay; Regulation of Work with regard to Workers; Groups to be Protected (Women, Children, Handicapped and Sentenced Workers); Health and Security at the Work Place; Working Time; Overtime Work; Night Work; Preparing, Completing and Cleaning at Work.

HUK 252 Labor Law 2+0 2,5
History of Labor Law; Sources and Basic Principles of Labor Code: Employee, Employer, Representative to the employer; Work place; Contract of Service: Types and termination, Consequences of termination, Severance pay; Regulation of Work with regard to Workers; Groups to be Protected (Women, Children, Handicapped and Sentenced Workers); Health and Security at the Work Place; Working Time; Overtime Work; Night Work; Preparing, Completing and Cleaning at Work.

HUK 458 Industrial Rights and Technological Development 3+0 3,0
Overall look at the intellectual systems; General principles of industrial rights; The categories of industrial rights; Patent, trademark; industrial design; Topographies of integrated circuits; Protection of microorganisms; Discussion on the "invention" concept; Background motivation of inventions; Use of inventions in daily life; The rights of the inventors; Special work on the patent system; The use of patent system in production by the engineers; Use of patent archives; Search for invention whether it is patentable or not; Preparing a patent file.

İKT 151 Economics 3+0 3,0
Basic Economic Concepts; Production Process; Optimal Consumer Behavior; Demand; Supply; Equilibrium Price; Market Types; Determination of Factor Prices; National Product; Nominal and Real National Income; Introduction to Monetary Theory; Factors Determining Fluctuation and National Income: Consumption expenditures, Investment expenditures, Employment; International Economic Relations: International mobility of goods and services,

International mobility of factors of production; Economic Growth and Development.

İKT 151 Economics 3+0 3,0
Basic Economic Concepts; Production Process; Optimal Consumer Behavior; Demand; Supply; Equilibrium Price; Market Types; Determination of Factor Prices; National Product; Nominal and Real National Income; Introduction to Monetary Theory; Factors Determining Fluctuation and National Income: Consumption expenditures, Investment expenditures, Employment; International Economic Relations: International mobility of goods and services, International mobility of factors of production; Economic Growth and Development.

İKT 209 Money and Banking 3+0 5,0
Basic Concepts of Financial System; Difficulty in Defining Money; Asset- Demand Theory and Determination of Equilibrium Interest Rates; Risk, Term and Tax Structure of Interest Rates; Bank as a Firm: Asset and liability management in banking, Exchange rate risk and interest rate risk and risk management, Balance sheet of a bank and Creation of deposit; Role of House holds; Banks and Central Bank in Mechanism of Money Stock Determination; Tools of Monetary Policy; Money Demand Theories and the Equilibrium in Money Market.

İKT 356 Engineering Economics 3+0 4,5
Principles of Engineering Economics; Time Value of Money; Investment Problems; Capital Formation by Installments; Capital Formation; Consumer Loans; Payments with Equal Installments; Basic Evaluation Techniques: Present Worth Method; Internal Rate of Return Method; Comparison of Alternative Investment Decisions; Breakeven Analysis; Replenishment Investments.

İKT 427 Industrial Economics 2+0 3,0
Industrial Market Structure and Economic Performance; Determinants of Market Structure; Determinants of Behavior and Performance; Acts of Firms in Different Industrial Structures; Overt and Covert Agreements; Entry to and Exiting from a Market; Pricing Strategies and the Market Power; Game theory.

İLT 201 Interpersonal Communication 3+0 4,5
Verbal Communication; Speaking Skills As Dimension of Interpersonal Communication; Listening Capabilities As Dimension of Interpersonal Communication; Non-Verbal Communication; Signs And Meanings; Stress And Stress Management; Group; Group Dynamics; Small Group Characteristics; Persuasion; Speaking And Listening; Time And Time Management; Interpersonal Communication; History of Communication Research.

İLT 201 Interpersonal Communication 3+0 4,5
Verbal Communication; Speaking Skills As Dimension of Interpersonal Communication; Listening Capabilities As Dimension of Interpersonal Communication; Non-Verbal Communication; Signs And Meanings; Stress And Stress Management; Group; Group Dynamics; Small Group Characteristics; Persuasion; Speaking And Listening; Time And Time Management; Interpersonal Communication; History of Communication Research.

İLT 370 New Approaches in Management 3+0 6,5
Paradigm Changes in Management; System Approach; Organization Culture; Reconstruction; Total Quality Management; Team Work and Organization; Learning Organization; E-Business.

İNG 250 Reading and Speaking in English 2+0 2,0
Combining reading and speaking skills; Reading and Discussing Contemporary texts; Reading Strategies: Skimming, Scanning, Guessing Meaning from the Context; Speaking Activities Based on the Readings

İNG 360 English for Business 2+0 2,0
Developing Business English Skills for Variety of Situations: Speaking to people in business situations; Practice in planning and writing letters, Telexes and memos; Practice in Making Different Kinds of Calls; Writing and Summarizing Reports; Ordering and Supplying Goods or Services; Going on Business Trips and Guiding Foreign Visitors; How to do Market Research and Promotion; Participating in Group Meetings; Informal One-to-one Meetings and Committee meetings.

İNŞ 101 Introduction to Civil Engineering 2+0 3,5
History of Civil Engineering; Introduction to Main Divisions of Civil Engineering Department; Engineering Materials; General Properties of Mechanical Behaviour; Theoretical and Experimental Studies; Taking and Analysing of Experimental Data; Selected Examples from the Design and Construction Site; Written and Oral Communication in Civil Engineering; Engineering Judgement; Evaluation with Department.

İNŞ 101 Introduction to Civil Engineering 2+0 3,5
History of Civil Engineering; Introduction to Main Divisions of Civil Engineering Department; Engineering Materials; General Properties of Mechanical Behaviour; Theoretical and Experimental Studies; Taking and Analysing of Experimental Data; Selected Examples from the Design and Construction Site; Written and Oral Communication in Civil Engineering; Engineering Judgement; Evaluation with Department.

İNŞ 238 Introduction to Transportation Planning 2+0 3,5
Introduction: Transportation types and history, Transportation and society, Transportation habits; Definition of Transportation Systems and Properties: Systems of passenger and load-carrying, Systems of city transportation, General concepts of transportation types; Introduction to Transportation Planning: Organization and management; Stages of Transportation Planning: Trip generation, trip distribution, Modal split, Traffic assignment; Transportation Capacity and Planning: Smart transportation systems; Preliminary Information and Description of Railway and Rail System.

İNŞ 239 Law and Ethics in Civil Engineering 3+0 3,0
A Brief History of Ethics; Introduction to Ethical Conflicts; Values and Value Systems/History of Engineering Profession; Engineering and Ethics; Environmental Ethics; Ethics, Liability and Legel Issues for Civil Engineers; Case Studies for Engineering Ethics; Introduction to Law in Construction Sector; Origins of the Construction Disputes; Construction Claims; Categories of Construction Problems; Resolution of Disputes; Productivity Dispute Relations; Disputes Arises From Project Change Orders; Reflections of Disputes to Parties.

İNŞ 239 Law and Ethics in Civil Engineering 3+0 3,0
A Brief History of Ethics; Introduction to Ethical Conflicts; Values and Value Systems/History of Engineering Profession; Engineering and Ethics; Environmental Ethics; Ethics, Liability and Legel Issues for Civil Engineers; Case Studies for Engineering Ethics; Introduction to Law in Construction Sector; Origins of the Construction Disputes; Construction Claims; Categories of Construction Problems; Resolution of Disputes; Productivity Dispute Relations; Disputes Arises From Project Change Orders; Reflections of Disputes to Parties.

İNŞ 241 Materials Science in Civil Engineering 3+0 5,0
Atomic Structure; Arrangement of the Atoms; Structural Defects: Point defects, Dislocations, Planar defects; Mechanical Tests and Properties: Tension, Compression, Impact test, Hardness, Fatigue; Deformation of the Materials; Metallography: Preparation of the samples, Observation with optic and electron microscope; Treatment Increasing the Strength of the Materials; Solidifying and Cooling Curves, Phase diagrams; Iron Alloys: Steels, Cast irons, Heat treatments; Metals and Alloys Excluding Iron: Aluminum, Titanium, Copper alloys, Composite Materials.

İNŞ 302 Reinforced Concrete I 3+2 6,0
Concrete and Steel Materials; Basic Behavior of Reinforced Concrete; Principles of Calculation; Elastic Theory and Ultimate Strength Theory; Structural Safety; Axially Loaded Members; Ultimate Strength of Members Subject to Flexure; Combined Flexure and Axial Load Columns; Shear-Diagonal Tension; Torsion; Shear and Flexure; Bond and Anchorage.

İNŞ 302 Reinforced Concrete I 3+2 6,0
Concrete and Steel Materials; Basic Behavior of Reinforced Concrete; Principles of Calculation; Elastic Theory and Ultimate Strength Theory; Structural Safety; Axially Loaded Members; Ultimate Strength of Members Subject to Flexure; Combined Flexure and Axial Load Columns; Shear-Diagonal Tension; Torsion; Shear and Flexure; Bond and Anchorage.

İNŞ 307 Structural Analysis I 3+2 6,0
Fundamentals of Structural Analysis; Assumptions in Structural Analysis; Loads and Supports; Classification of Structure Systems; Internal Forces in Structure Members; Determining Degree of Indeterminacy in Structural Systems; Determining Internal Forces in Statically Determinacy Systems: Simple beams, Cantilever beams, Hinged girders, Frames, Arches and frames of three hinges; Solving Live Loads Systems Using Influence Lines; Determining Internal Forces in Statically Indeterminacy Systems.

İNŞ 308 Hydrology 3+0 4,5
Hydrologic cycle: Water resources in the world, Introduction to hydrology; Precipitation: Occurence of precipitation and its measurement; Evapotranspiration; Factors influencing Evapotranspiration and Their Measurement; Infiltration: Computation of infiltration capacity, Infiltration index; Groundwater; Surface flow: Hydrologic region and surface flow, Measurement of level and velocity; Hydrographs: Characteristic Points of Flow Hydrograph; Analysis and Synthesis of Hydrograph; Statistical Analysis of Hydrologic Data.

İNŞ 309 Soil Mechanics I 3+2 6,0
Soil Aggregate; Composition of Soil; Physical and Index Properties of Soil: Atterberg limits, Plastic limit, Liquid limit and shrinkage limit; Classification of Soils; Water Area in Soil: Permeability and seepage; Effective Stress Concept: Total stress, Pore water pressure; Stress in a Soil Mass; Soil Compressibility: Consolidation settlement; Immediate Settlement; Soil Compaction: Standard proctor test and modified proctor test.

İNŞ 310 Water Supply and Sewerage 3+2 4,5
Hydrology; Collection of Surface Water: Water Supply from Rivers, Lakes and Dams; Collection of Groundwater Supply: From Hillside and Wells; Water Transmission by Pipe Lines: Hydraulics; Operations and Distribution Systems: Waste Water Collection; Sewers; Flow in Sewers and Sewer Appurtenances; Design of Sewer System; Waste Water Treatment Methods.

İNŞ 311 Transportation Engineering I 3+2 6,0
Transportation Types And Their Comparison; Description of Basis Members of Highway; Characteristics of Drivers, Pedestrians And Vehicles; Sight Distances; Highway Location Study; Reconnaissance Survey; Survey; Setting-Out; Relocation; Horizontal Curves; Vertical Curves; Profile Study; Pavement And Pavement Design; Traffic Engineering Applications; Traffic Flow And Density; Transportation Planning; Trip Generation And Distribution; Modal Split And Traffic Assignment.

İNŞ 311 Transportation Engineering I 3+2 6,0
Transportation Types And Their Comparison; Description of Basis Members of Highway; Characteristics of Drivers, Pedestrians And Vehicles; Sight Distances; Highway Location Study; Reconnaissance Survey; Survey; Setting-Out; Relocation; Horizontal Curves; Vertical Curves; Profile Study; Pavement And Pavement Design; Traffic Engineering Applications; Traffic Flow And Density; Transportation Planning; Trip Generation And Distribution; Modal Split And Traffic Assignment.

İNŞ 312 Construction Engineering and Management 3+0 4,5
Structure of Construction Firms; Management Functions; Management Techniques of Small -size And Family Owned Construction Companies; Process of Construction Contract And Documentation; Relationship Between Employee and Employer; Construction Safety; Project Management; Organization and Planning; Labour Law; Strike and Lock-out: Reasons; Precautions and Results of the Construction Defects; Application of Construction Cost Analysis and Estimating; Construction Bidding Principles; Site Management and Organization; Construction Projects Insurance; Change Orders and Construction Equipment Management.

İNŞ 314 Structural Analysis II 3+0 4,5
Deflections of Beams and Frames, Double Integration Method; Moment-Area Method, Conjugate Beam Method; Work-Energy Methods, Virtual work method; Castigliano's Theorems, The Method of Least Work; Force Method of Analysis, and its application to beams and frames; Force Method of Analysis, application to trusses; Three Moments Equation; Slope Deflection Method, and its application to beams and frames without sidesway; Slope Deflection Method, application to beams and frames with sidesway; Symmetrical structures with symmetrical loadings; Symmetrical structures with skew-symmetrical loadings; Moment Distribution Method and its application to beams and frames without sidesway; Moment Distribution Method and its application to beams and frames with sidesway.

İNŞ 316 Steel Structures 3+2 6,0
Introduction to Steel Structures; Structural Material: Steel; Steel Connection Tools; Bolt and Bolted Connections; Tension Members; Load and Resistance Factor Design; Connection of Tension Members; Compression Members; Effect of Combined Flexural and Axial Load on Constant Cross-Sectional Members; Truss Systems; Plate Girders: Profile Beams, Welded beams; Beam Joints; Supports and Connections; Roof Truss.

İNŞ 316 Steel Structures 3+2 6,0
Introduction to Steel Structures; Structural Material: Steel; Steel Connection Tools; Bolt and Bolted Connections; Tension Members; Load and Resistance Factor Design; Connection of Tension Members; Compression Members; Effect of Combined Flexural and Axial Load on Constant Cross-Sectional Members; Truss Systems; Plate Girders: Profile Beams, Welded beams; Beam Joints; Supports and Connections; Roof Truss.

İNŞ 318 Hydraulics 3+0 4,5
Dimensional Analysis: Pi theorem; Flow in Pipes: Motions equations, Laminar flow, Turbulent flow, Energy losses, Energy losses of various semi-radius, Local energy losses, Hydraulic calculation of pipes; Flow in Open Channels: Uniform flow, Pressure distribution in a section, Energy losses, Calculation of the uniform flow, Best hydraulic section, Varied flow, Specific energy, Critical regime, Channel and flood regime, Properties of the channel flow and flood flow, Wave velocity distribution, Definitions of channel slopes, Differential equation of free surface water, Profiles of the varied flow, Calculation of varied flow, Local variation on surface water, Hydraulic jump, Variations of the section, Other local variations, Position of the section in the nonrectangular; Channel Controls: Introduction, Gates, Sharp-edged weirs, Spillway and diversion; Model Theory: Definitions, Conditions of the resemblance, Froude models, Reynold models.

İNŞ 342 Foundation Engineering I 3+0 4,5
Soil Exploration Methods; Number of Bore Holes and Determination of their Place; Methods of Sampling; Various Institutional Experiments; Various Loading Types Concern in Foundation Design; Open Excavations; Supporting of Excavation Surfaces; Retaining Wall; Shallow Foundations; Single, Combined and Mat Foundations, Deep Foundation; Introduction to Pile Foundation.

İNŞ 342 Foundation Engineering I 3+0 4,5
Soil Exploration Methods; Number of Bore Holes and Determination of their Place; Methods of Sampling; Various Institutional Experiments; Various Loading Types Concern in Foundation Design; Open Excavations; Supporting of Excavation Surfaces; Retaining Wall; Shallow Foundations; Single, Combined and Mat Foundations, Deep Foundation; Introduction to Pile Foundation.

İNŞ 401 Reinforced Concrete Project 3+0 4,5
Introduction; Determination of Architectured Project; Slab Load Analysis; Static and Reinforced Concrete Calcutations of Slab; Beam Load Analysis; Determination of Frames; Static Analysis of Vertical Loads; Determination of Earthquake Loads; Static Analysis under Earthquake Loads; Analysis of Reinforced Concrete Beams, Columns and Foundations.

İNŞ 401 Reinforced Concrete Project 3+0 4,5
Introduction; Determination of Architectured Project; Slab Load Analysis; Static and Reinforced Concrete Calcutations of Slab; Beam Load Analysis; Determination of Frames; Static Analysis of Vertical Loads; Determination of Earthquake Loads; Static Analysis under Earthquake Loads; Analysis of Reinforced Concrete Beams, Columns and Foundations.

İNŞ 407 Reinforced Concrete II 3+0 4,5
Introduction and Definitions; Types of Slab: Plate slab, Serrated slab, Method of approximate calculations; Foundations: Wall foundations, Individual foundations, Continuous foundations, Combined foundations, Mat foundations; Retaining Walls; Selection of Types; Calculations and Projects; Simple and Continuous High Beams; Stairs; Storage: High storage, Underground storage, Circular and rectangular storage.

İNŞ 407 Reinforced Concrete II 3+0 4,5
Introduction and Definitions; Types of Slab: Plate slab, Serrated slab, Method of approximate calculations; Foundations: Wall foundations, Individual foundations,

Continuous foundations, Combined foundations, Mat foundations; Retaining Walls; Selection of Types; Calculations and Projects; Simple and Continuous High Beams; Stairs; Storage: High storage, Underground storage, Circular and rectangular storage.

İNŞ 409 Pavement Design 3+0 4,5

Theories, Priciples And Practice In The Structural Design And Construction of Highway And Airport Pavements Including Stabilization Techniques; Pavement Types, Wheel Loads And Design Factors; Stresses In Flexible Pavements; Stresses In Rigid Pavements; Vehicle And Traffic Consideration; Climate, Environment; Materials Characterization; Subgrades; Bases And Subbases; Bituminous Surfaces; Design of Pavement Evaluation Performance Evaluation Surveys And The Design of Asphaltic Mixtures; Rigid Pavement Design; Design of Flexible Airport Pavements; Design of Flexible Highway Pavements; Design of Rigid Airport Pavements; Design of Rigid Highway Pavements; AASHTO Design Methods; Shell Method.

İNŞ 409 Pavement Design 3+0 4,5

Theories, Priciples And Practice In The Structural Design And Construction of Highway And Airport Pavements Including Stabilization Techniques; Pavement Types, Wheel Loads And Design Factors; Stresses In Flexible Pavements; Stresses In Rigid Pavements; Vehicle And Traffic Consideration; Climate, Environment; Materials Characterization; Subgrades; Bases And Subbases; Bituminous Surfaces; Design of Pavement Evaluation Performance Evaluation Surveys And The Design of Asphaltic Mixtures; Rigid Pavement Design; Design of Flexible Airport Pavements; Design of Flexible Highway Pavements; Design of Rigid Airport Pavements; Design of Rigid Highway Pavements; AASHTO Design Methods; Shell Method.

İNŞ 411 Transportation Engineering II 3+0 4,5

Introduction; Railway Cars and Features; Mechanics of Traction: Equation of movement and application; Identification of Location Standard Elements; Geometric Features and Analysis; Slopes, Curves; Location Analysis: Rails, Railway Sleeper, Ballast, Top Structure Implementation; Circulation of Stones on Location; Stations: Principle of stations and railroad lines.

İNŞ 411 Transportation Engineering II 3+0 4,5

Introduction; Railway Cars and Features; Mechanics of Traction: Equation of movement and application; Identification of Location Standard Elements; Geometric Features and Analysis; Slopes, Curves; Location Analysis: Rails, Railway Sleeper, Ballast, Top Structure Implementation; Circulation of Stones on Location; Stations: Principle of stations and railroad lines.

İNŞ 413 Civil Engineering Design 3+2 4,0

Civil Engineering Projects: Conception, Planning, Design, Finance, Specifications, Contracts; Design process in civil, Geotechnical, Structural, Hydraulic and transportation engineering projects: Integration of information, Ideas, and concepts from previous courses of different disciplines into a comprehensive design effort; Methodology for formulating and solving design problems: Collection of design data, Codes and regulations; Earthquake Aspects; Project specific design criteria; Cost Estimating and Scheduling; International and national bidding processes; Ethics, Professional responsibility and legal issues for civil engineers: International Federation of Consulting Engineers (FIDIC) practices and ethical issues; Advance Design, Analysis, Detailed drawings.

İNŞ 413 Civil Engineering Design 3+2 4,0

Civil Engineering Projects: Conception, Planning, Design, Finance, Specifications, Contracts; Design process in civil, Geotechnical, Structural, Hydraulic and transportation engineering projects: Integration of information, Ideas, and concepts from previous courses of different disciplines into a comprehensive design effort; Methodology for formulating and solving design problems: Collection of design data, Codes and regulations; Earthquake Aspects; Project specific design criteria; Cost Estimating and Scheduling; International and national bidding processes; Ethics, Professional responsibility and legal issues for civil engineers: International Federation of Consulting Engineers (FIDIC) practices and ethical issues; Advance Design, Analysis, Detailed drawings.

İNŞ 414 Applications of Design in Civil Engineering 2+4 5,5

Structure, Geotechnics, Hydraulics, Hydrology, Construction Management, Transportation, Construction Materials, Soil Modelling, Slope Stability, Rock Mechanics, Soil Dynamics, Deep Excavations, Composite Materials, Materials Modelling, Advanced Concrete Technology, Calculations of Special Concrete Mixtures, Water Supply Structures, Stacastical Methods in Hydrology, Flood Controls, Dams, Steel Structures, Tall Buildings, Advanced Structural Analysis, Construction Cost Analysis, Project Management, Transportation Planning, Traffic Flow Theory, Rail Way Management.

İNŞ 414 Applications of Design in Civil Engineering 2+4 5,5

Structure, Geotechnics, Hydraulics, Hydrology, Construction Management, Transportation, Construction Materials, Soil Modelling, Slope Stability, Rock Mechanics, Soil Dynamics, Deep Excavations, Composite Materials, Materials Modelling, Advanced Concrete Technology, Calculations of Special Concrete Mixtures, Water Supply Structures, Stacastical Methods in Hydrology, Flood Controls, Dams, Steel Structures, Tall Buildings, Advanced Structural Analysis, Construction Cost Analysis, Project Management, Transportation Planning, Traffic Flow Theory, Rail Way Management.

İNŞ 415 Special Topics in Civil Engineering 2+2 3,0

Literature Review: Structure, Geotechnics, Hydraulics, Construction management, Transportation, Construction materials, Mechanics; Civil Engineering Design Principles:

Soil modelling, Foundations, Deep excavations, Advanced concrete technology, Calculations of special concrete mixtures, Water supply structures, Statistical methods in hydrology, Steel structures, Tall buildings, Advanced structural analysis, Construction cost analysis, Project management, Transportation planning, Traffic flow theory.

İNŞ 415 Special Topics in Civil Engineering 2+2 3,0
Literature Review: Structure, Geotechnics, Hydraulics, Construction management, Transportation, Construction materials, Mechanics; Civil Engineering Design Principles: Soil modelling, Foundations, Deep excavations, Advanced concrete technology, Calculations of special concrete mixtures, Water supply structures, Statistical methods in hydrology, Steel structures, Tall buildings, Advanced structural analysis, Construction cost analysis, Project management, Transportation planning, Traffic flow theory.

İNŞ 451 Geographic Information Systems (GIS) Applications in Hydrology and Hydraulics 2+2 4,5
Introduction to Geographic Information Systems; Spatial Coordinate Systems, Digital elevation models: TIN and GRID concepts for hydrologic and hydraulic studies, River and watershed networks, Soil and land use mapping, Terrain analysis for hydrologic and hydraulic modeling, 3-dimensional analysis, Flood modeling and flood plain mapping.

İNŞ 452 Computer Applications in Hydrology and Hydraulics 2+2 4,5
Investigation of Widely Used Computer Software in Hydrology and Hydraulics: Presentation of software and computer tools relevant to hydrologic and hydraulic engineering problems, Theory underlying the programs, Application and evaluation of software; Introduction to Hydrologic Modeling: Concepts of open channel flow, Data requirements, Output analysis; Emphasis on Teamwork, Project Documentation and Oral Presentations.

İNŞ 453 Railway Engineering 3+0 4,5
Rail transport systems and their characteristics; Railway vehicles and characteristics; Equation of train?s motion and applications; Route layout; Zero line; Plan and profile; Geometric characteristics of railway lines; Grades; Curves; Super elevation and transition curve; Clearance and types of cross section; Cross section and volume calculations; Mass diagrams; Earthwork balance according to General and Bruckner Method; Superstructure of railways; Rails; Sleepers; Connecting elements and ballast layer; Railways line capacity.

İNŞ 453 Railway Engineering 3+0 4,5
Rail transport systems and their characteristics; Railway vehicles and characteristics; Equation of train?s motion and applications; Route layout; Zero line; Plan and profile; Geometric characteristics of railway lines; Grades; Curves; Super elevation and transition curve; Clearance and types of cross section; Cross section and volume calculations; Mass diagrams; Earthwork balance according to General and Bruckner Method; Superstructure of railways; Rails; Sleepers; Connecting elements and ballast layer; Railways line capacity.

İNŞ 454 Earthquake Analysis of Structures 3+0 4,5
Earthquakes, Seismic waves; Measurement of ground motion; The concept of the earthquake zone; Earthquake magnitude and seismic energy; Richter scale; Vibration measuring instruments; Single degree of freedom systems; Multi-degree of freedom systems, earthquake motion; Strong ground motion; Identification and obtaining earthquake spectra. Design of structures against earthquakes; Design principles; Turkish Earthquake Regulation for the seismic analysis of structures.

İNŞ 454 Earthquake Analysis of Structures 3+0 4,5
Earthquakes, Seismic waves; Measurement of ground motion; The concept of the earthquake zone; Earthquake magnitude and seismic energy; Richter scale; Vibration measuring instruments; Single degree of freedom systems; Multi-degree of freedom systems, earthquake motion; Strong ground motion; Identification and obtaining earthquake spectra. Design of structures against earthquakes; Design principles; Turkish Earthquake Regulation for the seismic analysis of structures.

İNŞ 455 Highway Design 2+2 4,5
Introduction to Highway Design; Highway Systems; Characteristics of Vehicles and Drivers; Characteristics of Traffic; Geometric Characteristics of Highways: Route choice, Sight distance criterion, Zero line application, Compound and reverse curves, Horizontal alignment, Transition length and superelevation, Vertical alignment, Climbing lanes; Cross Section Elements; Cross Section and Volume Calculations; Mass Diagram; Cost of Hauling; Types of Pavements; Material Characteristics; Pavement Thickness Designation: AASHTO design method, Other pavement design approaches; Properties of Asphaltic Concrete; Retaining Walls; Surface and Subsurface Drainage; Culvert design.

İNŞ 455 Highway Design 2+2 4,5
Introduction to Highway Design; Highway Systems; Characteristics of Vehicles and Drivers; Characteristics of Traffic; Geometric Characteristics of Highways: Route choice, Sight distance criterion, Zero line application, Compound and reverse curves, Horizontal alignment, Transition length and superelevation, Vertical alignment, Climbing lanes; Cross Section Elements; Cross Section and Volume Calculations; Mass Diagram; Cost of Hauling; Types of Pavements; Material Characteristics; Pavement Thickness Designation: AASHTO design method, Other pavement design approaches; Properties of Asphaltic Concrete; Retaining Walls; Surface and Subsurface Drainage; Culvert design.

İNŞ 456 Ground Water Hydrology 3+0 4,5
Introduction: Groundwater and hydrologic cycle, Groundwater as a resource, Groundwater contamination, Groundwater and geologic processes; Physical Properties

and Principles: Darcy?s law, Hydraulic head, Hydraulic conductivity, Porosity, Aquifers, Equations of groundwater flow, Hydrodynamic dispersion; Groundwater and Hydrologic Cycle: Steady-state groundwater flow, Steady-state hydrologic budgets, Transient groundwater flow, Infiltration and groundwater recharge. Groundwater Resource Evaluation: Development of groundwater resource, Pumping tests, Basin yield, Seawater intrusion. Groundwater contamination: Water quality standards, Transport processes, Hydrochemical behavior of contaminants, Measurement of parameters, Source of contamination

İNŞ 456 Ground Water Hydrology 3+0 4,5
Introduction: Groundwater and hydrologic cycle, Groundwater as a resource, Groundwater contamination, Groundwater and geologic processes; Physical Properties and Principles: Darcy?s law, Hydraulic head, Hydraulic conductivity, Porosity, Aquifers, Equations of groundwater flow, Hydrodynamic dispersion; Groundwater and Hydrologic Cycle: Steady-state groundwater flow, Steady-state hydrologic budgets, Transient groundwater flow, Infiltration and groundwater recharge. Groundwater Resource Evaluation: Development of groundwater resource, Pumping tests, Basin yield, Seawater intrusion. Groundwater contamination: Water quality standards, Transport processes, Hydrochemical behavior of contaminants, Measurement of parameters, Source of contamination

İNŞ 457 Construction Cost Design 2+2 4,5
Drawings and Specifications; Drawings Reading and Analysis; Quantity Take-Off; Master Format; Unit Price and Work Breakdown Structure; Approximate Estimate; Final Estimate; Bidding Procedures; Risk Applications; Value Engineering; Unit Price Analysis; Electronic Cost Calculation Program; Web-Based Cost Calculation; Approximate Cost Applications; Cost Elements for Construction Projects; Project Delivery Methods and Bidding Processes.

İNŞ 457 Construction Cost Design 2+2 4,5
Drawings and Specifications; Drawings Reading and Analysis; Quantity Take-Off; Master Format; Unit Price and Work Breakdown Structure; Approximate Estimate; Final Estimate; Bidding Procedures; Risk Applications; Value Engineering; Unit Price Analysis; Electronic Cost Calculation Program; Web-Based Cost Calculation; Approximate Cost Applications; Cost Elements for Construction Projects; Project Delivery Methods and Bidding Processes.

İNŞ 458 Testing of Concrete 3+0 4,5
Introduction, quality control of concrete structures; types of tests applied on concrete; strength of concrete, standard testing, preparation of test samples; semi-destructive tests; pull-out tests, pull-off tests; non-destructive tests; rebound hammer test; ultrasonic pulse velocity test; radar imaging of concrete, x-ray diffraction on concrete materials; porosity by mercury intrusion porosimetry; differential scanning calorimetry tests on concrete; maturity of concrete, estimation of concrete strength by combined methods; Project presentations.

İNŞ 458 Testing of Concrete 3+0 4,5
Introduction, quality control of concrete structures; types of tests applied on concrete; strength of concrete, standard testing, preparation of test samples; semi-destructive tests; pull-out tests, pull-off tests; non-destructive tests; rebound hammer test; ultrasonic pulse velocity test; radar imaging of concrete, x-ray diffraction on concrete materials; porosity by mercury intrusion porosimetry; differential scanning calorimetry tests on concrete; maturity of concrete, estimation of concrete strength by combined methods; Project presentations.

İNŞ 459 Geotechnical Design 2+2 4,5
An Overview of Geotechnical Problems: In-situ and Laboratory experiments for geotechnical problems, Analysis of laboratory and in-situ experiments; Retaining Wall Projects; Sheet Pile Projects; Braced Cut Projects; Slope Stability Analysis; Shallow Foundation Projects: Single foundation projects, Combined foundation projects, Mat foundation projects; Deep foundation; Pier and caisson foundation projects; Pile foundation projects; Soil Improvemenet Projects; Reinforced Earth Projects.

İNŞ 459 Geotechnical Design 2+2 4,5
An Overview of Geotechnical Problems: In-situ and Laboratory experiments for geotechnical problems, Analysis of laboratory and in-situ experiments; Retaining Wall Projects; Sheet Pile Projects; Braced Cut Projects; Slope Stability Analysis; Shallow Foundation Projects: Single foundation projects, Combined foundation projects, Mat foundation projects; Deep foundation; Pier and caisson foundation projects; Pile foundation projects; Soil Improvemenet Projects; Reinforced Earth Projects.

İNŞ 460 Admixture for Concrete 3+0 4,5
Introduction, concrete properties and use of admixtures; benefits of concrete admixtures; types of admixtures; air entraining admixtures, water reducing admixtures, superplasticizers; set controlling admixtures; accelerating and retarding admixtures; mineral admixtures; pozzolans, natural pozzolans, artificial pozzolans; fly ashes, silica fumes, trass, ground granulated blast furnace slags; special types of admixtures; corrosion inhibiting admixtures, permeability reducing admixtures, coloring admixtures; Project presentations.

İNŞ 460 Admixture for Concrete 3+0 4,5
Introduction, concrete properties and use of admixtures; benefits of concrete admixtures; types of admixtures; air entraining admixtures, water reducing admixtures, superplasticizers; set controlling admixtures; accelerating and retarding admixtures; mineral admixtures; pozzolans, natural pozzolans, artificial pozzolans; fly ashes, silica fumes, trass, ground granulated blast furnace slags; special types of admixtures; corrosion inhibiting admixtures,

permeability reducing admixtures, coloring admixtures; Project presentations.

İNŞ 461 Structural Design for Reinforced Concrete Buildings 2+2 4,5

Factors Affecting the Choice of Concrete as the Structural Material; Structural Safety; Load Combinations and Limit States; Concrete: Concrete class and mixture proportions, Performance based concrete production; National and International Codes; Preliminary Design and Structural Carrying System; Behavior of Reinforced Concrete Structures under Earthquake Loads; Internal Force Diagrams and Use of Computer Packages, Design of Structural Members: Slab Systems, Columns, beams, Shear Walls, Stairs; Interpretation of Soil Properties and Selection of Appropriate Foundation Systems and Foundation Designs; Structural Drawings and Details.

İNŞ 461 Structural Design for Reinforced Concrete Buildings 2+2 4,5

Factors Affecting the Choice of Concrete as the Structural Material; Structural Safety; Load Combinations and Limit States; Concrete: Concrete class and mixture proportions, Performance based concrete production; National and International Codes; Preliminary Design and Structural Carrying System; Behavior of Reinforced Concrete Structures under Earthquake Loads; Internal Force Diagrams and Use of Computer Packages, Design of Structural Members: Slab Systems, Columns, beams, Shear Walls, Stairs; Interpretation of Soil Properties and Selection of Appropriate Foundation Systems and Foundation Designs; Structural Drawings and Details.

İNŞ 462 Properties of Fresh and Hardened Concrete 3+0 4,5

Introduction, concrete making principles; properties of fresh concrete; workability, pumpability, placing, compacting, bleeding, segregation, setting of concrete, curing of concrete; properties of hardened concrete; strength of concrete, nature of strength of concrete, microcracking, aggregate-cement paste interface, maturity of concrete; effect of age on strength of concrete, durability of concrete, shrinkage of concrete, creep of concrete; Project presentations.

İNŞ 462 Properties of Fresh and Hardened Concrete 3+0 4,5

Introduction, concrete making principles; properties of fresh concrete; workability, pumpability, placing, compacting, bleeding, segregation, setting of concrete, curing of concrete; properties of hardened concrete; strength of concrete, nature of strength of concrete, microcracking, aggregate-cement paste interface, maturity of concrete; effect of age on strength of concrete, durability of concrete, shrinkage of concrete, creep of concrete; Project presentations.

İNŞ 463 Hydraulic Design 2+2 4,5

Introduction to the Design of Hydraulic Structures for the Storage and Conveyance of Water: Canals, Culverts, Weirs, Spillways, Water Distribution Networks; Basic Principles of Hydrology, Fluid Mechanics, Hydraulics; Closed Conduits and Open Channel Flows; Hydraulics of Rivers, Waterways, Man-made Structures; Introduction to Professional Design of Hydraulic Structures; Emphasis on Teamwork, Project Documentation, Oral Presentations.

İNŞ 463 Hydraulic Design 2+2 4,5

Introduction to the Design of Hydraulic Structures for the Storage and Conveyance of Water: Canals, Culverts, Weirs, Spillways, Water Distribution Networks; Basic Principles of Hydrology, Fluid Mechanics, Hydraulics; Closed Conduits and Open Channel Flows; Hydraulics of Rivers, Waterways, Man-made Structures; Introduction to Professional Design of Hydraulic Structures; Emphasis on Teamwork, Project Documentation, Oral Presentations.

İNŞ 464 Concrete Durability 3+0 4,5

Introduction, causes of destruction of concrete; transport of agents in concrete; pore system, absorption, permeability of concrete; sulfate attack on concrete; mechanism of attack; acid attack on concrete; mechanism of attack; effect of sea water on concrete; corrosion of reinforcement; abrasion of concrete; freezing and thawing; action of frost; effect of elevated temperatures on concrete, fire resistance of concrete; Project presentations.

İNŞ 464 Concrete Durability 3+0 4,5

Introduction, causes of destruction of concrete; transport of agents in concrete; pore system, absorption, permeability of concrete; sulfate attack on concrete; mechanism of attack; acid attack on concrete; mechanism of attack; effect of sea water on concrete; corrosion of reinforcement; abrasion of concrete; freezing and thawing; action of frost; effect of elevated temperatures on concrete, fire resistance of concrete; Project presentations.

İNŞ 465 Steel Structural Design 2+2 4,5

History; Material; Loads on Industrial Buildings; Static Systems of Steel Industrial Buildings; Industrial Buildings with Single and Multiple Span; Special Industrial Buildings; Aeroplane Hangars; Cable Systems; Static System Properties of Tall Buildings; Investigation of Economic Structural Systems; Loads on Tall Buildings; System and Member Stability; Rigidity of Tall Buildings and Limits of Lateral Displacements; Special Beams Used in Tall Buildings.

İNŞ 465 Steel Structural Design 2+2 4,5

History; Material; Loads on Industrial Buildings; Static Systems of Steel Industrial Buildings; Industrial Buildings with Single and Multiple Span; Special Industrial Buildings; Aeroplane Hangars; Cable Systems; Static System Properties of Tall Buildings; Investigation of Economic Structural Systems; Loads on Tall Buildings; System and Member Stability; Rigidity of Tall Buildings and Limits of Lateral Displacements; Special Beams Used in Tall Buildings.

İNŞ 466 Stell Structure Project 3+0 4,5

Selection of the system; Determination of loads; Studying related codes; Design of purlin; Determination of loads acting on truss; Solution of truss under dead load, snow and wind load; Design of truss members; Weld calculations of

truss; Design of columns and horizontal members; Foundation calculation; Drawings.

İNŞ 467 Construction Equipments 3+0 4,5
Basic concepts about construction equipments; Reasons to use construction equipments; Use and maintenance of construction equipments; Selection of equipments in construction projects; Construction equipments management; Organization of construction equipments; Cost of operating construction equipments; Safety in construction equipments; Construction equipment accidents; Safety requirements for construction equipment.

İNŞ 468 Computer-Based Project Management 3+0 4,5
Introduction to planning; Types and resaonso of planning; Project Planning and control using computer; Project communication using computer; Computer-Based resource-cost planning; Relations between activities; Risk factors in planning; Short-Middle-Long term planning.

İNŞ 468 Computer-Based Project Management 3+0 4,5
Introduction to planning; Types and resaonso of planning; Project Planning and control using computer; Project communication using computer; Computer-Based resource-cost planning; Relations between activities; Risk factors in planning; Short-Middle-Long term planning.

İNŞ 469 Renewable Energy with Water, Wind and Wave Power 3+0 4,5
Introduction to renewable energy; Energy consumption, recent data; Global energy crisis; Energy production: introduction to renewable energy resources, hydropower, energy from wind power, energy from wave power; new energy production methods; Cost of energy generation; Global and Turkish renewable energy policies, Energy related investments in Turkey.

İNŞ 470 Concrete Technology 3+0 4,5
Ordinary Concrete Technology; New Developing Concrete Materials; Additive Materials; Quality Assurance and Quality Control; Special Production Technologies; Concrete Pouring in Extreme Weather Conditions (Hot and Cold Weather); Ready Mixed Concrete; Pump Concrete; Shotcrete; Injection Mortar; Vacuum Concrete; Concrete Under Water; Heat Treatment Application in Prefabrication; Massive Concrete and Roller Compacted Concrete; Light Weight Concrete; Highway and Airport Concrete.

İNŞ 470 Concrete Technology 3+0 4,5
Ordinary Concrete Technology; New Developing Concrete Materials; Additive Materials; Quality Assurance and Quality Control; Special Production Technologies; Concrete Pouring in Extreme Weather Conditions (Hot and Cold Weather); Ready Mixed Concrete; Pump Concrete; Shotcrete; Injection Mortar; Vacuum Concrete; Concrete Under Water; Heat Treatment Application in Prefabrication; Massive Concrete and Roller Compacted Concrete; Light Weight Concrete; Highway and Airport Concrete.

İNŞ 471 Numerical Modeling in Hydrology and Hydraulics 2+2 4,5
Programming with QuickBASIC: QuickBASIC compiler, Reading and writing data, Dimensional variables, Loops, Conditional statements; Monthly Dam Reservoir Budget Calculation; Calculating Normal and Critical Depths in Open Channels by Using Numerical Methods; Correcting the Inhomogeneous Records of a Hydrological Station; Filling the Missing Data of a Hydrological Station by Regression; Calculating the Water Surface Profiles in Open Channels by Using Numerical Methods: Cross section changes, Gradually varied flow; Flood Routing in Open Channels: Muskingum approach, Saint-Venant equation approach.

İNŞ 472 Introduction to Traffic 3+0 4,5
Introduction to Traffic Engineering; Traffic Flow Characteristics; Characteristics of Traffic; Fundamental Models of Traffic Flow; Statistical Aspects of Traffic Flow; Traffic Study and Evaluation; Count and Observation Techniques; Inquiry and Forecast Techniques: Intersections, Design Characteristics of İntersections; Capacity / performance Analysis, Signalized Inter-sections, Traffic Signs and Signing, Traffic Safety.

İNŞ 472 Introduction Traffic Engineering 3+0 4,5
Introduction to Traffic Engineering; Traffic Flow Characteristics; Characteristics of Traffic; Fundamental Models of Traffic Flow; Statistical Aspects of Traffic Flow; Traffic Study and Evaluation; Count and Observation Techniques; Inquiry and Forecast Techniques: Intersections, Design Characteristics of İntersections; Capacity / performance Analysis, Signalized Inter-sections, Traffic Signs and Signing, Traffic Safety.

İNŞ 473 Tımber Structures 3+0 4,5
Introduction: Brief history, advantages and disadvantages; Characteristics and Classifications of Wood: Density, Material defects, Moisture content; Unit Stresses; Working Stresses for Structural Members; Properties of Sections; Bending Moments and Shear: Shearing stress in beams; Compression Perpendicular to Grain; Deflection of Beams; Design of Timber Connections: Joint slip, Effective cross-section, Spacing rules, Nailed joints, Screwed joints, Bolted and dowelled joints, Connected joints, Glued joints; Design of Flexural Members: Bending stress and prevention of lateral buckling, Deflection, Bearing stress, Shear stress; Design of Axially Loaded Members: Design of compression members, Slenderness ratio; Wind effect.

İNŞ 474 Tunnels 3+0 4,5
Substructures; Stability of Substructure Body: Preventing Slides; Types of Protection Construction: Retaining Walls, Cover Walls, Gutters, Ripraps, Snow Fences, Substructure for Passing Rivers, Culverts, Tunnels: Definition and History, Tunnel Investigations, Pressures on Tunnels, Cover Dimension and Forms, Galleries, Shafts, Methods of Tunnel Construction, Special Tunneling Methods.

İNŞ 474 Tunnels 3+0 4,5
Substructures; Stability of Substructure Body: Preventing Slides; Types of Protection Construction: Retaining Walls, Cover Walls, Gutters, Ripraps, Snow Fences, Substructure for Passing Rivers, Culverts, Tunnels: Definition and History, Tunnel Investigations, Pressures on Tunnels, Cover Dimension and Forms, Galleries, Shafts, Methods of Tunnel Construction, Special Tunneling Methods.

İNŞ 475 Multi-Story Steel Structure Design 3+0 4,5
Introduction: Definition of a tall building, Lateral load design philosophy, Concept of premium for height; Wind Effects: Design considerations, Extreme wind conditions, Code wind loads; Seismic Design: Tall building behavior during earthquakes, Philosophy of earthquake design, Dynamic approach; Steel Buildings: Introduction, Semi-rigid frames, Rigid frames, Braced frames, Eccentric bracing systems, Framed tube systems, Trussed framed systems.

İNŞ 476 Project Planning with Primavera and MS Project 3+0 4,5
Introduction to Primavera; Reasons of using Primavera, its advantages, disadvantages; Dividing the project; Special data sections; Dviding cost calculations; Resource balancing; Managing more than one project; Late times and free float calculations; Defining activities; Relations between activities in Primavera; Resource and budget planning with Primavera.

İNŞ 476 Project Planning with Primavera and MS Project 3+0 4,5
Introduction to Primavera; Reasons of using Primavera, its advantages, disadvantages; Dividing the project; Special data sections; Dviding cost calculations; Resource balancing; Managing more than one project; Late times and free float calculations; Defining activities; Relations between activities in Primavera; Resource and budget planning with Primavera.

İNŞ 478 Construction Cost Analysis and Estimating 3+0 4,5
Introduction to Construction Cost; Definition of Cost Analysis; Bidding Law; Bidding Qualification; Optimum Proposal Preparation; Bid Bond; Performance Bond; Final Cost; Project Acceptance; Blue-Print Reading; Material Resources; Total Project Cost.

İNŞ 478 Construction Cost Analysis And Estimating 3+0 4,5
Introduction to Construction Cost; Definition of Cost Analysis; Bidding Law; Bidding Qualification; Optimum Proposal Preparation; Bid Bond; Performance Bond; Final Cost; Project Acceptance; Blue-Print Reading; Material Resources; Total Project Cost.

İNŞ 480 Concrete Making Materials 3+0 4,5
Introduction, concrete making, concrete casting; cements; types of cements, manufacture of cementitious materials; Portland cement, properties of Portland cement, tests on properties of Portland cement; pozzolanic materials; types of pozzolanic materials, artificial and natural pozzolans; effects of pozzolans on properties of fresh and hardened concrete; aggregates; types of aggregate, properties of aggregate; effects of aggregate type and properties on concrete properties; water; mixing water, properties of mixing water; admixtures; classification of admixtures, purpose of use of admixtures in concrete; Project presentations.

İNŞ 480 Concrete Making Materials 3+0 4,5
Introduction, concrete making, concrete casting; cements; types of cements, manufacture of cementitious materials; Portland cement, properties of Portland cement, tests on properties of Portland cement; pozzolanic materials; types of pozzolanic materials, artificial and natural pozzolans; effects of pozzolans on properties of fresh and hardened concrete; aggregates; types of aggregate, properties of aggregate; effects of aggregate type and properties on concrete properties; water; mixing water, properties of mixing water; admixtures; classification of admixtures, purpose of use of admixtures in concrete; Project presentations.

İNŞ 481 Soil Mechanics II 3+0 4,5
Shear Strength of Soil, Bearing Capacity of Shallow Foundations; Stress Distribution in Soil; Consolidation Theory: Finding Coefficient of Consolidation with Square-root-of time and logarithm-of-time; Drained and Undrained Loading in Soil; Computing of Settlement for Load Conditions; Settlement Boundaries for Structures; Calculations of Earth Pressure, Retaining Walls, Slope Stability.

İNŞ 481 Soil Mechanics II 3+0 4,5
Shear Strength of Soil, Bearing Capacity of Shallow Foundations; Stress Distribution in Soil; Consolidation Theory: Finding Coefficient of Consolidation with Square-root-of time and logarithm-of-time; Drained and Undrained Loading in Soil; Computing of Settlement for Load Conditions; Settlement Boundaries for Structures; Calculations of Earth Pressure, Retaining Walls, Slope Stability.

İNŞ 482 Ground Improvement 3+0 4,5
Preloading; Vertical Drains; Deep Compaction of Cohesion less Soils: Vibrofloatation, Vibratory probes, Compaction piles, Dynamic compaction, Blasting; Grouting: Permeating grouting, Compaction grouting; Chemical grouting. Jet grouting; Soil Reinforcement: Soil nailing, Micro piles, Reinforced earth, Stone columns, Lime columns, Geotextiles, Freezing, Electro-osmosis.

İNŞ 482 Ground Improvement 3+0 4,5
Preloading; Vertical Drains; Deep Compaction of Cohesion less Soils: Vibrofloatation, Vibratory probes, Compaction piles, Dynamic compaction, Blasting; Grouting: Permeating grouting, Compaction grouting; Chemical grouting. Jet grouting; Soil Reinforcement: Soil nailing, Micro piles, Reinforced earth, Stone columns, Lime columns, Geotextiles, Freezing, Electro-osmosis.

İNŞ 483 Retaining Structures 3+0 4,5
Highway and Railway Fills; Earth Dams; General Principles of Design; Choice of Dam Type. Circular arc Method of Stability Analysis; Prediction of Pore Pressures During Construction: Steady Seepage and Rapid Draw Down; Special Methods of Analysis for Puddle Core and Rock Fill Dams; Design in Earthquake Areas.

İNŞ 483 Retaining Structures 3+0 4,5
Highway and Railway Fills; Earth Dams; General Principles of Design; Choice of Dam Type. Circular arc Method of Stability Analysis; Prediction of Pore Pressures During Construction: Steady Seepage and Rapid Draw Down; Special Methods of Analysis for Puddle Core and Rock Fill Dams; Design in Earthquake Areas.

İNŞ 484 Foundation Engineering II 3+0 4,5
Protection of Used Materials in Foundation Construction: Ground improvement, Protection of foundation hole against underground water and surface water, Cofferdams; Keeping Dry of Foundation Hole; Insitu Experiments and Evaluation; Calculations of Shallow Foundations; Methods of Rigid and Flexible Computation; Single. Strip and Mat foundations; Deep foundation: Group piles, Calculation of piles according to horizontal loads; Specific Foundations.

İNŞ 484 Foundation Engineering II 3+0 4,5
Protection of Used Materials in Foundation Construction: Ground improvement, Protection of foundation hole against underground water and surface water, Cofferdams; Keeping Dry of Foundation Hole; Insitu Experiments and Evaluation; Calculations of Shallow Foundations; Methods of Rigid and Flexible Computation; Single. Strip and Mat foundations; Deep foundation: Group piles, Calculation of piles according to horizontal loads; Specific Foundations.

İNŞ 485 Irrigation and Drainage 3+0 4,5
Introduction; Properties of Soil and Water; Irrigation Systems: Element of classical water intake networks, Element of classical water discharge network, Computation of discharge network; Water Distribution Methods and System Design; Hydrology and Computation of Channel; Theoretical Bases of Drainage; Drainage with Trenches; Design of Trench Networks.

İNŞ 485 Irrigation and Drainage 3+0 4,5
Introduction; Properties of Soil and Water; Irrigation Systems: Element of classical water intake networks, Element of classical water discharge network, Computation of discharge network; Water Distribution Methods and System Design; Hydrology and Computation of Channel; Theoretical Bases of Drainage; Drainage with Trenches; Design of Trench Networks.

İNŞ 486 Introduction to Soil Dynamics 3+0 4,5
Fundamentals of Vibration; Earthquakes and Ground Vibrations; Shear Modulus and Damping in Soils; Response of Soil Layers to Earthquake Motions; Lateral Earth Pressure on Retaining Walls; Theories Connected with Active Earth Pressure; Liquefaction of Soils; Stability of Slopes and Dams Under Seismic Loads; Dynamic Bearing Capacity and Settlement of Foundations.

İNŞ 486 Introduction to Soil Dynamics 3+0 4,5
Fundamentals of Vibration; Earthquakes and Ground Vibrations; Shear Modulus and Damping in Soils; Response of Soil Layers to Earthquake Motions; Lateral Earth Pressure on Retaining Walls; Theories Connected with Active Earth Pressure; Liquefaction of Soils; Stability of Slopes and Dams Under Seismic Loads; Dynamic Bearing Capacity and Settlement of Foundations.

İNŞ 487 Water Structures 3+0 4,5
Introduction; Developing Water Resources and Contribution to Economy, River Morphology, Sediment Motion in Rivers, River Regulation. Flood Control: Preventing structures; Transportation onRiver and Types of Transportations: Diversions, Dams and reservoirs; Structures of Energy Dissipaters; Intake Structures; Hydroelectric Power; Irrigation-Drainage; Theoretic Fundamentals; Economic Analysis of Water Resources.

İNŞ 487 Water Structures 3+0 4,5
Introduction; Developing Water Resources and Contribution to Economy, River Morphology, Sediment Motion in Rivers, River Regulation. Flood Control: Preventing structures; Transportation onRiver and Types of Transportations: Diversions, Dams and reservoirs; Structures of Energy Dissipaters; Intake Structures; Hydroelectric Power; Irrigation-Drainage; Theoretic Fundamentals; Economic Analysis of Water Resources.

İNŞ 488 Environmental Geotechnology 3+0 4,5
Environmental Cycle; Solid Waste Groups; Soil Formation; Constituents and Properties; Waste-Soil Interaction; Waste Dumping; Physico-Chemical Properties of Soil: Cation exchange capacity, Specific surface area, Ph, Electrical conductivity, Organic matter content, Zeta potential, Dielectric constant, Double layer theories, Heavy metal, Salt and hydrocarbon pollution in soil; Micro-Structure Properties of Soil: Scanning electron microscopy, X-Ray analysis; Improvement of Polluted Soil: Stabilization/Solidification Methods: Fly ash, lime, cement and asphalt stabilization, Sanitary landfill design.

İNŞ 488 Environmental Geotechnology 3+0 4,5
Environmental Cycle; Solid Waste Groups; Soil Formation; Constituents and Properties; Waste-Soil Interaction; Waste Dumping; Physico-Chemical Properties of Soil: Cation exchange capacity, Specific surface area, Ph, Electrical conductivity, Organic matter content, Zeta potential, Dielectric constant, Double layer theories, Heavy metal, Salt and hydrocarbon pollution in soil; Micro-Structure Properties of Soil: Scanning electron microscopy, X-Ray analysis; Improvement of Polluted Soil: Stabilization/Solidification Methods: Fly ash, lime, cement and asphalt stabilization, Sanitary landfill design.

İNŞ 489 Open Channel Hydraulics 3+0 4,5
General Equation of Gradually Varied Flows (GVF); Types of Channel Slopes; Characteristics and Classification of GVF Profiles; Solution of GVF Equations; Characteristics of Rapidly Varied Flow; Flow Over Spillways; Crest Shape and Discharge of Overflow Spillways; Basic Characteristics of Jump; Flow Measurement in Open Channel; Types of Flow Measurement Structures; Sharp, Short and Broad Crested Weirs.

İNŞ 490 Coastal and Port Engineering 3+0 4,5
İntroduction to Coastal and Port Engineering; Sea Waves; Methods of Wave Prediction; Variation of Waves in Coastal Area; Wave Energy and Wave Force; Coastal Currents; Motion of Coastal Sediments Transport; Effect of Sea Water to Coastal Structure Materials; Protective Coastal Structure; Properties of Ports and General Design Principles; Unit System in Port; Breakwaters: Types of structure, project and Principles of calculations; Quay and Jetties.

İNŞ 490 Coastal and Port Engineering 3+0 4,5
İntroduction to Coastal and Port Engineering; Sea Waves; Methods of Wave Prediction; Variation of Waves in Coastal Area; Wave Energy and Wave Force; Coastal Currents; Motion of Coastal Sediments Transport; Effect of Sea Water to Coastal Structure Materials; Protective Coastal Structure; Properties of Ports and General Design Principles; Unit System in Port; Breakwaters: Types of structure, project and Principles of calculations; Quay and Jetties.

İNŞ 492 Water Resources Engineering 3+0 4,5
Classification of Dams: Types of spillways, Crest gates, Outlet works; Uses, Quantities, Characteristics and quality of water; Treatment and Distribution System; Characteristics; Collection, Treatment and Management of Wastewater; Soil-Water Relationships; Irrigation Methods; Drainage Flow and Land Drainage; Municipal Storm and Highway Drainage; Culverts and Bridge Waterways; Hydroelectric Power Plants; Turbines; Operation, Planning.

İNŞ 492 Water Resources Engineering 3+0 4,5
Classification of Dams: Types of spillways, Crest gates, Outlet works; Uses, Quantities, Characteristics and quality of water; Treatment and Distribution System; Characteristics; Collection, Treatment and Management of Wastewater; Soil-Water Relationships; Irrigation Methods; Drainage Flow and Land Drainage; Municipal Storm and Highway Drainage; Culverts and Bridge Waterways; Hydroelectric Power Plants; Turbines; Operation, Planning.

İNŞ 494 Civil Engineering Construction 3+0 4,5
Fundamental Principles for System; Introduction and Selection and Introduction to Analytic Operation; Mathematical Optimised Theory in Engineering Issue and Systematic Investigation of Applications; Solution Development of Single and Multi-purposes Problems; Usage Theory; Statistical Decision-support System; Uncertainty and Risk analysis; Design for Uncertainty and Failure.

İNŞ 494 Construction in Civil Engineering 3+0 4,5
Fundamental Principles for System; Introduction and Selection and Introduction to Analytic Operation; Mathematical Optimised Theory in Engineering Issue and Systematic Investigation of Applications; Solution Development of Single and Multi-purposes Problems; Usage Theory; Statistical Decision-support System; Uncertainty and Risk analysis; Design for Uncertainty and Failure.

İNŞ 495 Highway Pavements 3+0 4,5
Definition of Highway Pavement and Introduction; Stresses in Flexible Pavements: Traffic load, Design of highway pavements; Flexible Pavements: Design methods and laboratory tests; Rigid Pavement: Design methods, Properties of pavement components; Properties of Aggregates and Bituminous; Quality Control Test of Materials; Flexible, Asphalt and Concrete Pavement Construction.

İNŞ 495 Highway Pavements 3+0 4,5
Definition of Highway Pavement and Introduction; Stresses in Flexible Pavements: Traffic load, Design of highway pavements; Flexible Pavements: Design methods and laboratory tests; Rigid Pavement: Design methods, Properties of pavement components; Properties of Aggregates and Bituminous; Quality Control Test of Materials; Flexible, Asphalt and Concrete Pavement Construction.

İNŞ 496 Construction Planning and Management 3+0 4,5
Project Management and Organisation: Application-organisation of construction management; Construction Engineering and Marketing Applications; Long-Short Fixed Term Strategic Marketing Planning; Using Financial Sources in Civil Engineering; International Construction Market; Communication and Concepts of Sales Marketing.

İNŞ 498 Introduction to Structural Dynamics 3+0 4,5
Introduction; Reasons and Preventives of Dynamic Disturbance; Single and Multiple Degree of Freedom Systems; Continuous Systems; Motion Equations; Theoretical Explanations and Solutions; Energy Methods in Structural Dynamics; Applications in Structural Dynamics; Areas of Structural Dynamics; Earthquake Engineering; Project against Explosion; Random Vibrations; Reactions of Structures against Earthquake; Preventives; Estimations and Criteria of Damage Determination.

İSG 401 Occupational Health and Safety I 2+0 2,0
Overview of Occupational Health and Safety: Scope, Importance, Related concepts; Workplace Accidents and Occupational Diseases: Reasons, Precautions, Costs; Occupational Health and Safety: Responsible institutions, Problems in applications, Legal basis for occupational safety, Legislation, Regulations for employers; Legal Responsibility of Employers for Workplace Accidents and Occupational Diseases: Liability concept, Regulations for employer responsibility.

İSG 402 Occupational Health and Safety II 2+0 2,0
Compensation Claims for Occupational Health and Safety: Compensation types; Legislation for Employers not Abide by Occupational Health and Safety Instructions: Administrative sanctions, Criminal sanctions, Investigations for workplace accidents; Organization in Workplace for Occupational Health and Safety: Employee representative, Obligation for constituting board for occupational health and safety, Workplace health and safety board; International Legislation for Occupational Health and Safety: International legislation, European legislation, Comparison of national and international legislation.

İSN 309 Mass Media 3+0 3,0
Concept of the Mass Media; Emergence of Mass Media; Historical Development of Mass Media Research; Liberal and Critical Approaches to Mass Media; Optimistic Approach to Mass Media: Marshall McLuhan; Pessimistic Approach to Mass Media: Herbert Marcuse; Quasi Optimistic Approach to Mass Media: Alvin Toffler; Ideological Function of Mass Media; Globalization and Consumer Society; Advertising and Consumer Society; News and Reality; Myth Production in Mass Media: Advertising, TV, News; Discussions on Information Society: Internet and the Problem of Participation; Media and Women; Media and Democracy.

İSN 309 Mass Media 3+0 3,0
Concept of the Mass Media; Emergence of Mass Media; Historical Development of Mass Media Research; Liberal and Critical Approaches to Mass Media; Optimistic Approach to Mass Media: Marshall McLuhan; Pessimistic Approach to Mass Media: Herbert Marcuse; Quasi Optimistic Approach to Mass Media: Alvin Toffler; Ideological Function of Mass Media; Globalization and Consumer Society; Advertising and Consumer Society; News and Reality; Myth Production in Mass Media: Advertising, TV, News; Discussions on Information Society: Internet and the Problem of Participation; Media and Women; Media and Democracy.

İSP 151 Spanish I 4+0 4,0
Introduction: Greeting, Giving information; Gender in Nouns and Adjectives; Verbs in the Present Tense; Demonstrative Adjectives and Pronouns; Plural Forms of Nouns and Adjectives; Description: House, Objects, Numbers; Asking Questions; Asking for Directions and the Time; Verbs in the Present Progressive Tense; At a Restaurant: Ordering, Asking for the Bill, Talking about Preferences; Describing People; Reflexive Verbs; Shopping: Cost, Likes and Dislikes, Quantity; Invitation: Accepting, Refusing; Gerunds; Seasons.

İSP 152 Spanish II 4+0 4,0
The Past: Near and remote past, Prepositions, Indefinite pronouns; The Future: Future plans, Making a phone call, Comparison; The Future Perfect Tense; Habits in the Past; Regular and Irregular Verbs; Senses; Some Grammar Rules: Obligation, Personal pronouns, Passive construction, conjunctions; Reading Texts: Biography, Narration, Picture stories.

İST 201 Statistics 3+0 3,0
Definition of Statistics: Data collection; Data Presentation Techniques, Distribution theory; Sampling: Errors, Estimation of population parameters; Hypothesis Testing: Hypothesis testing for two populations, Comparisons of ratios, Hypothesis testing for large and small samples; The Chi-Square Distribution and Chi-Square Testing; Correlation: Simple linear correlation coefficient, Regression coefficient, Forecasting, Determination coefficient.

İST 201 Statistics 3+0 3,0
Definition of Statistics: Data collection; Data Presentation Techniques, Distribution theory; Sampling: Errors, Estimation of population parameters; Hypothesis Testing: Hypothesis testing for two populations, Comparisons of ratios, Hypothesis testing for large and small samples; The Chi-Square Distribution and Chi-Square Testing; Correlation: Simple linear correlation coefficient, Regression coefficient, Forecasting, Determination coefficient.

İST 244 Engineering Probability 3+0 5,0
Combinatorial Analysis: Permutations, Combinations; Axioms of Probability: Sample Space and Events; Conditional Probability and Independence: Bayes' Formula, Independent Events; Discrete Random Variables: Expected Value, Variance, the Bernoulli and the Binomial Random Variables, the Poisson Random Variable, the Geometric Random Variables, Properties of the Cumulative Distribution Function; Continuous Random Variables: the Uniform Random Variable, Normal Random Variables, the Normal Approximation to the Binomial Distribution, Exponential Random Variables; Jointly Distributed Random Variables: Independent Random Variables, Sums of Independent Random Variables, Order Statistics; Conditional Expectation: Computing Probabilities by Conditioning, Conditional Variance; Conditional Expectation and Prediction; Moment Generating Functions; the Chebyshev's Inequality and the Weak Law of Large Numbers; the Central Limit Theorem; the Strong Law of Large Numbers; Other Inequalities: the One-sided Chebyshev Inequality, the Chernoff Bounds, the Jensen's Inequality; the Poisson Process; Markov Chains.

İST 244 Engineering Probability 3+0 5,0
Combinatorial Analysis: Permutations, Combinations; Axioms of Probability: Sample Space and Events; Conditional Probability and Independence: Bayes' Formula, Independent Events; Discrete Random Variables: Expected Value, Variance, the Bernoulli and the Binomial Random Variables, the Poisson Random Variable, the Geometric Random Variables, Properties of the Cumulative Distribution Function; Continuous Random Variables: the Uniform Random Variable, Normal Random Variables, the Normal Approximation to the Binomial Distribution, Exponential Random Variables; Jointly Distributed Random

Variables: Independent Random Variables, Sums of Independent Random Variables, Order Statistics; Conditional Expectation: Computing Probabilities by Conditioning, Conditional Variance; Conditional Expectation and Prediction; Moment Generating Functions; the Chebyshev's Inequality and the Weak Law of Large Numbers; the Central Limit Theorem; the Strong Law of Large Numbers; Other Inequalities: the One-sided Chebyshev Inequality, the Chernoff Bounds, the Jensen's Inequality; the Poisson Process; Markov Chains.

İST 252 Probability and Statistics 3+0 4,0
Data Representation: Average, Spread, Experiments, Events; Probability: Permutations and combinations, Random variables, Probability distributions, Mean and variance of a distribution, Binomial, Poisson and hypergeometric distributions, Normal distribution, Multivariate distribution, Random sampling, Point estimation of parameters, Confidence intervals, Testing hypothesis, Decisions, Quality control, Acceptance sampling, Goodness of fit, X2 tests, Nonparametric tests, Regression, Fitting straight lines, Correlation.

İST 401 Multivariate Statistics I 3+0 4,5
Overview of Matrix Theory: Minitab and Mat lab Applications; Multivariate Gaussian Distribution and Properties; Hoteling's T2 Test: Hypothesis testing and interval estimation for multivariate data, Hypothesis testing for two independent multivariate populations, Interval estimation for two mean vectors, SPSS and Minitab applications; Multivariate Variance Analysis: One-way multivariate variance analysis, Multiple comparisons, Two-way multivariate variance analysis.

İST 402 Multivariate Statistics II 3+0 4,0
Multivariate Linear Regression Analysis: Simple linear and multiple linear and multivariate regression analysis, Tests for regression coefficients; Principal Component Analysis: Principal component matrices for principal components; Factor Analysis: Factor models, Estimation of factors, Factor coefficients and scores, Factor transformation; Cluster Analysis: Distance, Standardization and transformation of variables, Clustering methods; Discriminant Analysis; Multidimensional Scaling and Computer Applications

İST 411 Time Series Analysis 4+0 5,0
Definition and Properties of Time Series; Purposes of Time Series Analysis; Classification of Time Series: Stationary and non-stationary time series, seasonal and non-seasonal series; Forecasting in Time Series Analysis by Using One Variable Technique: Trend analysis, Moving averages, Exponential smoothing; Linear Stationary Stochastic Models: AR and MA models; Non-Stationary Linear Stochastic Models: ARIMA models, Seasonal models.

İŞL 101 Introduction to Business 3+0 4,5
Concept of business: Economic systems, Production factors, Needs and wants, Demand, Goods and services, Consumption and consumer; Success criterion: Efficiency and related concepts; Characteristics of Businesses: Goals and functions of businesses, Relationships with the environment and responsibilities of businesses, Grouping of businesses; Foundation of businesses: Foundation decision, Determining plant location; Extending Businesses; Business ethics and social responsibility (Ethical and moral rules); Concept of management; Functions of management; Human resources management; Functions of human resources management; Principles of marketing.

İŞL 101 Introduction to Business 3+0 4,5
Concept of business: Economic systems, Production factors, Needs and wants, Demand, Goods and services, Consumption and consumer; Success criterion: Efficiency and related concepts; Characteristics of Businesses: Goals and functions of businesses, Relationships with the environment and responsibilities of businesses, Grouping of businesses; Foundation of businesses: Foundation decision, Determining plant location; Extending Businesses; Business ethics and social responsibility (Ethical and moral rules); Concept of management; Functions of management; Human resources management; Functions of human resources management; Principles of marketing.

İŞL 103 Business Management 3+0 3,5
Management: Basic Concepts, Significance of Management for Business Enterprises; Comparison of Management with Similar Concepts; Development of Management Science: Classical, Behavioral, and Modern Theories; Management System: Fundamentals and Significance of Management System for Business Enterprises; Planning and Decision Making: Planing process , Types of Plans; Organization: Fundamentals, Organization Process, Comparison of organization and planning processes; Authority and Power: Characteristics and Importance of Authority and Power, Delegation of Authority; Controlling: Characteristics, Controlling process.

İŞL 116 Fundamentals of Business 3+0 3,0
Business Environment; Business Ethics & Social Responsibility in Business; Business Ownership; Management Process: Planning, Organizing, Leading, Controlling; Organizational Design; Human Resources Management; Marketing Management; Marketing Mix: 4 P's of Marketing, 4 C's of Marketing; Management Information Systems; E-Business; Accounting: Financial Accounting, Cost Accounting; Financial Management: Financial Markets, Financial Institutions; International Business; Business Strategy.

İŞL 201 Business Organization 3+0 4,0
Departmentalisation: Fundamentals and systems of departmentalisation; Authority: Definition and sources; Power: Definition and sources, Comparison of sources of authority and power; Delegation of Authority: Stages and principles; Centralization and Decentralization; Authority of Command and Staff Authority; Span of Management.

İŞL 301 Human Resources Management 3+0 4,0
Human Resources Management: Development, Goals and Principles; Functions of Human Resources Management:

Human resources planning; Recruitment, Performance Appraisal, Training, Orientation and Development; Wage and Salary Administration; Career Management; International Human Resources Management; Technology in Human Resources Management.

İŞL 301 Human Resources Management 3+0 4,0
Human Resources Management: Development, Goals and Principles; Functions of Human Resources Management: Human resources planning; Recruitment, Performance Appraisal, Training, Orientation and Development; Wage and Salary Administration; Career Management; International Human Resources Management; Technology in Human Resources Management.

İŞL 302 Production Management and Systems 3+0 4,5
Functions of Production: Definition, Inputs, Transformation process; Production Systems: Customized production, Mass Production Systems, Large-Batch Production; Product Design: Concept of design, Standardization, Leaning, Coding, Product-Based Process Design, Process-Based Design System, Production Chamber Process Design; Choosing of Technology: Expert Systems; Capacity Planing: Types of Capacity, Capacity Policies; Project Planning Models: Gantt Method CPM, PERT; Inventory Control Models; Production Planing Model.

İŞL 321 Applied Entreprenneurship 3+1 5,0
Introduction to Entrepreneurship: Basic Concepts; Climate for Entrepreneurship: Economic Perspective: Opportunity Recognition and Idea Creating: Theory and practice; Feasibility Analysis; Industry and Competitive Analysis; Marketing Plan: Theory and practices; Operations Plan: Theory and practices; Management Plan: Theory and practices; Financial Plan: Theory and practices; Business Model Development; Financing and Funding for Entrepreneurial Business; Marketing Issues in Entrepreneurial Business; Franchising and Buying an Existing Business.

İŞL 323 Human Resources Management 3+0 5,0
Introduction: Importance of human as a resource, Importance of human resources management busines; Historical Development of Human Resources Management: Personel management, Human resource management, Strategic human resource management and Talent management; Human Resources Planning: Methods and Planning instruments; Job Analysis: Methods and process, Job descriptions and Job requirements; Functions of Human Resources Management: Recruitment, Finding and selecting, Placement, Orientation, Training and development, Performance appraisal, Wage and salary administration, Career management, Occupational health and safety, Industrial relations and discipline.

İŞL 412 Strategic Management 2+0 3,0
Fundamental Principles of Strategic Management; Vision, Mission, Straegy, Politics: Strategic Management in Corporations: Definition of Strategic Management; Nature of Strategic Management; Fundamental Principles of Strategic Management; Strategic Management Processes; Development of Human Recources Between (1960-1990); Strategy; Process of Strategy, Purpose of Strategy; Analysis of External Environment; Corporate Analysis.

İŞL 454 Management of Technology 3+0 4,5
Structures of Management Organizations; Organization of Project Groups; Project Management and Its Principles; Management Functions; Employee's Organization; Basic Principles in Project Management and Formation of Project Groups; Time Management; Project Planning; PERT Technique; GANTT Charts and Other Presentation Techniques; Pricing and Cost Control.

İTA 255 Italian I 3+0 4,0
Sounds in Italian; Masculine and Feminine Definite Articles; Personal and Demonstrative Pronouns; Use and Conjugation of Verbs 'Essere? and 'Avere?; Introducing Oneself; Improving Reading Comprehension by means of Dialogs ; Describing People ; Days ; Months ; Years ; Asking the Time ; Ordinal and Cardinal Numbers.

İTA 256 Italian II 3+0 4,0
Simple and Compound Prepositions; Past Tense and Conjugation of Verbs in this Tense; Transitive and Intransitive Verbs in Past Tense; Improving Reading Skills; Analyzing Paragraphs and Texts; Interrogatives: Asking Questions; Introduction to Italian Culture and Daily Language.

JEO 201 Engineering Geology 3+0 4,5
Principles of Geology; Structure of the Earth; Geological Cycles; Minerals and Rocks: Sedimentary, igneous and metamorphic; External Processes on Land and in Sea; Internal Processes: Including deformation of rocks; Earthquake areas in Turkey; Topics of Interest to Civil Engineering (Tunnel route evaluation; case studies); Introduction to Soil and Rock slope stability.

JEO 201 Engineering Geology 3+0 4,5
Principles of Geology; Structure of the Earth; Geological Cycles; Minerals and Rocks: Sedimentary, igneous and metamorphic; External Processes on Land and in Sea; Internal Processes: Including deformation of rocks; Earthquake areas in Turkey; Topics of Interest to Civil Engineering (Tunnel route evaluation; case studies); Introduction to Soil and Rock slope stability.

KİM 113 General Chemistry 4+0 6,0
Matter: Elements, Compounds, Mixtures; Moles; Measurements and Units; Chemical Reactions; Reaction Stoichiometry; Structure of Atom; Chemical Bonds; olecules: Shape, Size, Bond strength; Properties of Gases; Gas Laws; Liquid and Solid Materials; Properties of Solutions; Acids and Bases; Water Solutions; Titrations; Buffer Solutions; Chemical Kinetics; Chemical Equilibrium; Thermodynamics; Electrochemistry.

KİM 113 General Chemistry 4+0 6,0
Matter: Elements, Compounds, Mixtures; Moles; Measurements and Units; Chemical Reactions; Reaction Stoichiometry; Structure of Atom; Chemical Bonds; olecules: Shape, Size, Bond strength; Properties of Gases; Gas Laws; Liquid and Solid Materials; Properties of Solutions; Acids and Bases; Water Solutions; Titrations; Buffer Solutions; Chemical Kinetics; Chemical Equilibrium; Thermodynamics; Electrochemistry.

KİM 115 General Chemistry Laboratory 0+2 1,5
Basic Laboratory Operations; Formula of a Hydrate; Formula Mass of a Volatile Liquid; A KclO3 Mixture and The Molar Volume of Oxygen; Formula Mass of a Solid; pH, Hydrolysis and Buffers; Vinegar Analysis; Aspirin Synthesis and Analysis; Qual 1. NH4+, Ag+, Pb2+.

KİM 115 General Chemistry Laboratory 0+2 1,5
Basic Laboratory Operations; Formula of a Hydrate; Formula Mass of a Volatile Liquid; A KclO3 Mixture and The Molar Volume of Oxygen; Formula Mass of a Solid; pH, Hydrolysis and Buffers; Vinegar Analysis; Aspirin Synthesis and Analysis; Qual 1. NH4+, Ag+, Pb2+.

KİM 117 General Chemistry I 4+0 6,0
Matter: Elements, Compounds, Mixtures; Measurements and Mole Concept; Chemical Reactions Change of Matter; Reaction Stoichiometry-Chemical Calculations: Use of Reaction Stoichiometry; Properties of Gases, Law of Gases, Thermochemical Energy Heat and Enthalpy: Enthalpy of Chemical Change, Structure of Atoms: Model of Atoms; Molecular Shape Chemical Bonds, Size and Bond force; Liquid and Solid Matters: Structure of Liquids; Structure of Solids; Material Based Carbon: Hydrocarbons, Polymers.

KİM 118 General Chemistry II 4+0 6,0
Solutions and Their Properties; Chemical Equilibrium: Defining Equilibrium Constant; Proton Transfer-Acids and Bases; Slat Solutions: Acidity and Basicity of Ions, Titrations, Buffer Solutions; Energy in the Conversion-Thermodynamic: First Law of The Thermodynamic; Electron Transfer-Electrochemistry: Galvanic Cells, Electrolyses; Kinetics-Reaction Rates: Concentration and Rate, Reaction Mechanisms; Main Group Elements I; Main Group Elements II; d-Block Transition Elements; Nuclear Chemistry: Radioactivity, Nuclear Energy.

KİM 208 Organic Chemistry 3+0 4,0
Structure, Reactivity and Mechanism; Mechanisms of Electrophilic and Nucleophilic Substitution Reactions; Chemical Bonds; Alkanes; Alkenes; Alkynes; Nomenclature of Organic Compounds; Alcohols; Alkyl Halides; Ethers; Geometric and Stereo chemical Isomers; Aldehydes and Ketones; Carboxylic Acids; Esters; Acyl Halides; Amids; Concept of Aromacity; Aromatic Substitutions; Aromatic Nitro Compounds; Phenols; Aromatic Aldehydes and Ketones; Aromatic Acids; Aromatic Amines.

KİM 208 Organic Chemistry 3+0 4,0
Structure, Reactivity and Mechanism; Mechanisms of Electrophilic and Nucleophilic Substitution Reactions; Chemical Bonds; Alkanes; Alkenes; Alkynes; Nomenclature of Organic Compounds; Alcohols; Alkyl Halides; Ethers; Geometric and Stereo chemical Isomers; Aldehydes and Ketones; Carboxylic Acids; Esters; Acyl Halides; Amids; Concept of Aromacity; Aromatic Substitutions; Aromatic Nitro Compounds; Phenols; Aromatic Aldehydes and Ketones; Aromatic Acids; Aromatic Amines.

KİM 211 Analytical Chemistry 3+0 3,0
Methods and Classification of Quantitative Analysis; Analytical Processes; Statistical Treatment of Analytical Data; Gravimetric Analysis Methods; Titrimetric Analysis Methods; Activity; Solubility; Acid-Base Equilibria in Water; pH, Polyfunctional acids and bases, Hydrolysis, Salts of polyfunctional acids, Buffer solutions; Neutralization Titration; Precipitation Titration; Complexiметric Titrations; Oxidation-Reduction Reactions; Application on Industrial Problems.

KİM 211 Analytical Chemistry 3+0 3,0
Methods and Classification of Quantitative Analysis; Analytical Processes; Statistical Treatment of Analytical Data; Gravimetric Analysis Methods; Titrimetric Analysis Methods; Activity; Solubility; Acid-Base Equilibria in Water; pH, Polyfunctional acids and bases, Hydrolysis, Salts of polyfunctional acids, Buffer solutions; Neutralization Titration; Precipitation Titration; Complexiметric Titrations; Oxidation-Reduction Reactions; Application on Industrial Problems.

KİM 226 Physical Chemistry 3+0 4,0
Basic Concepts: Ideal gases and ideal gas mixtures; Kinetic Theory of Gases; Fundamental Laws of Thermodynamics and Related Equations; First, Second and Third Law of Thermodynamics; States of matter; Phase Equilibrium; Physical Properties of matter; Real Gases; Mixtures; General Properties of Mixtures; Ideal Mixtures; Non-Electrolyte Real Mixtures; Chemical Thermodynamics: Thermochemistry; Chemical Equilibrium; Electrochemistry; Electrical Concepts; Thermodynamics of Electrolyte Solutions; Electrolytic Conductivity; Ionic Equilibrium; Electrochemical Cells; Surface Chemistry and Colloids: Interfacial and Related Phenomena; Adsorption; Chemistry of Colloids.

KİM 226 Physical Chemistry 3+0 4,0
Basic Concepts: Ideal gases and ideal gas mixtures; Kinetic Theory of Gases; Fundamental Laws of Thermodynamics and Related Equations; First, Second and Third Law of Thermodynamics; States of matter; Phase Equilibrium; Physical Properties of matter; Real Gases; Mixtures; General Properties of Mixtures; Ideal Mixtures; Non-Electrolyte Real Mixtures; Chemical Thermodynamics: Thermochemistry; Chemical Equilibrium; Electrochemistry; Electrical Concepts; Thermodynamics of Electrolyte Solutions; Electrolytic Conductivity; Ionic Equilibrium; Electrochemical Cells; Surface Chemistry and Colloids:

Interfacial and Related Phenomena; Adsorption; Chemistry of Colloids.

KİM 230 Analytical Chemistry Laboratory 0+3 3,0
Gravimetric Method Applications; Determination of iron, Determination of sulphate; Titrimetric Method Applications; Acid-Base titrations, Determination of cloride by Mohr method, Determination of water hardness with EDTA; Spectroscopic Determination of Active Ingrediends in Tablets; Determination of Ethyl Alcohol in Alcholic Beverages by Gas Chromatography (GC); Determination of Lead in Brass by Atomic Absorbtion Spectroscopy; Infrared Determination of a Simple Organic Molecule.

KİM 230 Analytical Chemistry Laboratory 0+3 3,0
Gravimetric Method Applications; Determination of iron, Determination of sulphate; Titrimetric Method Applications; Acid-Base titrations, Determination of cloride by Mohr method, Determination of water hardness with EDTA; Spectroscopic Determination of Active Ingrediends in Tablets; Determination of Ethyl Alcohol in Alcholic Beverages by Gas Chromatography (GC); Determination of Lead in Brass by Atomic Absorbtion Spectroscopy; Infrared Determination of a Simple Organic Molecule.

KİM 231 Physical Chemistry Laboratory 0+3 3,0
Determination of the Molecular Mass of a Liquid; Viscosity Measurements with the Falling Ball Viscometer; Determination of the Critical Quantities of a Real Gas; Freezing Point Depression; Determination of the Enthalpy of Combustion with a Calorimetric Bomb; Evaporative Equilibrium; Vapour Pressure of Mixtures of İdeal Fluids; Boiling Point Diagram of a Binary Mixture; Distribution Equilibrium; Determination of the Surface Tension of Pure Liquids with the Bubble Pressure Method; Conductivity of Strong and Weak Electrolytes; Electrogravimetric Determination of Copper.

KİM 231 Physical Chemistry Laboratory 0+3 3,0
Determination of the Molecular Mass of a Liquid; Viscosity Measurements with the Falling Ball Viscometer; Determination of the Critical Quantities of a Real Gas; Freezing Point Depression; Determination of the Enthalpy of Combustion with a Calorimetric Bomb; Evaporative Equilibrium; Vapour Pressure of Mixtures of İdeal Fluids; Boiling Point Diagram of a Binary Mixture; Distribution Equilibrium; Determination of the Surface Tension of Pure Liquids with the Bubble Pressure Method; Conductivity of Strong and Weak Electrolytes; Electrogravimetric Determination of Copper.

KİM 282 Organic Chemistry Laboratory 0+3 3,0
Separation, Purification Methods: Filtration, Crystallization, Sublimation, Extraction, Distillation methods and applications; Chromatography Methods and Applications: Thin layer chromatography, Column chromatography; Nucleophilic Substitution Reactions; Elimination and Addition Reactions; Electrophilic Aromatic Substitution Reactions; Catalytic Hydrogenation Reactions; Esterification Reactions: Synthesis of soap, Synthesis of biodiesel from vegetable oil; Diazonium Salt Synthesis: Synthesis of dye pigment; Polymerization; Qualitative Organic Analysis: Solubility test, Functional group analysis.

KİM 327 Organic Chemistry 3+0 4,0
Structure, Reactivity and Mechanism; Mechanisms of Electrophilic and Nucleophilic Substitution Reactions; Chemical Bonds; Alkanes; Alkenes; Alkynes; Nomenclature of Organic Compounds; Alcohols; Alkyl Halides; Ethers; Geometric and Stereo chemical Isomers; Aldehydes and Ketones; Carboxylic Acids; Esters; Acyl Halides; Amids; Concept of Aromacity; Aromatic Substitutions; Aromatic Nitro Compounds; Phenols; Aromatic Aldehydes and Ketones; Aromatic Acids; Aromatic Amines.

KİM 436 Chemical Technologies 4+0 5,0
Water Conditioning: Demineralization and Desalting; Energy and Fuels: Fossil fuels, Coal, Destructive distillation of coal, Coking; Ceramic Industries: Raw materials, Chemical conversions, White wares, Refractories, Specialized ceramic products; Glass Manufacturing; Food: Food processing, By products, Agrochemical industries; Fragrances and flouring industry, Food additives; Aromatics; Oils: Vegetable oils, Animal fats; Soap and Detergents; Sugar; Paper; Plastic Industries; Rubber; Petroleum Processing: Refining, Manufacture of petrochemicals; Pharmaceutical Industries: Manufacturing from natural and synthetic raw materials.

KİM 457 Chemical Technologies I 3+0 4,0
Introduction to Crushing and grinding, Crushing and grinding Techniques, Introduction to Ceramic Technology, Production Methods of Ceramics, Introduction to Cement Production Technology, Production Methods of Cement, Introduction to Iron-Steel-Aluminum Production Technology, Production Methods of Iron-Steel-Aluminums, Introduction to Glass Industries, Production Methods of Glasses, Methods of water purification Technology, Wastewater Treatment Methods, Methods of Fertilizer Production, Methods of Ammonia Production, Methods of Pulp and Paper Production, Sugar and Starch Industries and Production Methods.

KİM 458 Chemical Technologies II 3+0 4,0
Introduction to Dyes and pigments industry, Types of Dyes and pigments and Production Methods, Introduction to Soap and Detergent Industry, Types of Soap and Detergents and Production Methods, Introduction to Corrosion industry, Types of Oil and Fats and Production Methods, Introduction to Milk and By-Product Industries, Types of Milk and By-Products and Production Methods, Introduction to Rubber-Plastic Industries, Types of Rubber-Plastics and Production Methods, Introduction to Acid Industries, Types of Acids and Production Methods, Fermentation Industries and Production Methods, Types of Industrial Gases and Production.

KMH 105 Technical English 2+0 2,5
The courses rainforces academic writing, reading, translation and listening skills on the technical subjects. Report writing

is emphasised and also audio-visual practices to improve the chemical engineering terminology involving vocabulary are made.

KMH 108 Introduction to Chemical Engineering 2+0 3,5
Description of Different Sample Processes; Fluid mechanics; Heat Transfer and Applications; Heat Exchangers; Evaporators; Mass Transfer and Applications; Phase Equilibrium in the Stage Separation Processes; Fractional Distillation; Solid-Liquid and Liquid-Liquid Extractions, Gas Absorption, Humidification; Drying of Solids; Operations Including Solid Particles; Chemical Reactions and Reactors.

KMH 210 Instrumental Analysis 3+0 3,0
Interaction of Materials and Beam; Spectroscopy: Theory, Infrared spectroscopy, Ultraviolet and visible spectroscopy, Qualitative and quantitative applications, Atomic Absorption Spectroscopy, Nuclear Magnetic Resonance Spectroscopy; Chromatographic Methods: Theory, Paper Chromatography, Thin Layer Chromatography, Column Chromatography, Gas Chromatography (GC).

KMH 212 Computer Applications in Chemical Engineering 3+0 4,0
The Fortran Programming; Use of Matlab; Using Numerical Computer Methods to Solve Chemical Engineering Problems; Introduction to Software Used in the Simulation and Design of Chemical Engineering Systems.

KMH 212 Computer Applications in Chemical Engineering 3+0 4,0
The Fortran Programming; Use of Matlab; Using Numerical Computer Methods to Solve Chemical Engineering Problems; Introduction to Software Used in the Simulation and Design of Chemical Engineering Systems.

KMH 213 Chemical Process Calculations 3+2 6,0
Material Balance: Recycle and bypass, Balances on reactive processes; Combustion reactions; Single-phase Systems: Ideal gases, Equations of state for non-ideal gases, Compressibility factor; Multicomponent gas-liquid systems; Energy Balances: Forms of energy, Kinetic and potential energy, Energy balances on closed and open systems, Balances on Non-reactive Processes: Elements of energy balance calculations, Effects of temperature and pressure on energy changes; Balances on Reactive Processes: Heats of reaction, Hess's law, Heats of formation and combustion, Fuels and combustion.

KMH 303 Mathematical Modeling in Chemical Engineering 4+0 5,0
Obtaining of Steady and Unsteady State Momentum, Mass and Energy Equations for Lumped and Distributed Systems Including Physical and Chemical Changes; Ordinary Differential Equations and Their Analytical Solutions; Laplace Transforms; Matrices; Series and Numerical Solutions of the Ordinary Differential Equations; Formulation of Partial Differential Equations and Their Solutions; Finite Differences

KMH 307 Experimental Design Techniques 3+0 4,0
Introduction to Quality Engineering and Taguchi Method; Introduction to Experimental Design and Variance Analysis; Basic Statistics; Factorial and Partial Factorial Experiments; Introduction to Orthogonal Arrays: Definition, Two-three level standard orthogonal arrays, Interaction graphics; Modification of Orthogonal Arrays and Inner and Outer Orthogonal Arrays; Planning and Conducting Successful Experiments; Factors Affecting the Process; Methods Used For Detecting Controllable and Non-Controllable Factors; Taguchi Loss Functions; Signal/Noise Ratio; Dynamic Quality Characteristics.

KMH 307 Experimental Design Techniques 3+0 4,0
Introduction to Quality Engineering and Taguchi Method; Introduction to Experimental Design and Variance Analysis; Basic Statistics; Factorial and Partial Factorial Experiments; Introduction to Orthogonal Arrays: Definition, Two-three level standard orthogonal arrays, Interaction graphics; Modification of Orthogonal Arrays and Inner and Outer Orthogonal Arrays; Planning and Conducting Successful Experiments; Factors Affecting the Process; Methods Used For Detecting Controllable and Non-Controllable Factors; Taguchi Loss Functions; Signal/Noise Ratio; Dynamic Quality Characteristics.

KMH 308 Mass Transfer 4+0 5,0
Basic Principles of Mass Transfer: Molecular diffusion, Mass transfer coefficients, Phase equilibria; Gas-Liquid Operations: Distillation, Gas absorption, Humidification; Extraction; Leaching; Drying; Adsorption; Mass Transfer Applications and Design: Mc Cabe Thiele and enthalpy-concentration methods, Determination of plate spacing and ideal number of plates.

KMH 308 Mass Transfer 4+0 5,0
Basic Principles of Mass Transfer: Molecular diffusion, Mass transfer coefficients, Phase equilibria; Gas-Liquid Operations: Distillation, Gas absorption, Humidification; Extraction; Leaching; Drying; Adsorption; Mass Transfer Applications and Design: Mc Cabe Thiele and enthalpy-concentration methods, Determination of plate spacing and ideal number of plates.

KMH 310 Heat Transfer 4+0 5,0
Basic Principles of Heat Transfer: Heat transfer conduction in solids, Principles of heat flow in fluids, Heat transfer without phase change, Radiation heat transfer; Heat transfer Applications: Double pipe heat exchangers, Design of shell and tube heat exchangers, Design of single and multi stage boilers.

KMH 310 Heat Transfer 4+0 5,0
Basic Principles of Heat Transfer: Heat transfer conduction in solids, Principles of heat flow in fluids, Heat transfer without phase change, Radiation heat transfer; Heat transfer Applications: Double pipe heat exchangers, Design of shell

and tube heat exchangers, Design of single and multi stage boilers.

KMH 313 Biorefinery Processes 3+0 4,0
Definition and Classification of Biorefinery, Triglyceride based biorefineries, Sugar and starch based biorefineries, Lignocellulose based biorefineries; Biological and chemical processes: Combustion and gasification, Liquefaction and pyrolysis, Biogas and biodiesel, Conversion of lignin and C5-C6 sugars to fine chemicals: Platform chemicals, homogenous and heterogeneous catalyst based conversion processes, Biological catalyst based conversion processes.

KMH 314 Chemical Reaction Engineering I 4+0 5,0
Fundamentals of Chemical Reaction Kinetics; Concept of Reaction Rate; Classification of Chemical Reactions; Kinetics of Homogeneous Reactions: Reaction mechanisms, Interpretation of constant-volume batch reactor data; Interpretation of variable-volume batch reactor data, Homogenous catalyst; Temperature and Reaction Rate; Heats of Reaction and Equilibrium; Introduction to Heterogeneous Reaction Kinetics: Fluid-fluid reactions, Fluid-particle reactions.

KMH 316 Biotechnology 3+0 4,0
Introduction to biotechnology: History, Principles; Microorganisms: Eukaryotes, Prokaryotes, Viruses; Cell Cultivation: Microbial, plant, animal cell cultures; Structure and Properties of Biomolecules; Genetic Engineering: Chromosome structure, DNA replication, Genomes, RNA and protein synthesis, Mutagenesis; Metabolic Pathways; Cell Growth Kinetics; Fermentation Techniques; Recovery and Purification of Products; Applications of Biotechnology; Biosafety and Ethics.

KMH 317 Chemical Engineering Thermodynamics I 3+0 4,5
The Scope of Thermodynamics: Concepts of Force, Temperature, Pressure, Work, Energy and Heat; First Law of Thermodynamics: Internal energy, Energy balance for closed systems, State functions, Enthalpy, Mass and energy balances for open systems; Second Law of Thermodynamics: Heat engines, Carnot cycle, Entropy, Ideal work; Third Law of Thermodynamics; Thermodynamic Properties of Fluids: Property relations for homogeneous phases, Two-phase systems, Thermodynamic diagrams; Thermodynamics of Flow Systems; Production of Power from Heat; Refrigeration and Liquefaction: Carnot refrigerator, Heat pumps, Liquefaction processes.

KMH 317 Chemical Engineering Thermodynamics I 3+0 4,5
The Scope of Thermodynamics: Concepts of Force, Temperature, Pressure, Work, Energy and Heat; First Law of Thermodynamics: Internal energy, Energy balance for closed systems, State functions, Enthalpy, Mass and energy balances for open systems; Second Law of Thermodynamics: Heat engines, Carnot cycle, Entropy, Ideal work; Third Law of Thermodynamics; Thermodynamic Properties of Fluids: Property relations for homogeneous phases, Two-phase systems, Thermodynamic diagrams; Thermodynamics of Flow Systems; Production of Power from Heat; Refrigeration and Liquefaction: Carnot refrigerator, Heat pumps, Liquefaction processes.

KMH 318 Chemical Engineering Thermodynamics II 3+0 4,5
Thermodynamic Properties of Fluids: Property relations for homogeneous phases, Residual properties, Two-phase systems; Diagrams and Tables for Thermodynamic Properties; Solution Thermodynamics: Fundamental property relation, Chemical potential and phase equilibria, Partial properties, Fugacity; Applications of Solution Thermodynamics; Chemical Reaction Equilibria; Phase Equilibria: Equilibrium and stability, Vapor-liquid and Liquid-liquid equilibria, Vapor-liquid-liquid equilibrium, Solid-liquid and solid-vapor equilibria; Thermodynamic Analysis of Steady-State Flow Processes.

KMH 318 Chemical Engineering Thermodynamics II (Kimya Mühendisliği Termodinamiği II) 3+0 4,5
Thermodynamic Properties of Fluids: Property relations for homogeneous phases, Residual properties, Two-phase systems; Diagrams and Tables for Thermodynamic Properties; Solution Thermodynamics: Fundamental property relation, Chemical potential and phase equilibria, Partial properties, Fugacity; Applications of Solution Thermodynamics; Chemical Reaction Equilibria; Phase Equilibria: Equilibrium and stability, Vapor-liquid and Liquid-liquid equilibria, Vapor-liquid-liquid equilibrium, Solid-liquid and solid-vapor equilibria; Thermodynamic Analysis of Steady-State Flow Processes.

KMH 323 Biochemical Engineering Fundamentals 3+0 4,0
Definition and importance of bioprocesses; Enzymes: Enzyme kinetics, Enzyme reactors, Immobilized enzymes, Industrial applications of enzymes; Cell cultivation and kinetics; Batch and continuous fermentation processes and industrial applications: Production of organic acids, ethyl alcohol; antibiotics and vitamins.

KMH 351 Sugar Technology 3+0 4,0
Sugar Beet Root Composition; Preparation: Storage, Cleaning, Sampling, Grading; Losses; Determination of Sugar Content; Production and Purification of Liqueur; Evaporation; Crystallization; Dehumidification; Molasses; Basic equipment and instrumentation.

KMH 352 Water Technology 3+0 4,0
Characteristics of Water: Physical Characteristics, Chemical characteristics; Physical Purification; Chemical Purification; Industrial Water Quality; Boiler Water Quality; Cooling Water Quality; Swimming Pool Water Quality; Irrigation Water Quality; Disinfection; Corrosion; Toxic Materials

KMH 353 Air Pollution Removal Equipments 3+0 4,0
The reasons of air polution, Effects of Air pollutions: Effects on living and non-living creatures; Control of particules:

Precipitators, Centrifugal precipitators and electrostatical precipitators, Filters and varieties; Control of volitile organic components; Removal devices of sulfurdioxide and sulfur compounds and principals of operation; Removal devices of nitrogen oxides and principals of operation; Equipments that are added to motor vehicles and principals of operation.

KMH 354 Boron Technology 3+0 4,0
General information about inorganic boron compounds, : Production technologies of inorganic bor compounds from boron ore: Sodium borates, Sodium 1-2 borates, Dehidration and drying of boraxes, Production of borax: Production of borax from tincal in Turkey, Dry borax production, Properties of boric acid and it's usage: Production methods, Sulphuric asit and boric acid production from colemanite, Devices thats are used for boric acid; General properties of sodium perborate and it's usage; Boron compounds and biological properties of boron and it's environmental waste problems.

KMH 355 Food Chemistry 3+0 4,0
Comprehensive evaluation of individual components of foods; Water; Amino acids and proteins, Lipids, Carbohydrates; Vitamins; Enzymes; Minerals and trace elements; Food additives; Their significance for food quality and safety.

KMH 356 Buble Column Technology 3+0 4,0
Bubble column types : Operating states , gas distributers and operating states; Mass transfer and reactions; equipments for finding out absorption parameters, gaz hold up and mass transfer coefficients: Flow regimes, bubble types, Calculations of bubble diameters, Calculations of bubble rising velocity, Calculations of gas-liquid interface area, Calculations for three passes bubble columns.

KMH 357 Electrochemistry 3+0 4,0
Electrochemical Terms and Concepts; Ionic conductivity; Electrolyte Equilibrium; Electrochemical cells; Fuel Cells: Electrochemical principles of fuel cells, Performance characterization of fuel cells; Electrolysis: Over potential, Decomposition potential; Accumulation of metals on cathode by electrolysis, Effect of concentration polarization on dissociation potential; Applications of electrolysis; Corrosion: Theory of electrochemical corrosion; Methods of Corrosion Protection: Cathode protection, Anodic protection, Inhibitors; Electrochemical Manufacturing Processes: Chlor-alkali industry, Metal production; Other inorganic electrolytic processes.

KMH 357 Electrochemistry 3+0 4,0
Electrochemical Terms and Concepts; Ionic conductivity; Electrolyte Equilibrium; Electrochemical cells; Fuel Cells: Electrochemical principles of fuel cells, Performance characterization of fuel cells; Electrolysis: Over potential, Decomposition potential; Accumulation of metals on cathode by electrolysis, Effect of concentration polarization on dissociation potential; Applications of electrolysis; Corrosion: Theory of electrochemical corrosion; Methods of Corrosion Protection: Cathode protection, Anodic protection, Inhibitors; Electrochemical Manufacturing Processes: Chlor-alkali industry, Metal production; Other inorganic electrolytic processes.

KMH 358 Measurement and Control in Chemical Processes 3+0 4,0
General Considerations in Measurement; Flow Measurement; Level Measurement; Temperature Measurement; Pressure Measurement; Density Measurement; Security and Miscellaneous Sensors; Control Theory, Selection of Control Valve and Sizing; Regulators and Final Control Element; Optimization and Control of Unit Operations in Chemical Processes

KMH 358 Measurement and Control in Chemical Processes 3+0 4,0
General Considerations in Measurement; Flow Measurement; Level Measurement; Temperature Measurement; Pressure Measurement; Density Measurement; Security and Miscellaneous Sensors; Control Theory, Selection of Control Valve and Sizing; Regulators and Final Control Element; Optimization and Control of Unit Operations in Chemical Processes

KMH 360 Carbon Materials 3+0 4,0
The carbon element and its various forms: The element carbon, Carbon terminology, Carbon and organic chemistry; Old but new materials: Carbons; Graphite structure, its physical and chemical properties; Synthetic carbon and graphite: Carbonization and graphitization; Highly oriented graphite; Carbon fibers, Applications of carbon fibers; Porous carbons: Activated carbon and adsorption; Carbon foam; The fullerene molecules; Carbon nanotubes, Carbon nanotube applications.

KMH 406 Separation Process 3+0 5,0
Investigation of Separation Process based on the Physical Properties of Mixtures; Process Variables (Factors) in Separation Process; Phase Flows, Recycle Flows; Total Material Balance Equation in Whole Process; Component Material Balances; Phase Balances; Vapor-Liquid, Liquid-liquid and Solid-liquid Balance Ratios; Computer Software Use in Separation Process: Liquid-liquid extraction in constant equilibrium ratio system, Distillation in constant molar flow.

KMH 407 Fuel and Energy Technologies 3+0 4,0
Energy; Energy Sources; Energy Conversion; Solid Fuels; Formation and Structure of Coal; Classification of Coal; Liquid and Gaseous Fuels; Physical Processing of Crude Petroleum; Natural Gas; Conversion Processes; Cracking; Reforming and Other Processes; Carbonization and Gasification Processes; Calorific Value: Tests on liquid fuels; Flue Gas Analysis; Calculations in Fuel and Energy.

KMH 409 Oil Technology 3+0 4,0
Raw materials: Resources of animal fat, Resource of vegetable oil, Resource of mineral, Oil; Oil seeds: Storing, Cleaning, Conditioning, Sizing; Oil Recovery Methods: Mechanical pressing, Solvent extraction; Oil Refination:

Removal of adhesive material; Removal of coloring material; Removal of odor, Removal of gums; , Quality of Edible Oil; Applications of Waste Oil Processing.

KMH 410 Coal Technologies 3+0 4,0
Coal Formation Petrography and Classification of Coal; Physical Properties of Coal and Other Technological Properties; Thermal Properties of Coal; Methods of Coal Production and Effect of Coal Quality; Desulphurisation of Coal: Combustion of Coal; Preparation of Coal-Water Mixtures and Combustion of coal-Water Mixtures; Coking of Coal; Pyrolysis of Coal; Low Temperature Carbonisation of Coal; Gasification of Coal; Underground Gasification of Coal; Coal Liquefaction.

KMH 411 Polymer Technology 3+0 4,0
Polymer and Polymer Terms; Types of Polymer and Polymerization Reactions; Structure of Polymers, Molecular Weight and Distribution; Polymeric Solutions and Gel Forms; Morphology, Reology and Basic Properties of Polymers; Reactors for Polymers and Chemical Reactions of Polymers; Handling of Polymers; Analysis and Test Methods of Polymers; Industrial Applications of Polymers.

KMH 412 Petroleum Refinery Engineering 3+0 4,0
History and Development of Refining; Petroleum Refinery; Formation and Content of Crude Oil; Classification of Crude Oil; Distillation of Crude Oil; Acquirement of Light Hydrocarbon; Naphtha Hydrogenation; Evaluation of gasoline: Assessment of Gasoline; Acquirement of Aromatic Hydrocarbons; Thermal Cracking: Acquirement of gas; Obtaining of Cracking Gasoline; Isomerization of Butane; Alkylation; Extraction of Furfural; Hydrogenation of Lubricating Oil; Lubricating Oil and Obtainment of Wax; Removal of Asphalt with Propane; Coking; Asphalt Processing; Wastewater Treatment.

KMH 415 Process Dynamics and Control 4+0 5,0
Definition of Process Control and Its Content; The Laplace Transforms; Linear Open-Loop Systems: Modeling of the First Order Systems, Transfer functions and Dynamic Behaviors; Dynamic behaviors of the First Order Systems in Series; Second Order Systems and Transportation Lag, Linear Closed-Loop Systems: Control System, Controllers and Final Control Elements; Dynamic Behavior of a Basic Control System; Stability; Root Locus; Design of Feedback Controller; Frequency Response Analyze: Nyquist and Bode Diagrams; Design of a Control System via Frequency Response.

KMH 415 Process Dynamics and Control 4+0 5,0
Definition of Process Control and Its Content; The Laplace Transforms; Linear Open-Loop Systems: Modeling of the First Order Systems, Transfer functions and Dynamic Behaviors; Dynamic behaviors of the First Order Systems in Series; Second Order Systems and Transportation Lag, Linear Closed-Loop Systems: Control System, Controllers and Final Control Elements; Dynamic Behavior of a Basic Control System; Stability; Root Locus; Design of Feedback Controller; Frequency Response Analyze: Nyquist and Bode Diagrams; Design of a Control System via Frequency Response.

KMH 425 Chemical Reaction Engineering II 4+0 5,0
Material and Energy Balances for Reactors; Design for Ideal Reactors: Batch reactors, Continuous stirred tank reactors, Plug-flow reactors, Ideal reactors connected in series/parallel; Design for Multiple Reactions and Product Distribution; Autocatalytic Reactions and Recycle Reactor; Temperature and Pressure Effects; Introduction to Heterogeneous Reactor Design: Design for fluid-fluid reactions, Design for fluid-particle reactions.

KMH 429 Special Topics in Chemical Engineering 1+2 4,0
Mass and heat transfer, separation processes, chemical kinetics, thermodynamics, chemical process calculations, process control; Chemical technologies such as coal, petroleum, biomass, oil, food and natural products, cement, paper, drug, fertilizer and environment.

KMH 429 Special Topics in Chemical Engineering 1+2 4,0
Mass and heat transfer, separation processes, chemical kinetics, thermodynamics, chemical process calculations, process control; Chemical technologies such as coal, petroleum, biomass, oil, food and natural products, cement, paper, drug, fertilizer and environment.

KMH 431 Chemical Engineering Design I 4+0 6,0
Process Evaluation: Mass and heat balances; Flow Sheets; Process Plant Design: Cost estimation and optimization; Design Information and Data; Materials of Construction; Piping and Instrumentation; Safety and Loss Prevention; Plant Location and Site Selection; Plant Layout; Environmental Considerations.

KMH 432 Chemical Engineering Design II 4+0 6,0
Selection of Main and Ancillary Equipment, Specification and Design; Heat Exchange Equipment; Towers; Packed Towers; Sieve and Valve Tray Design; Mechanical Design of Process Equipment; Scale-up of Process Equipment; Software Applications Used in the Simulation and Design of Chemical Engineering Systems.

KMH 433 Industrial Equipments in Chemical Engineering 3+0 4,0
Basic concepts of Chemical Engineering; Chemical Reactions and Chemical Reactors; Fluid Mechanics Equipments: Manometers, Pressure indicators, Fluid flow measurement elements, Valves, Fluid mover equipments; Heat Transfer Equipments: Heat exchangers, Boilers, Evaporators; Mass Transfer Equipments: Distillation Columns, Extractors, Absorbers, Cooling towers, Drier-dehumidifiers, Adsorbers; Equipment within the scope of thermodynamics: Nozzles, Diffusers, Compressors, Fans, Sprayers; Thermal conversion and power conversion equipments; Solid particle processing equipment; Investment cost analysis.

KMH 434 Chemical Engineering Applications 2+4 8,0
Synthesis of theoretical and practical engineering knowledge; literature review; research techniques in chemical engineering.

KMH 434 Chemical Engineering Applications 2+4 8,0
Synthesis of theoretical and practical engineering knowledge; literature review; research techniques in chemical engineering.

KMH 435 Chemical Engineering Laboratory I 0+4 6,0
Tubular and Plate Heat Exchangers Experiment; Gas Phase Diffusion Coefficient Experiment; Liquid Phase Diffusion Experiment; Temperature Measurement and Calibration Experiment; Batch Reactor Experiment; Measurement of Fluid Friction (Osbourne-Reynolds) Experiment, Fixed and Fluidized Bed Experiment; Measurement of Viscosity Experiment; Ion Exchange Experiment; Heat Transfer from Radial and Linear Surfaces Experiment.

KMH 435 Chemical Engineering Laboratory I 0+4 6,0
Tubular and Plate Heat Exchangers Experiment; Gas Phase Diffusion Coefficient Experiment; Liquid Phase Diffusion Experiment; Temperature Measurement and Calibration Experiment; Batch Reactor Experiment; Measurement of Fluid Friction (Osbourne-Reynolds) Experiment, Fixed and Fluidized Bed Experiment; Measurement of Viscosity Experiment; Ion Exchange Experiment; Heat Transfer from Radial and Linear Surfaces Experiment.

KMH 436 Chemical Engineering Laboratory II 0+4 6,0
Tubular and Continuous Stirred Tank Reactor Experiment; Gas Absorption Experiment; Distillation Experiment; Evaporator Experiment; Extraction Experiment; Process Control Experiment; Petroleum Distillation Experiment; Shell and Tube Heat Exchanger and Jacketed Vessel Experiment; Unsteady State Heat Transfer Experiment; Extended Surface Heat Transfer and Radiant Heat Transfer Experiment.

KMH 436 Chemical Engineering Laboratory II 0+4 6,0
Tubular and Continuous Stirred Tank Reactor Experiment; Gas Absorption Experiment; Distillation Experiment; Evaporator Experiment; Extraction Experiment; Process Control Experiment; Petroleum Distillation Experiment; Shell and Tube Heat Exchanger and Jacketed Vessel Experiment; Unsteady State Heat Transfer Experiment; Extended Surface Heat Transfer and Radiant Heat Transfer Experiment.

KMH 437 Alcohol Based Fuels 3+0 4,0
Introduction: Global energy problem; Alcohol-based Fuels: Production of alcohols; Production of Methanol from Biomass: Process technology; Production of Ethanol from Corn: Industrial production process; Production of Methanol from Landfill-Gas: Production of methanol from landfill gas; Domestic uses of methanol; Production of Butanol from Corn: Biochemistry of butanol production; Process economy; Ethanol-Based Fuels: Ethanol-based fuels and their uses; Production of Hydrogen from Methanol: Catalytic steam reforming process; Production of Hydrogen from Ethanol: Catalytic ethanol reforming; Alcohol Based Bio-Fuel Cells with Enzyme Electrodes.

KMH 438 Computer Aided Design in Chemical Engineering 3+0 4,0
Preparation of flow sheet; Mixer and splitter simulation; Simulation of vapor-liquid equilibrium of binary mixtures; Heat exchanger simulation; Batch reactor simulation; Continuous stirred tank reactor (CSTR) simulation; Plug flow reactor (PFR) simulation; Gas absorber simulation; Extraction simulation; Recycle module simulation; Simulation of a simple chemical process: Selection of a chemical process and definitions of main items; Design of the process as a whole.

KMH 439 Catalytic Materials 3+0 4,0
Introduction: The phenomenon catalysis, Action of catalysts; Classification of catalysts; Comparison of homogeneous and heterogeneous catalysis; Heterogeneous catalyst materials, properties and preparation: Physical, chemical and dynamic properties of catalysts; Preparation of catalyst supports; Deposition of the active components onto a support; Principles and objectives of catalyst characterization: Determining properties of catalysts; Solid Catalyzed Reaction: Steps in a heterogeneous catalytic reaction; Adsorption and desorption; Reaction and diffusion resistances for a catalytic reaction; Kinetics of catalytic surface reactions; Catalyst deactivation.

KMH 440 Polymer Materials Science 3+0 4,0
Introductory concepts and definitions of polymers; Chemical structure of polymers; Chemical structure and properties of polymers; Tests applied to polymers; Optical properties of polymers; Mechanical properties of polymers; Electrical properties of polymers; Thermal properties of polymers; Solubility and chemical stability of polymers; Polymer processing; Polymer composites; Applications of polymer composites.

KMH 441 Catalysis 3+0 4,0
General characteristics of catalysts; Classification and preparation methods; Principles and mechanisms of catalysis; Kinetics of fluid-solid catalytic reactions; Internal and external diffusion; Adsorption, surface reaction and desorption; Reactor design for heterogeneous catalytic reaction; Deactivation of catalysts.

KMH 451 Phase Equilibrium 3+0 4,0
The Phase Rule and Duhem's Theorem; Thermodynamic Properties of Real Matters; Stability and Equilibrium Equations in Single Component Systems; State Function; Phase Equilibrium of Pure Fluids; Vapor Pressure; Multiphase System; Multicomponent System; Nature and Criteria of Phase Equilibrium; Multiphase System; Models of Activity Coefficients; Phase Equilibrium in Mixtures; Gas-Liquid and Liquid-Liquid Vapor Equilibrium; Supercritical Fluids; Distribution Coefficient.

KMH 452 Food Processing 3+0 4,0
Basic methods of food preservation. Physical and chemical characteristics of Food; Industrial Processing: Dehydration, Freezing, Canning, Fermentation, Irradiation, Chemicals; Storage and Transportation.

KMH 453 Operations of Solid Particles 3+0 4,0
Properties and Handling of Particulate Solids;Size Reduction Equipment; Mixing of Solids and Pastes; Mechanical Separations:Screening, Screening Equipment, Separation through Fluids: Gravity Settling, Centrifugal Settling; Filtration: Principles of Filtration and Clarification.

KMH 454 Heat Transfer Equipments 3+0 4,0
Heat Exchangers: Types of Heat Exchangers; Condensers; Boilers; Extended Surface Equipment; Scraped Surface Exchangers; Evaporators:Types of Evaporators

KMH 455 Food Additives 3+0 4,0
Definitions of Food Additives; Antioxidants; Emulsifying Agents; Gums; Food Preservatives; Flavourings; Flavour Enhancers; Coloring Agents; Chelat Agents; Sweateners Anticoagulants; Flour Additives

KMH 456 Occupational Health and Safety 3+0 4,0
Mortality and Serious Injury in the Workplace; Prevention of Accidents: Workers Compensation for Risky Working Environments; Magnetic Fields; Cancer and Other Effects; Diseases Caused by Organic Dusts; Vibration and Noise; Industrial Hygiene; Characteristics of Some Toxic Materials and Their Effects: Properties of Some Hazardous Organic Compounds, Organic Solvent Neurotoxicity; Characteristics and Classification of Explosives: Exposure assesments for Risk Control; Occupational Health and Safety Regulations. Quality Assurance in Occupational Health Services; Promoting Safe Behaviour. Preparation of MSDS Forms: Emergency and First-Aid Applications.

KMH 457 Transport Phenomena 3+0 4,0
Momentum Transfer: Mechanism of viscosity and momentum transfer, Velocity distribution in laminar flow, Equation of continuity, Equation of motion; Energy Transfer: Mechanism of heat conductivity and energy transfer, Temperature distribution in solid and laminar flow, Equation of change in nonisotermal systems; Mass Transfer: Mechanism of diffusivity and mass transfer, Concentration distribution in solid and laminar flow, Equations of change at multicomponent systems

KMH 458 Chemical Process Optimization 3+0 4,0
Problem Formulation: The Nature and Organization of Optimization Problems; Fitting Models to Data; Formulation of Objective Functions; Optimization Theory and Methods: Basic Concepts of Optimization; Optimization of Unconstrained Functions-One Dimensional Search; Unconstrained Multivariable Optimization; Linear Programming and Applications; Nonlinear Programming with Constrains; Optimization of Staged and Discrete Processes; Application of Optimization to the Chemical Engineering Processes.

KMH 458 Chemical Process Optimization 3+0 4,0
Problem Formulation: The Nature and Organization of Optimization Problems; Fitting Models to Data; Formulation of Objective Functions; Optimization Theory and Methods: Basic Concepts of Optimization; Optimization of Unconstrained Functions-One Dimensional Search; Unconstrained Multivariable Optimization; Linear Programming and Applications; Nonlinear Programming with Constrains; Optimization of Staged and Discrete Processes; Application of Optimization to the Chemical Engineering Processes.

KMH 460 Membrane Seperation Processes 3+0 4,0
Membrane Materials; Transport in Membrane: Liquid Diffusion, Gas Diffusion, Cascades; Dialysis and Electrodialysis; Membrane Structure: Reverse Osmosis Membranes, Microfilitration Mambrenes, Ultra Filitration Membranes; Pervaporation; Gas Permeation.

KMH 462 Membrane Science and Technology 3+0 4,0
Introduction to Membrane Processes: Driving forces in membranes, Flow configuration, Types of membrane processes, Membrane transport mechanism; Membrane Materials and Material Properties; Preparation Techniques for Membranes; Characterization Techniques for Membranes; Pressure Driven Membrane Processes; Concentration Driven Membrane Processes; Thermally Driven Membrane Processes; Electrically Driven Membrane Processes; Membrane Reactors; Applications of Membrane Technology.

KÜL 199 Cultural Activities 0+2 2,0
Participating Actively or as a Spectator in Sports Activities; Participating in Activities Arranged by the Counseling Center; Participating in Workshops in Art; Education on Museums; Participating in Art Trips; Participating in Cultural Trips; Participating in and Taking Duty in activities such as Cinema, theatre, scientific Meeting etc.; Taking duty in Clubs; Being a Student Representative and Participating in Environmental Activities.

KÜL 451 History of Science and Engineering 3+0 4,5
Science and Technology in Ancient Age: Mesopotamia, Ancient Egypt, Ancient Greece and Rome, Ancient Anatolia, Ancient Chinese and Central Asian Civilizations; Science and Technology in Middle Age: Medieval Europe; Islamic World; Renaissance and Modern Science; Enlightenment Age, Industrial Revolution; Technologic Development: Steam Engine, Internal Combustion Engine, Usage of Electricity, Conversion of Electrical Energy to Mechanical Energy, Telegraph and Telephones, Wireless Communication, Radio, Television, Space Travel, Vacuum Lamb Technology, Invention of Transistor and Silicon Age, Development of Computer Technology; Information Age.

LOJ 401 Logistics Management and Models 3+0 6,0
Logistics Concept; Historical Development of Logistics; Logistics Management and Supply Chain Management: Insurance, Customs; Forecasting; Facility Location Selection; Logistic Network Design; Transportation Vehicles; Types of Transportation; Warehouse Management: Warehouse Design; Types of Consolidation; Cargo Loading; Fleet Composition; Short and Long Term Vehicle Routing Problems: Modeling and Application Examples.

LOJ 401 Logistics Management and Models 3+0 6,0
Logistics Concept; Historical Development of Logistics; Logistics Management and Supply Chain Management: Insurance, Customs; Forecasting; Facility Location Selection; Logistic Network Design; Transportation Vehicles; Types of Transportation; Warehouse Management: Warehouse Design; Types of Consolidation; Cargo Loading; Fleet Composition; Short and Long Term Vehicle Routing Problems: Modeling and Application Examples.

MAT 219 Differential Equations 2+2 4,5
Differential Equations and their Solutions; First Order and First Degree Differential Equations: Exact differential equations and integrating factors, Separable and homogeneous equations, Linear equations; Applications of First Order and First Degree Differential Equations: Geometrical problems, Orthogonal trajectories, Oblique trajectories; Higher Order Linear Differential Equations and Applications; Solutions of Differential Equations by Laplace Transform; Linear Systems of Differential Equations.

MAT 219 Differential Equations 2+2 4,5
Differential Equations and their Solutions; First Order and First Degree Differential Equations: Exact differential equations and integrating factors, Separable and homogeneous equations, Linear equations; Applications of First Order and First Degree Differential Equations: Geometrical problems, Orthogonal trajectories, Oblique trajectories; Higher Order Linear Differential Equations and Applications; Solutions of Differential Equations by Laplace Transform; Linear Systems of Differential Equations.

MAT 247 Engineering Mathematics (Mühendislik Matematiği) 4+0 7,0
Multivariable Calculus: Rotation of coordinate axes, Scalar or dot product, Vector or cross product, Gradients, Divergence of vector field, Curl of a vector field, Vector Integration, Line integrals Multiple integrals, Arc length, Surface area, Volume calculation, Cylindrical coordinates, Spherical coordinates, Gauss' Theorem, Stokes' Theorem; Complex Calculus, Complex algebra, Cauchy-Riemann conditions, Cauchy's integral theorem, Singularities, Calculus of residue, Mapping, Conformal Mapping; Introduction to Optimization, Unconstrained optimization, Linear programming, Linear programming problems, Constrained optimization, Lagrange multipliers, Second-order conditions.

MAT 249 Linear Algebra and Differential Equations 3+0 4,5
Vectors in the Plane and Spaces: Vector Spaces, Subspaces; Linear dependence & Independence, Basis & Dimension; Linear Transformations; Matrices & Determinants, Eigenvalue and Eigenvector Theory; Diagonalizing Linear Transformations; Inner Product Spaces; Systems of Linear Equations: First and second order linear differential equations, n-th order linear differential equations, Method of undetermined coefficient.

MAT 251 Linear Algebra 3+0 4,5
Preliminaries: Binary operations and algebraic structures; Matrices and Systems of Linear Equations: Matrices, Arithmetics of matrices, Systems of linear equations and their solutions by matrices; Determinants and their Applications; Vector Spaces: Vectors in plane and in 3-space, Vector spaces and subspaces, Linear dependence, Linear independence and base; Inner Product Spaces; Linear Transformations; Eigenvalues and Eigenvectors: Diagonalization, Symmetric and Hermitian transformations, Quadratic forms.

MAT 805 Calculus I 4+2 7,5
Introduction to calculus, limits and contiuity, Differentiation and taking derivatives, Transcendental and inverse functions, Complex numbers, Applications of derivatives, Integration, Integral techniques, Applications of integrals.

MAT 805 Calculus I 4+2 7,5
Introduction to calculus, limits and contiuity, Differentiation and taking derivatives, Transcendental and inverse functions, Complex numbers, Applications of derivatives, Integration, Integral techniques, Applications of integrals.

MAT 806 Calculus II 4+2 7,5
Conics, Parametric and polar curves, Sequencpes, Series, Power series, Vectors, Vector functions and curves, Partial differentiation, Partial differentiation applications, Multiple integrals, Vector fields, Vector calculus.

MAT 806 Calculus II 4+2 7,5
Conics, Parametric and polar curves, Sequencpes, Series, Power series, Vectors, Vector functions and curves, Partial differentiation, Partial differentiation applications, Multiple integrals, Vector fields, Vector calculus.

MEK 201 Statics 3+0 5,0
Definition of the Mechanics and Introduction; Static of Particles: Principles and the problems; Force Systems in a Plane; Static of Rigid Bodies: Equivalent systems, Equilibrium of rigid bodies; Trusses; Method of joints, Method of sections; Space Force System; Distributed Loads; Centre of Gravity; Analysis of Structures; Forces in Beams and Cables; Distributed Loads: Moment of inertia; method of Virtual Work; Friction.

MEK 206 Dynamics 3+0 4,5
Definition and Introduction; Kinematics of a Particle; Kinetics of a Particle: Newton's second law, Impulse and momentum; Work-Force Area; Potential and Kinetic Energy; Vibration; System of Particles; Motion of Particles with Variable Mass; Kinetics of a Rigid Body; Euler Angles; Centre of Gravity Theorems; Eccentric Rotation and Plane Motion; Relative Motion.

MEK 212 Strength of Materials I 3+2 6,0
General Definitions and Principles of Mechanics; Definition of Stress and Strain; Mechanical Properties of Materials; Linear Elasticity and Hook?s Law; Statically Indeterminate Structures under Axial Load; Torsion: General Torsion Formulas for Circular Cross-Sections, Statically Indeterminate Systems under Torque; Bending: Internal Force Diagrams, Bending Stresses, Composite Cross-Sections; Transverse Shear; Stress and Strain Transformation: General Principles of Transformation, Use of Mohr Circle; Combined Loading of Axial Load Moment, Shear and Torsion; Elastic Curve of Beams.

MEK 215 Statics and Strength of Materials 3+0 4,5
Introduction to the General Principles of Mechanics: Idealizations, Units, Significant Figures, Newton's Laws; Force Vectors and Force System Resultants; Equilibrium of Particles and Rigid bodies; Structural Analysis; Method of Sections; Method of Joints; Frames and Machines; Internal Forces; Shear and Moment Diagrams; Concepts of Stress and Strain; Axial Loading and Deformation; Thermal Stresses; Factor of Safety.

MEK 216 Engineering Mechanics: Dynamics 3+0 4,0
Newton's Laws of Motion; Unit systems, Kinetics of particles, Applying the laws of motion to Cartesian, Cylindrical and spherical coordinates, Definitions of force-mass-momentum, Work and energy, Function of forces and potential energy, Impulse-momentum, Collision, Kinematics of rigid bodies, rotation around a fixed axis and general planar motion, Mechanical vibrations, Practice and problem solutions.

MEK 217 Engineering Mechanics: Statics 3+0 5,0
Vector Algebra; Forces and Moments; Equivalent Force Systems in Rigid Bodies; Free Body Diagram; Equilibrium; Center of Gravity; Distributed Forces; Introduction to Structural Mechanics; Planar Truss Systems; Frames and Machines; Internal Forces in Structural Members; Joint Points and Cutting Method; Shear and Bending Moment Diagrams; Moment of Inertia; Friction; Principle of Virtual Work.

MEK 307 Fluid Mechanics 3+0 4,5
Fundamental Concepts: Pressure, Liquids with Different inherent weight and liquids in realtive balance, Static of fluids, Kinematics of fluids; Fundamental Equations of One-Dimension Flows: Continuity equation and Bernoulli equation; Theorem of Impulse-Momentum; One Dimension Flows of Ideal Fluids; One Dimension Flows of Real Fluids; Two-Dimension Flows of Ideal Fluids; Two-Dimension Flows of Real Fluids; Uniform Flow in Open Channels; Gradually Varied Flow in Open Channels.

MEK 307 Fluid Mechanics 3+0 4,5
Fundamental Concepts: Pressure, Liquids with Different inherent weight and liquids in realtive balance, Static of fluids, Kinematics of fluids; Fundamental Equations of One-Dimension Flows: Continuity equation and Bernoulli equation; Theorem of Impulse-Momentum; One Dimension Flows of Ideal Fluids; One Dimension Flows of Real Fluids; Two-Dimension Flows of Ideal Fluids; Two-Dimension Flows of Real Fluids; Uniform Flow in Open Channels; Gradually Varied Flow in Open Channels.

MEK 311 Strength of Materials 4+0 6,0
Introduction and Basic Concepts; Stress; Strain; Relations between Stress and Deformation (Hooke Law); Yielding and Failure Criteria; Mohr's Circle; Area Moments; Axial Loading; Torsional Stress; Simple Bending and Biaxial Bending; Torsion; Shear Force and Bending Moment Diagrams; Stress in Beams; Deflection in Beams and Elastic Curves; Hypotheses for Failure.

MEK 315 Fluid Mechanics 3+2 6,0
Basic Concepts: Unit systems, Mechanical energy balance; Fluid Mechanics: Fluid static and its applications; Basic Equations of Fluid Flow; Flow of Incompressible Fluids in Conduits and Thin Layers; Flow of Compressible Fluids; Flow of Fluids Through Fixed Beds; Transportation of Fluids and measuring Flow Speed; Agitation and Mixing of Liquids.

MEK 317 Fluid Mechanics 4+0 5,0
Basic Concepts: Unit Systems, Mechanical energy balances; Fluid mechanics: Fluis static and its applications; Basic Equations of Fluid Flow; Flow of Incompressible Fluids in Conduits and Thin Layers; Flow of compressible Fluids; Flow of Fluids Through Fi, xed Beds; Transportation of Fluids and measuring Flow Speedf; Agitation and mixing of Liquids.

MEK 317 Fluid Mechanics 4+0 5,0
Basic Concepts: Unit Systems, Mechanical energy balances; Fluid mechanics: Fluis static and its applications; Basic Equations of Fluid Flow; Flow of Incompressible Fluids in Conduits and Thin Layers; Flow of compressible Fluids; Flow of Fluids Through Fi, xed Beds; Transportation of Fluids and measuring Flow Speedf; Agitation and mixing of Liquids.

MEK 403 Strength of Materials II 3+0 4,5
Three Dimensional Stress Analysis; Bending with Shear; Shear Centre; Investigation of Elastic Curve by Different Methods: Effect of shear; Normal Force and Bending: Nucleus, Materials not resisting tension, Second rank theory; Torsion with Bending; Virtual Work Theorem: Betti's and Castigliano's-theorems; Principles of Minimum; Elastic Stability: Euler conditions, Torsion outside elastic zone; Approximate Methods, Rayleigh Ratio.

MEK 404 Applied Fluid Mechanics 2+2 5,0
Fundamental Concepts of Fluid Dynamics; Conservation Laws; Mathematical Models; Mathematical Classification of Flows; Components of Numerical Solutions; Introduction to Finite Differences; Concepts of Finite Differences; Introduction to Finite Volumes; Concepts of Finite Volumes; Introduction to Finite Elements; Concepts of Finite Elements; Iteration Methods; Examples; Lanimar Flows; Examples; Turbulent Flows.

MEK 405 Applied Strength of Materials 3+0 5,0
Analysis of Stress; Definition of Strain; Stress and Strain Relations; Strain Energy and its Components; Airy Stress Function; Solution of Simple Elasticity Problems; Yield Criteria; Bending Moments of Inertia in Beams; Bending and Elementary Theory of Bending in Beams; Theory of Torsion of Circular Bars; Torsion Membrane Analogy; Castigliano's Theorem; Principle of Minimum Potential Energy; Plastic Behavior of Materials.

MEK 406 Mechanical Vibrations 3+0 5,0
Kinematics of Vibration, Single-degree of freedom systems, Undamped free vibrations, Determining natural frequencies via energy method, Rayleigh method, Damped free vibrations, Viscous damped vibrations, Logarithmic decrement, Forced damped vibrations, Vibration isolation, Two degree of freedom systems, Dynamic vibration absorber, Multi-degree of freedom systems, Torsional vibrations.

MEK 439 Thermal System Design 2+2 5,0
Concepts of Thermal System Design; Mathematical Modeling; Optimization Methods; Fans, Pumps, Heat exchangers, Nozzles and diffusors, Pipe flow; Steady-state Simulations of Complex Thermal Systems; Applications of the Principles of Thermodynamics, Heat Transfer and Fluid Mechanics in Designing Thermal System and its Components; Features of the Components and their Effect on the General System Performance.

MKM 101 Technical Drawing for Mechanical Engineers 2+2 5,0
Importance of Technical Drawing and Standards in Engineering; Drawing Lines and their Meaning in Technical Drawing: Technical writing; Principles of Dimensioning and Tolerancing, Principles of Projections; Drawing of Views; Section Views; Surface finishing symbols, Machine materials symbols; Machine Assembly Drawing; Machine Elements Drawing; Welding Symbols; Dimensional tolerances; Geometric Tolerances.

MKM 102 Introduction to Mechanical Engineering 3+0 6,0
History and Emergence of Mechanical Engineering; Engineering Profession and the Place of Mechanical Engineering in It; Development of Mechanical Engineering; The General Definitions, Importance and Working Areas of Mechanical Engineering and Engineering Ethics; Basic Concepts and Subjects, Fields of Work, Qualifications and Skills of Mechanical Engineers; An Overview of the Mechanical Engineering Program at Anadolu University.

MKM 103 Technical English for Mechanical Engineers 2+0 2,0
Basics of Engineering; Main Branches of Engineering and Relations between them; Engineering Materials, Terms Related with Materials: Metals, Alloys, Thermo plastics; Grammar Revision: Active vs. Passive, Adjective vs. Adverb; Materials Technology; Metals and their Molecular Structure; Mechanisms of Deformation, Alloys, Thermoplastics, and Composites; Physical Forces and Mathematical Formulae; Chipping Machining, Cutting, Sawing, Milling, Drilling; Turbofan, and the Forces Involved; Alternative Energy, Hydroelectric Power Plants, Heat Pump, Solar Energy, Wind Power; Car Technology: Combustion, Hybrid, and Electric Car Engines.

MKM 104 Computer Aided Engineering Technical Drawing 2+2 5,0
Introduction to Computer Aided Technical Drawing; Sketch Modeling; Assigning Geometric Constraints to Sketches; Projection Drawings; General Concepts in Three Dimensional Modeling; Creating Parts in Three Dimensional Design and Solid Modeling; Dimensioning Principles; Arranging Models; Sectioning; Assembly Modeling; Machinery and Construction Parts; Creating Animations and Simulations.

MKM 220 Problem Solving Methods 3+0 4,5
Introduction to Engineering Design and Engineering Problem Solving; Engineering Problem Solving Format, Problem description, Problem classification, Problem analysis; Problem Solving Methods; TRIZ Method; 6 Sigma and Engineering; Computer Assited Problem Solving Methods; Design of Experiments; Analysis of Variable Data; ANOVA; Presentation and Reporting Methods; Complex Problem Solving Applications.

MKM 301 Theory of Machines 3+0 7,0
Mechanisms and Element pairs; Kinematic Chains; Kinematic Analysis and Synthesis of Planar Mechanisms; Dynamics of Machines; Cam Design; Gears and Gear Systems; Linkage Mechanisms; Force Analysis of Machines; Mass Balancing in the Machines; Undamped, Damped and Forced Vibrations of Single Degree of Freedom Systems; Vibration Measuring Instruments, Vibration Control and Isolation; Flywheels; Gyroscopes.

MKM 302 Machine Design I 4+0 6,0
Importance of Machine Elements in Constructional Activities; Principles of Calculations, Forming and Use of Machine Elements; Materials and Processes; Load Calculations; Stress, Strain and Deflection; Static Failure Theories; Fatigue Failure Theories; Surface Failure; Shafts, Keys and Couplings; Bearings and Lubrication; Gears; Springs; Welded Joints, Shape and force-bound shaft connections, Pins and pivot pins, Bolt joints and screw mechanisms.

MKM 303 Heat Transfer 4+0 6,5
Fundamentals of Heat Transfer; Equation of Heat Conduction; Steady-state and Transient One or Multi-dimensional Heat Conduction; Numerical Methods and Applications; Laminar, Turbulent and Forced Convection and Natural Convection; Heat Transfer during Phase Transition; Heat Exchangers and Design of Heat Exchange Systems; Heat Transfer on Extended Surfaces; Heat Transfer through Radiation.

MKM 304 Manufacturing Techniques 2+2 5,0
Introduction to Traditional and Advanced Manufacturing Processes and their Comparison; Overview, Principles and Applications of Casting and Joining Processes; Bulk Deformation Processes (Forging; Rolling and Extrusion); Sheet Metal Forming Processes, Machining, Powder Metallurgy; Surface Technologies; Coating, Classification of Non-Traditional and Micro Level Manufacturing Methods, DFX (Design for X); Engineering Economics; Engineering Metrology; Quality Engineering; Automation and Plant Layout; Computer Integrated Manufacturing; Lean Production.

MKM 306 Experimental Engineering 2+2 4,0
Introduction to Experimental Methods; Measurement Systems and their Basic Elements; Data Collection Systems; Filters and Amplifiers; Length Measurements; Temperature Measurements; Pressure Measurements; Stress Measurements, Optical Measurements, Preparation of experimental setup and measurement chain; Introduction to Statistics; Signal Quality and Data Processes, Signal processing and Evaluation of Data Analysis, Signal processing methods; Fourier Transform and Frequency Analysis; Uncertainty Analysis.

MKM 339 Introduction to Finite Elementh Method 2+2 5,0
Introduction to the Fundamentals of Finite Element Method (FEM), Static Models, Formulation Methods, Ritz and Rayleigh-Ritz Method; Variational and Incremental Methods; Application of FEM to Rayleigh-Ritz and Galerkin Methods; One and Two Dimensional Elements, Springs and Truss Elements; Beam Elements; Plane Stress and Plane Strain Elements; Finite Elements and Interpolation Functions; Elastostatic Problems, Heat Transfer Problems, Mass Matrices, Time Integration, Plate Formulations, Locking Problem, Convergence Criteria.

MKM 401 Machine Design II 4+0 6,0
Shaping of Shafts and Axes, Deformation and calculation of vibrations; Description of Roller Bearings, Determination of bearing dimensions and bearing life at static and dynamic loads; Description of Journal Bearing, Determination of capability of carrying load and bearing heat; Gears, Description of Gear Wheel Mechanisms, Calculation and sizing of strength; Description, selection, sizing, calculation methods and standards of belt-pulley mechanisms.

MKM 403 Mechanical Engineering Design I 2+2 5,0
Introduction to the Fundamental Mechanical Engineering Fields: Materials, Automotive, Energy machines, Robotics and system control; General Machine Design; Selection of the Design Project based on Fundamental Mechanical Engineering Fields; Studies about the Selected Design Project: System analysis, Conceptual design, Predesign; Detailed Design: Dimensioning, Strength of materials calculations and engineering analyses; Documentation of Project Design Studies: Documentation and oral presentation of numerical or experimental analyses at the end of the semester.

MKM 404 Mechanical Engineering Design II 2+4 5,0
Introduction to the Current Studies on Fundamental Mechanical Engineering Research Fields; Materials, Automotive, Energy machines, Robotics and system control; Selection of the Design Project on Fundamental Mechanical Engineering Fields; Studies on Selected Project: Literature review, System analysis, Conceptual design, Predesign; Research Project Selection; Determination of the Theoretical, Modeling and/or Experimental Stages of the Research; Detailed Design of the Research Project: Determining the steps of the theoretical and/or experimental studies; Documentation of the Research Studies: Documentation and oral presentation of the numerical and/or experimental analyses at the end of the semester.

MKM 437 Engineering Materials 3+0 5,0
Introduction to Engineering Materials; Mechanical and Physical Properties of Materials; Engineering Metals and Alloys; Micro Structure of Metals; Phase Diagrams of Ferrous Alloys; Engineering Plastics; Engineering Ceramics; Composite Materials; Nano Materials; Semi-conductives; Destructive and Non-destructive Testing of Materials; Selection and Development of Materials; Tables on Material Selection; Advanced Materials, Foam Materials; Design with Materials; Engineering Faults and Accidents.

MKM 440 Introduction to Computer Aided Manufacturing 2+2 5,0
Basic Knowledge about Computer Aided Manufacturing in the Design Process; Creation of Tool Path in Turning and Milling Process; Selection of Appropriate Tool and Cutting Parameters; Creation of Tool Path for 3D Parts, Formation of M and G Codes for CNC Machines; Three Dimensional CAD Modeling; Feature-Based Modeling; Variational and Parametric Modeling; Tools for PLC Logic Design; Kinematics of NC Machines; Fundamentals of Industrial Control; Rapid Prototyping.

MLZ 103 Materials in Practice 2+0 2,5
Importance of Materials Science; Materials Application Areas; Materials in Sport, Materials in Racing Cars, Materials in Aircrafts, Medical Materials; Special Examples from Daily used Materials; Shape Memory Alloys, Superconductors, Cutting Tools, Electronic Devices.

MLZ 110 Structure of Materials 2+1 3,5
Meaning of Crystallography; Importance of Crystallography; Atoms and Atomic Bonds; Structure of Crystals; Packing Identical Atoms in Two Dimensions; Unit Cell; Planar Lattices; Symmetry; Symmetry Operations and Symmetry Groups; Packing in Three Dimensions; Cubic Close Packing and Hexagonal Close Packing; Construction of Bravais Lattices from Planar Lattices; Crystal Systems; Interstices in Close Packed Arrays; Structures Based on Filling of Interstices; Packing of Non-identical Atoms; Ionic and Covalent Crystals, Coordination Numbers; Planes (Miller indices), Directions and Zone Law (Weiss zone law); Indexing of Hexagonal and Trigonal Systems (Weber and Miller-Bravais Indices); Projections of Crystal Structure; Plane Spacings and Angles Between Planes; Three Dimensional Symmetry.

MLZ 203 Materials Science 3+0 3,5
Atomic Structure; Arrangement of the Atoms; Structural Defects: Point defects, Dislocations, Planar defects; Mechanical Tests and Properties: Tension, Compression, Impact test, Hardness, Fatigue; Deformation of the Materials; Metolography: Preparation of the samples, Observation with optic and electron microscope; Treatment Increasing the Strength of the Materials; Solidifying and Cooling Curves, Phase Diagrams; Iron Alloys: Steels, Cast Irons, Heat treatments; Metals and Alloys Excluding Iron: Aluminium, Titanium, Copper alloys.

MLZ 203 Materials Science 3+0 3,5
Atomic Structure; Arrangement of the Atoms; Structural Defects: Point defects, Dislocations, Planar defects; Mechanical Tests and Properties: Tension, Compression, Impact test, Hardness, Fatigue; Deformation of the Materials; Metolography: Preparation of the samples, Observation with optic and electron microscope; Treatment Increasing the Strength of the Materials; Solidifying and Cooling Curves, Phase Diagrams; Iron Alloys: Steels, Cast Irons, Heat treatments; Metals and Alloys Excluding Iron: Aluminium, Titanium, Copper alloys.

MLZ 204 Materials of Construction 3+2 5,0
Cementation Materials; Lime, Cement, Puzzolans; Physical and Mechanical Properties; Aggregates: Properties, Experiments; Factors Affecting the Strength of the Concrete; Properties of Fresh Concrete; Calculation of Concrete Mix; Production and Curing of the Concrete; Reinforcement Steels and Properties; Metals and Alloys; Other Alloys Used in Structures; Glasses; Plastic Based Materials; Wood.

MLZ 204 Materials of Construction 3+2 5,0
Cementation Materials; Lime, Cement, Puzzolans; Physical and Mechanical Properties; Aggregates: Properties, Experiments; Factors Affecting the Strength of the Concrete; Properties of Fresh Concrete; Calculation of Concrete Mix; Production and Curing of the Concrete; Reinforcement Steels and Properties; Metals and Alloys; Other Alloys Used in Structures; Glasses; Plastic Based Materials; Wood.

MLZ 210 Raw Materials and Unit Operations 3+0 4,5
Processing of Ores Concentrates, Recycled and Partially Processed Raw Materials to Render them Amenable to further Metallurgical Treatment; Process Flowsheets and Details of Physical and Chemical Separation Methods for the Concentration of Raw Materials; Principles and Applications of Mineral Processing; Pretreatment Processes; Drying, Calcinations, Roasting and Agglomeration.

MLZ 213 Physical Properties of Materials 3+0 5,0
Introduction to Materials Science and Engineering; Atomic Structure and Chemical Bonding; Crystal Structures; Solidification, Crystalline Imperfections and Diffusion in Solids; Mechanical Properties of Metals; Polymeric Materials; Phase Diagrams; Engineering Alloys; Ceramic Materials; Composite Materials; Corrosion; Electrical Properties of Materials; Optical Properties; Superconducting Materials; Magnetic Materials.

MLZ 222 Materials Characterization Techniques Laboratory 0+2 3,0
Specimen Preparation Laboratory; Optical Microscope Laboratory; Scanning Electron Microscope Laboratory; Microanalysis Techniques Laboratory; Atomic Force Microscope Laboratory; X-ray Diffraction Laboratory; X-ray Fluorescence Laboratory; Thermal Analysis Laboratory.

MLZ 224 Materials Thermodynamics I 3+1 4,5
Basic Definitions; First Law of Thermodynamics: Work, Heat, Reversible Processes, Process Types, Heat Capacity; Second Law of Thermodynamics: Entropy and Irreversibility, Carnot Cycle, Combined Statement of the First and Second Laws; Auxiliary Functions; Enthalpy and Entropy as a Function of Temperature and Pressure; Third Law of Thermodynamics; Gibbs Free Energy as a Function of Temperature and Pressure; Clapeyron and Clausius-Clapeyron Equation.

MLZ 229 Materials Characterization Techniques I 2+0 2,0
Importance of Characterization; Properties and Production of X-rays; Interaction between X-Rays and Solid; Bragg Law and Diffraction; The Use of X-Rays; Intensity of Diffracted Peaks; Calculation of Expected Theoretical Patterns; The Identification of Phases Obtained from Different Materials; Heat-Solid Interactions; Thermal Analysis Techniques; Properties Measured by Thermal Analysis; Thermogravimetric Analysis (TG); Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC) and Simultaneous Thermal Analysis; Dilatometry; Interpretation of TG, DTA, DSC and Dilatometer Curves; Parameters Effecting the Thermal Analysis Results; Quantitative Analysis.

MLZ 230 Materials Characterization Techniques II 2+0 3,5
Importance of Microstructure; Microscopic Characterization Techniques; Brief History of Microscopes; Specimen Preparation; Light-Solid Interactions and the Resulting Signals; Light Microscopes, Types of Light Microscopes and

Contrast Techniques; Resolution, Aberrations and Why We Need to Use Electron Microscopes; Interactions Between Electrons and Solids; Light vs Electrons; Scanning Electron Microscopes (SEM); Imaging Techniques in SEM; Chemical Analysis Techniques for SEM; Qualitative and Quantitative Analysis; Important Parameters to Obtain Best Results; Transmission Electron Microscopy (TEM) and Imaging Techniques; Diffraction and Chemical Analysis in TEM.

MLZ 305 Materials Processing Laboratory I 0+4 4,5
Characterisation of Ceramic Powders: Particle Size Analysis, Density Measurements; Traditional Ceramic Processes: Wall and floor tiles production, Sanitaryware production, Porcelain production; Frits and Glazes; Advanced Structural Ceramics; Electroceramics.

MLZ 306 Materials Processing Laboratory II 0+4 3,0
Strain Gages; Tensile Test; High Temperature Tensile Test; Bending Test; Impact Test; Hardness Test; Compression Test; Creep Test; Fatigue Test; Fracture Toughness Test.

MLZ 307 Phase Diagrams 3+0 4,5
Thermodynamic and Phase Equilibria; One Component System Phase Diagrams; Two Component System Phase Diagrams: Binary eutectic, Intermediate compounds, Solid solution, Liquid immiscibility; Determination of Phase Diagrams: Experimental methods, Thermodynamic estimations and calculations; Ternary Systems: Method of determining composition, Isoplethal studies in ternary systems, Binary and ternary intermediate compounds, Solid solutions; Four and Six Component Systems.

MLZ 308 Mechanical Behavior of Materials 3+0 4,0
Atomic Bonding and Crystal Structure; Elastic Behaviour in Crystal Structures; Tensors; Fundamentals of Fracture Mechanics; Fracture Strength of Materials; Plastic Deformation in Crystal Structures; Viscosity and Viscoelasticity; Creep Deformation; Mechanical Behaviour and Measurements; Strengthening and Toughening of Materials; Thermal Behaviour of Materials; Analysis of Mechanical Failure; Strength and Engineering Design.

MLZ 309 Ceramics Processing 3+0 4,5
Ceramic Powders: Definitions, Properties, Requirements; Ceramic Raw Materials: Common raw materials, Special inorganic chemicals; Ceramic Characterisation: Specifications, Particle size, Surface area, Pore structure, Density; Grinding: Communition equipment and their performance; Granulation: Spray drying; Powder Packing; Surface Energy: Laplace and Kelvin equations, Parameters controlling surface energy, Wetting, Solid-solid, Solid-liquid and Solid-gas interfaces; Processing Additives: Liquids, Surfactants, Deflocculants and coagulants; Colloids: Classification, Stability of colloidal suspensions; Importance of Interfaces; Charged Interfaces and Electric Double Layer; DLVO Theory; Deflocculation of Clays; Rheological Properties and Measurements; Shaping Methods: Slip casting, Dry and Isostatic pressing, Plastic shaping; Drying; Sintering: Solid state sintering, Liquid phase sintering, Vitrification; Sintering Furnaces.

MLZ 310 Thermochemistry of Materials 3+0 4,0
The Theoretical Basis: Thermodynamics, Solution thermodynamics; Calculation of Thermochemical Data: Heat capacity, Transformation, Melting, Evaporation enthalpies and entropies, Enthalpy and entropy changes, Formation enthalpies; Chemical Equilibrium; Reaction Kinetics; Examples of Thermochemical Treatment on Ceramics; Stability and Production of Ceramics; Chemical Vapour Deposition (CVD) and Physical Vapour Deposition (PVD) Process.

MLZ 311 Non-crystalline Materials 3+0 3,5
Introduction; Difference Between Crystalline and Non-crystalline Materials; Glass Formation; Models of Glass Structure; The Structure of Oxide Glasses; Vitrification; Submicrostructural Features of Glasses; Diffusion in Glasses; Composition as a Variable, Heat Flow and Precipitation; Stress Relieving; Colloidal Colours, Photosensitive Glasses and Photocromic Glasses; Phase Separation in Glasses; General Properties of Non-crystalline Materials; Their Interaction with Other Materials.

MLZ 312 Whitewares 3+0 4,0
Traditional Ceramic Raw Materials: Clay, Quartz, Feldspar and other raw materials; Their Role in a Whiteware Body and Physical and Chemical Changes under Firing; Wall and Floor Tile Bodies and their Manufacturing Methods; Vitrified Bodies and their Manufacturing Processes; Porcelain Bodies and their Manufacturing Processes; Frit Manufacture and Glaze Preparation; Glaze and Decoration Application Techniques; Drying and Firing Systems.

MLZ 314 Transport Phenomena in Materials Processing 4+0 6,0
Introduction to Transport Phenomena: Momentum transfer, Heat transfer and mass transfer; Applications of Transport Phenomena in Material Processing; Fluid Flow in Materials Processing: Crystal growth, Fiber processing, Continuous casting; Heat Transfer in Material Processing: Powder processing, Die casting, Welding; Mass Transfer in Material Processing: Crystal growth, Casting, Semiconductor device fabrication.

MLZ 318 Metallic Materials 4+0 4,5
Fe-Fe3C equilibrium phase diagram; Heat Treatment of Steels; Time-Temperature-Transformation Diagrams; Alloy Steels; Tool Steels; Standard Designation of Iron Base Alloys; D.I.N Standards; AISI/SAE Standards; White, Gray, Tempered and Nodular Cast Irons; Nonferrous Metals and Alloys; Copper and its Alloys; Aluminum and its Alloys; Nickel and its Alloys; Titanium and its Alloys.

MLZ 320 Glass Technology 3+0 4,0
Introduction to Glass Science; Different Types of Glasses: Pure silica glass, Alkali-silicate glasses, Soda-lime-silica glasses, Lead based glasses, Borosilicate glasses, Alumina-silicate glasses, Phosphate glasses, Halogen based glasses, Chalcogenide glasses; Theories for Glass Formation; Raw Materials and Their Properties; Glass Batch Calculations; Physical and Chemical Properties of Glass; Optical

Properties of Glass; Chemical Durability of Glass; Glass Formation Techniques; Heat Treatment of Glass; Applications of Glass.

MLZ 321 Materials and Energy Balance 2+2 4,0
Stoichiometric Principles; Charge Calculations and Material Balances; Heat Balance; Choice of Reactions; Application of Thermochemical Principles; Examples of Material and Heat Balances in Selected Processes.

MLZ 322 Fundamentals of Semiconductors 3+0 4,0
Basics of Semiconductors; Insulators; Conductors and Semiconductors; Band Theory; Direct Band and Indirect Band Materials Growth Techniques; Silicon Crystal Growth; Czochralski Technique; Epitaxial Growth Techniques; Chemical Vapor Deposition (CVD); Molecular Beam Epitaxy (MBE); Physical Deposition Techniques; Characterization Techniques; Optical Characterization; Electrical Characterization; Applications; Semiconductor Devices; Transistors; Photonic Devices; Basic Fabrication Steps of Oxidation; Photolithography and Etching; Diffusion and Ion Implantation; Metallization.

MLZ 323 Solid State Physics in Materials Science 3+0 4,0
Crystal Lattices and Reciprocal Lattice; Lattice Dynamics, Phonon Statistics and Lattice Specific Heats; Heat and Ionic Conductivity; Conductivity and Dynamics of Electrons in Metals and Semiconductors; Free and Semi-Free Electron Models; Band Theory; Fermi Surfaces; Dielectric and Ferroelectrics; Electronic Interactions and Magnetic Properties; Magnetic Structures and Ordering; Electron Interactions and Magnetic Structure; Diamagnetism and Paramagnetism; Ferromagnetic, Antiferromagnetic and Multiferroic Systems; Magneto-electric Effects; Magneto-strictive Effects and Crystal Lattice Interactions; Optics and Magneto-optic Effects; Superconductivity; Surface and Interface Physics; Sensor Technologies and Application Areas.

MLZ 324 Instrumental Analysis 3+0 4,0
Characteristics of Electromagnetic Radiation; Instruments of Optical Spectroscopy; Introduction to Molecular ultraviolet/ Visible and Near-infrared Absorption Spectroscopy; Application of Molecular Ultraviolet/ Visible Absorption Spectroscopy; Atomic Absorption Spectroscopy; Infrared Absorption Spectroscopy; Nuclear Magnetic Resonance Spectroscopy; Mass Spectroscopy; Thermal Methods; Introduction to Chromatographic Separations; Gas Chromatography; High Performance Chromatography.

MLZ 325 Materials Thermodynamics II 3+1 4,5
Ideal Gases and Mixtures of Ideal Gases; Chemical Potential; Solution Behaviors: Integral Properties, Partial Properties, Raoult's and Henry's Law, Activity, Gibbs-Duhem Equation, Alpha Function, Ideal Solutions, Regular Solutions, Excess Properties, Statistical Model; Gibbs Free Energy-Composition and Binary Phase Diagrams: Reference and Standard States; Reactions Involving Gases: Effect of Temperature and Pressure on the Equilibrium Constant; Reactions Involving Pure Condensed Phases and a Gaseous Phase: Ellingham Diagrams, Phase Transformations, Oxides of Carbon.

MLZ 403 Processing of Polymers 3+0 4,5
Introduction to the Science of Large Molecules; Polymerization; Step-Reaction (condensation) Polymerization, Radical Chain (addition) Polymerization, Ionic and Coordination Chain (addition) Polymerization, Copolymerization, Polymerization Conditions and Polymer Reactions, Characterization; Polymer Solutions, Measurement of Molecular Weight and Size, Analysis and Testing of Polymers, Structure and Properties; Morphology and Order in Crystalline Polymers, Rheology and the Mechanical Properties of Polymers, Polymer Structure and Physical Properties, Properties of Commercial Polymers; Hydrocarbon Plastics and Elastomers, Other Carbon-Chain Polymers, Heterochain Thermoplastics, Thermosetting Resins, Polymer Processing; Plastics Technology, Fiber Technology, Elastomer Technology.

MLZ 405 Electrical, Magnetic and Optical Properties of Materials 3+0 4,0
Electrical Properties of Materials; Conduction Mechanisms; Semiconductor Materials and Devices; Dielectric Materials and Devices: Capacitor materials; Ceramic sensors; Optical Properties of Materials: Light and the electromagnetic spectrum, Refraction, Absorption, Transmission and Reflection of Light, Luminescence; Superconducting Materials; Magnetic Materials: Magnetism, Types of magnetism, Ferromagnetic domains, Soft magnetic materials, Hard magnetic materials, Ferrites.

MLZ 407 Seminar 0+2 2,5
Students select a subject in one of the fields of materials science and engineering. They prepare a presentation for academic staff and other students of intensive literature survey.

MLZ 408 Joining of Materials 3+0 4,0
Importance of Joining; Mechanisms and Parameters for Adhesion and Joining; Requirements; Wetting and Adherence; Wetting Applications and Contact Angles; Solid State Bonding; Direct Bonding; Diffusion Bonding; Joining Processes and Materials; Ceramic-to-Ceramic Joining; Ceramic-to-Metal Joining; Solid Phase Joining Processes; Liquid Phase Joining; Braze Filler Metals and Coatings; Capacitor Discharge Joining; Miscellaneous; Physico-Chemical Aspects of Ceramic-Metal Joining; Design Considerations in Mechanical and Nondestructive Testing; Bond Strength of Ceramic-Metal Joints; Industrial Applications; Future Potentials for Joining.

MLZ 409 Tile and Brick 3+0 4,0
Definition of Structural Ceramics, Its Importance and classification; Raw Materials: Storage of raw materials, Preparation of raw materials; Processing of Structural Ceramics: Shaping, Surface treatment, Cutting, Drying, Firing, Final product finishing, Test analysis on structural

ceramics; Quality Control Standards of Structural Ceramics, Turkish Structural Ceramics Industry.

MLZ 410 Biomaterials 3+0 4,0
Introduction to Biomaterials; Bioceramics: Ceramic implant materials, Alumina and zirconia, Calcium phosphate, Hydroxyapatite, Glass-ceramics; Biometal; Metallic Implant Materials: Stainless steels, Ti and Ti-based alloys, Dental metals, Dental amalgam, Nickel-titanium alloys; Biopolimer; Polymeric Implant Materials; Polyamides, Polyethylene, Polypropylene, Polyacrylates, Flurocarbon Polymers; Composite Biomaterials: Mechanics of composites, Applications of composite biomaterials; Type of Tissues; Tissue Response to Implants; Soft Tissue Replacement; Hard Tissue Replacement.

MLZ 412 Technical Glasses 3+0 4,0
Nature of Glass; Properties of Technical Glasses; Chemically Resistant Glasses; Heat Resistant Glasses; Sial Glass; Pyrex Type Glasses; Vycor; Instrument Glasses; Neutral Glasses; The Glass Electrode; Thermometer Glasses; Glasses for Sealing Applications; Glasses for Discharge Lamps; Glasses Used in Electronic Applications; Low Dielectric Loss Glasses; Glasses Resistant to Metallic Vapours; Intermediate Glasses; Hard Glasses; Eutectic Glasses; Glasses for Combustion Tubes; Fibre Glasses.

MLZ 413 Powder Metallurgy 3+0 4,0
Principles of the P/M Process; Powder Characterization, Properties of Metal Powders and their Testing; Methods of Metal Powder Production; Precompaction Powder Handling; Compaction Processes; Densification Mechanisms; Sintering Theory; Liquid Phase and Activated Sintering; Sintering Atmospheres and Furnaces; Full Density Processing; Finishing Operations; Compact Characterization.

MLZ 414 Special Topics in Quality Control 3+0 4,0
On-Line Versus Off-Line Quality Control; Design of Experiments; Full and Fractional Factorial Design; Yates Algorithms; Taguchi Methods in Robust Design; Failure Mode and Effects Analysis; Quality Function Deployment; Introduction to Reliability Analysis.

MLZ 415 Materials Industry and Environment 3+0 4,0
Fundamentals of Environmental Quality and Management; Materials Industry and Pollutants; Air Pollution caused by Materials Industry and Its Control; Water Pollution caused by Materials Industry and Its Control; Solid Wastes caused by Materials Industry and Their Control; Reuse of Wastes; National and International Regulations; concerning Materials Industry Environmental Management System and ISO14000; Applications in Ceramics Sector; Industrial Hygiene in Materials Industry.

MLZ 416 Cement and Concrete 3+0 4,0
Definition of Cement; Cement Production; Furnace Reactions; Composition of Clinker; Bogue Formulas; Effects of Cement Production Process Parameters on the Properties of Final Product; Hydration; Hardening and Its Certain Crystal Phases and Their Interactions with Each Other; Standard Cement Experiments; General Properties of Cement; Definition of Concrete; Aggregates for Concrete; General Properties of Concrete; Special Concretes.

MLZ 417 Refractories 3+0 4,0
What is a Refractory Material?; Classification and Properties of Refractories; Refractoriness; Refractoriness-Under-Load; Creep; Volume Stability at High Temperatures; Thermal Shock Resistance; Slag Resistance; Density and Porosity; Permeability; Mechanical Strength and Young's Modulus; Chemical and Mineral Compositions and Changes in Service; Shape and Size Tolerance; Thermal Conductivity; Microstructural Examinations; Raw Materials of Refractories; How Refractories are Made?; Silicon-Based Refractories; Carbides, Borides and Nitrides; Aluminum, Zirconium and Chromium Refractories; Basic Refractories; Other Refractory Compositions; Cements, Concretes and Castable Refractories; Furnace Linings; Insulation; Fields Used.

MLZ 419 Chemical Metallurgy 3+0 4,0
Thermodynamic of Chemical Reactions; Kinetics of Chemical Reactions; Effects of Concentration and Temperature on Rates of Chemical Reactions; Generalized Treatment of Thermodynamic; Kinetic Principles of Pretreatment, Reduction, Smelting, Matter Smelting, Refining, Hydrometallurgical and Electrometallurgical Processes with Selected Examples on the Metallurgy of Copper, Zinc, Lead, Iron and Aluminum.

MLZ 420 Chemistry of Polymers 3+0 4,0
Polymer and Concepts of Polymer; Classification of Polymers and Polymerization Reactions; Structure of Polymers; Conformation and Configuration in Polymers; Thermal Processing in Polymers; Molecular Weight and Molecular-Weight Distribution; Polymer Solutions and Gel State; Mechanical Properties of Polymers; Polymer Processing; Polymerization Systems; Usage of Polymers; Industrial Applications of Polymers.

MLZ 421 Chemical Processing of Advanced Technology Ceramics 3+0 4,0
Precursor Chemistry; Powder Synthesis and Characterization; Colloid Interface Science for Ceramic Powder Processing; Ceramic Particles in Nonaqueous Media; Sol-Gel Processing; Ceramics via Polymer Chemistry; Processing of Specialty Ceramics (e.g., Lead-Based Dielectric Materials, Magnetic Particles, Ceramic).

MLZ 422 Glazes and Enamels 3+0 4,0
Introduction to Glaze Science; Raw Materials; Glaze Additives; Frit Preparation; Glaze Production Processes; Thermal Expansion Relations between Glaze and Body; Glaze Formulations; Glaze Applications; Chemical Durability; Control Methods; Glaze Defects and Corrections; Introduction to Enamel Science; Metallic Base Materials for Enamel Preparation and Their Properties; Technologically Important Enamels; Enamel Defects and Corrections.

MLZ 423 Glass Ceramics 3+0 4,0
Introduction to Glass Ceramics; samples of Glass Ceramic Systems; Preparation of Glass Ceramic Materials; Types of Simple Phase Transformation in Glass Systems; Crystallisation Mechanisms; Bulk Crystallisation in Simple Systems; General Properties of Glass Ceramics and Comparisons with Conventionally Prepared Glass Ceramics; Properties of Commercially Available Glass Ceramics and Their Application.

MLZ 424 Casting 3+0 4,0
Solidification of Pure Metals, Solidification of Alloys; Macrostructure Development; The Rate of Solidification, Heat Transfer in Solidification; Riser Design and Placement; Gating System; Solidification Induced Stress and Strain; Casting Technology; Melting Methods and Furnaces; Mold and Core Making.

MLZ 425 Advanced Materials and Composites 3+0 4,5
MIntroduction to Advanced Materials, Processing of Advanced Ceramics, Properties and Applications of Advanced Ceramic Materials, Oxide and Non-oxide Structural Ceramics: Aluminum oxide, Zirconium dioxide, Mullite, Silicon carbide, Silicon nitride, SiAlON, Boron carbide and Boron nitride; Composites: Metal matrix composites, Polymer matrix composites and ceramic matrix composites.

MLZ 426 Ferrous Extractive Metallurgy 3+0 4,0
Blast Furnace Operations: Moving bed reduction of iron oxide, Effect of presence of coke, Effect of gangue and flux components, Slag formation; Steel Making: Steel making processes, Deoxidation.

MLZ 429 Archaeometry and Application 3+0 4,0
What is Archaeometry? Terminology of Archaeometry and Material Science, Scientific Analysis Applied to Archaeological Materials and Properties, Characterisation Techniques of Archaeological Materials, Principles of Systematic Analysis in Archaeometry Production, Technology of Antique Materials, Research and Applications on Archaeometry, Group Research Study on Application of Various Analysis Techniques in Archaeology.

MLZ 430 Materials Selection and Design 3+2 7,0
Vector Mechanics; Mechanics of Rigid Bodies; Beams; Moments of Inertia; Materials Selection and Design: Design; Types of design, Technical systems, Design process, Design tools and Material Property Data; Engineering Materials: Metals, Ceramics, Polymers, Composites; Materials Selection Charts; Selection of Material and Shape; Process Selection Charts; Term Project.

MLZ 431 Alloys 3+0 4,0
Theory of Alloying: Why and How Alloying is Done?; Phase Transformations in Alloys: Aging, Mantensitic Transformation, Formation of Secondary Phases (Intermetallics and Solid Solution Systems); The Effect of Deformation and Heat Treatment; Steels; High Temperature Alloys; Light Alloys (Al, Mg, Ti Alloys); Special Alloys (Invars, Magnetic Alloys and etc.)

MLZ 432 Rubber and Rubber Technology 3+0 4,0
Introduction; Fundamental Concepts; General Polymer Concepts; Brief History of Rubber; Evolution of Natural and Synthetic Rubbers; Types of Rubber: Natural, IR, SBR, BR, IIR, EPDM, CR, NBR, others; Compounding Materials: Design, Fillers, Plasticizers, Vulcanization and chemicals, Antidegradants, Processing aids, others; Rubber Processing and Processing Equipment: Mixing, Extrusion, Molding, Finishing; Properties of Rubber; Rubber Testing: Raw materials, Compound, Vulcanized Rubber; Engineering with Rubber: Stress-strain, Hysteresis, Viscoelasticity, Vibration, Sealing elements; Rubber Products: Tire, Belt, Rubber-to-metal part, Profile, Hose, Footwear, Cable, Membrane.

MLZ 433 Thin Film Technology 3+0 4,0
Introduction to Physics of Thin Film and Overview; Growth and Film Formation; Vacuum and Kinetic Theory of Gases; Evaporation; Sputter Deposition; General Process; Specific methods; Film Characterization Techniques; Optical Electrical Magnetic and Mechanical Properties of Thin Films.

MLZ 434 Aviation Materials 3+0 4,0
Common Aviation Materials and Alloys: Stainless Steels; Super Alloys, Titanium Alloys, Aluminium Alloys, Composite Materials; Material Properties under Tensile, Fatigue and Creep; Raw Material Production Methods and Effect of Production Methods on Material Properties: Ingot Production, Casting, Forging, Material Production Processes: Welding, Brazing, Form Operations, Heat Treatment, Material Testing: Testing at Room Temperature, Testing at High Temperature, Wear and Corrosion; Quality Control: Non-destructive and Destructive Testing Methods, Quality Insurance Systems.

MLZ 435 Degradation of Engineering Materials 3+0 4,0
Degradation Economics; Electrochemical Principles of Corrosion; Review of Thermodynamic Approach in View of Corrosion Tendency; Polarization and its Application to Corrosion Rates; Passivity; Types of Corrosion Damage; Corrosion in Various Environments; Principles of Corrosion Control; Design; Material Selection; Surface Coating; Treatment of Environment; Anodic and Cathodic Protection; Oxidation and Tarnish of Metals; High Temperature Oxidation; Degradation of Ceramics and Plastics; Corrosion of Composite Materials.

MLZ 436 Casting Technology 3+0 4,0
Novel methods for casting industry: Additives for Spherical Particles, Treatment Technology, Seeding Technology, Seeding Agents, Dyes and Application Methods; New Material Standards and Costumer Expectations in Casting Industry: Wind Energy Turbine Parts, Material Behaviour at Low Temperatures, Material Characterisation and Thermal Analysis Methods for Process Control: ATAS Applications; New Approaches in New Product Production Process: Casting Simulations; Cast Iron Family and New Members.

MLZ 437 Plasticity and Deformation Processes 3+0 3,5
Macroscopic Plasticity of Engineering Materials; Yield Criteria; Plastic Stress-Strain Relations; Strain Instability; Strain Rate and Temperature; Formability; Workability; Deformation Processing of Multiphase Materials; Control of Mechanical Properties through Deformation Conditions and Microstructural Characteristics; Annealing Furnaces Utilized in Plastic Forming Operations; Forging; Rolling; Extrusion; Wire Drawing and Pipe Production; Forming of Metallic Sheets.

MLZ 438 Friction and Wear of Engineering Materials 3+0 4,0
Surface Topography and Surfaces in Contact; Measurement of Surface Topography; Topography of Engineering Surfaces; Contact between Surfaces; Friction; Laws of Friction; Friction of Metals; Friction of Ceramic Materials; Friction of Polymers; Lubricant and Lubrication; Viscosity; Boundary Lubrication; Solid Lubrication; Sliding Wear; Testing Methods; Wear-regime Maps of Metals; Wear of Ceramics; Wear of Polymers; Wear by Hard Particles; Wear and Design; Effect of Lubrication on Sliding Wear; Selection of Materials and Surface Engineering; Surface Engineering in Tribology; Surface Modification; Materials for Bearing; Advanced Ceramics in Tribological Applications.

MLZ 439 Polymer Matrix Composites 3+0 4,0
General aspects of composite materials: Fibers and fiber architecture; Matrices; Elastic deformation of long-fiber composites; Laminates and their elastic behavior; Stress and strain in short fiber composites; Characterization of interface region between matrix and fiber; Introduction to interface formation mechanisms: Measurement of bonding strength; Strength and toughness of polymer matrix composites; Introduction to processing technologies for polymer matrix composites: Hand Lay-Up; Pre-Preg; SMC (Sheet Molding Compound); RTM (Resin Transfer Molding);VARTM (Vacuum Assisted Resin Transfer Molding); Poltrusion; Filament Winding; Recent applications of polymer matrix composites.

MLZ 440 Building Materials 3+0 4,0
Introduction to Different Types of Building Materials; Wood; Production of Wood; Physical and Mechanical Properties of Wood; Durability of Wood; Engineered Wood Products; Lime; Production of Quicklime; Properties of Lime Mortars; Hydraulic Lime; Stone; Use of Stone in Structures; Heat Insulating Materials; Comparison and Production of Heat Insulating Materials; Water Insulating Materials and their Production; Covering Materials; Comparison and Production of Covering Materials.

MLZ 441 Nano Materials and Nano Technology 3+0 4,0
Introduction to Nanomaterials and Nanotechnology; Nanometer scale; History of Nanotechnology; Examples of Nanotechnology in the Nature; Nanomaterials Synthesis, Solution-based Synthesis Methods; Carbon Nanotube Growth Techniques; Nanofabrication; Top-down and Bottom-up Approaches; Tools for Characterization of Nanomaterials; Physical and Mechanical Properties of Nanomaterials; Size-Dependent Thermal, Mechanical, Optical, Electrical and Magnetic Properties; Applications of Nanomaterials; Future of Nanomaterials; Opportunities and Challenges.

MLZ 442 Industrial Processing of Metals 3+0 4,0
Welding, Thermal, Mechanical, Thermo-Mechanical Treatment and Microstructural Evolution of Metals during Industrial Manufacturing Processes; Microstructural Engineering of Metallic Materials through Thermal and/or Mechanical Treatments in Industry; Selection of Thermal Treatment Methods, Heat Treatment and Processing Parameters in Terms of Temperature, Time and Medium with Respect to the Type of Specific Metal/Alloy Characteristics and the Targeted Properties; Shaping Technologies Involving Cold, Warm or Hot Deformation. General Casting Methods, Semi-Solid Casting, Rheocasting; Ageing, Stress Relieving, Homogenization, Softening, Dynamic and Static Recrystallization, Heat Treatments; Forging, Rolling, Deep Drawing, ECAP (Equal Channel Angular Processing/Pressing), Hydrostatic Shaping.

MLZ 443 Particle Size Control Mechanism 3+0 4,0
Fundamentals of Processing; Particle Sizing Process; Particle Sizing Techniques; Raw Material Preparation Criteria; Particle Size Reduction and Aim of Size; Crushing and Grinding Systems; Choosing a Suitable Process in View of Grinding and Bond Index Criteria; Classification of Particle Sizes; Mineral Processing and Applications; Submicron Grinding and Size Control; High Technology Grinding Processes.

MLZ 444 Welding Technologies 3+0 4,0
Welding and Soldering; Micro structural Evolution of Metals During Welding and Soldering; Power Sources in Welding; Electrical Concepts in Welding (AC and DC Sources; Constant Current and Constant Voltage and Electrical Stick Out); Effects Polarity of Work Piece and Electrode; Consumable and Non-Consumable Electrodes; Choosing Electrodes for Specific Welding Operations; Welding Methods: Diffusion welding; Spot Welding; Shielded Metal Arc Welding; Gas-Tungsten Arc Welding; Gas Metal Arc Welding; Flux-Cored Arc Welding; Submerged Arc Welding; Electro slag Welding; E-Beam and Laser Welding; Welding of Reactive Metals Al and Mg; Soldering Alloys; Case Studies Involving Soldering and Welding.

MLZ 445 Phase Transformations in Metals and Alloys 3+0 4,0
Phenomenological and Atomistic Approaches in Solid State Diffusion; Diffusion Transformations in Solids; Free energy-composition diagrams in precipitation: Precipitation transformations; Solid-state nucleation; precipitation kinetics; Eutectoid Transformation and Discontinuous Precipitation. Diffusionless Transformations: Martensite crystallography; thermodynamics and types of marten sites; Bainite transformation.

MLZ 446 Textile Materials 3+0 4,0
Main types of textile structures; Classification of textile fibers: Natural fibers; Chemical fibers and their production methods; Basic properties of fibers; Analysis of the fibers; New fiber types; Yarns and Spinning Systems; Textile Fabrics: Knitting and weaving technologies; Basic fabric structures; Textile finishing; Fabric dying and printing technologies.

MLZ 448 Dental Materials 3+0 4,0
Basic science for dental materials; Biomaterials and biocompatibility; Structure of dental ceramics; Structure of metal and alloys; Structure of polymers; Mechanical, physical and chemical properties of dental materials; Clinical dental materials; Laboratory and related dental materials; Gypsum products; Dental resins; Casting alloys for metallic restorations; Dental prosthesis; Metal-ceramic dental prosthesis; All-ceramic dental prosthesis; Alumina frameworks; Zirconia frameworks; Glass infiltrated dental materials, Glass-ceramic dental materials; Luting agents. Stainless steel.

MLZ 450 Computational Materials Science 3+0 4,0
Importance of the Computational Materials Science; Application Areas of Computational Materials Science; Structural Properties of Materials; Electronic Properties of Materials; Basic Quantum Mechanics; Schrödinger Equation; Molecular Dynamics and Simulations.

MLZ 451 Machining Technology of Metals 3+0 4,0
Metal Machining; Turning; Drilling; Milling; Cutting Forces; Cutting Tool Geometry; Cutting Tool Materials; Abrasive Wear; Chemical Wear; Superalloys; Iron-based Alloys; Aluminum Alloys; Ceramic Cutting Tools; Cemented Carbides; Ultra Hard Materials; High Speed Steels.

MLZ 452 Engineering Materials for Armour Applications 3+0 4,0
Ballistics and Types of Ballistics: Internal ballistics, Transition ballistics, External ballistics, Terminal ballistics; Threats and Mechanisms; Mechanical Behaviors of Bullets and Rockets; Types of Armours; Ceramic armours, Metallic armours, Polymer based armours, B4C-Al composite; Alumina (Al2O3); Mullite; Cordierite; Silicon Carbide (SiC); Titanium Diboride (TiB2); TiB2-Ni Composites; Kevlar; Active and Reactive Armour Systems; Armour Design.

MLZ 454 Smart Materials 3+0 4,0
Shape Memory Alloys; Piezoelectric Materials; Electro-active Polymers; Sensors and Actuators; Martensitic Phase Transformation; Shape Memory Effect; Super elasticity; Crystal Structure; Direct and Indirect Piezoelectric Effect; Energy Storage; Seismic Isolation; Deformable Structures.

MLZ 456 Phsysical Properties of Nanomaterials 3+0 4,0
Importance of Materials Science; Nanomaterials; Application Areas of Nanomaterials; Physical and Structural Properties of Nanomaterials; Simulation techniques for Nanomaterials; Basic Quantum Physics and Mechanics; Applications of Computational Material Science and Nanomaterials; Small Sized Nanomaterials based on C, Si and Ge.

MLZ 458 Mathematical Relations in Powder Processing 3+0 4,0
Particle size distribution models; Stoke's Law; Langmiur Theory; BrunauerEmmettTeller (BET); Equations for compaction; Bimodal powder packing; Washburn equation; Random-walk diffusion; Fick's first and second law; Herring scaling law; Laplace equation; Densification and grain growth mechanisms; Combined stage sintering model; Creep models; Stereological analysis; Weibull distribution.

MLZ 490 Application in Materials Engineering 2+2 5,0
Establishment of Application Problems in Materials Science and Engineering; Broad Literature and Textbook Survey of Selected Problems in the Questionnaire; Oral Presentation of Answers to Responsible Lecturers; Discussion of the Answers with the Lecturers in the Light of Answer Sheets.

MLZ 497 Design for Materials Science and Engineering 1+2 3,0
Preliminary Research on the Topic Chosen under the Guidance of an Advisor; A Broad Literature Survey about the Topic; Preliminary Studies for Setting-up Laboratory Experiments; Design of Experimental Set-ups; Acquisition of Data for Theoretical and/or Modeling Studies; Determining Steps of the Study; Reporting the Results.

MLZ 498 Design Applications in Materials Science and Engineering 2+4 7,0
Theoretical and/or Experimental Works Related to the Chosen Topic under the Guidance of an Advisor; Reporting the Results; Presentation of the Results as a Poster; Oral Presentation before a Jury.

MTR 401 Mechatronics 2+2 5,0
Introduction to Mechatronics, The concept of mechatronic system, Introduction to system components and classifications; Sensors and Transducers, Introduction to sensors and transducers used in mechatronic systems, Selection of useful sensor and transducers; Data Acquisition Systems; Signal Conditioning; Actuators; System Modeling-Mechanics; Electric-Electronic System Modeling; Controller Design; Microprocessors and PLC.

MUH 151 Introduction to Accounting 3+0 4,5
Concepts of Business and Accounting; Financial Transactions; Balance of Assets-Liabilities; Balance Sheet and Income Statement; Accounts: Concept of account, Types of accounts, Account chart; Document and Books; Accounting Process; Follow up Goods Transactions: Inventories and transactions of the purchase and sale of goods, Periodic inventory system, Perpetual inventory system; Liquid Assets: Cash, Banks, Checkups; Marketable Securities: Share certificates, Bonds; Receivables: Trade receivable, Other receivable; Long Term Assets; Liabilities;

Shareholders Equity; Transactions of Income and Expenses; End of Period Transactions; Preparing Financial Statements and Closing Transactions.

MUH 210 General and Cost Accounting 3+0 3,0
Company and Accounting; Financial qualified operations, Balance of assets-resource, Balancing income, Accounts: Concept of account, Types of accounts, Planning of account(s); Documents and books; Process of account; Intermittent Inventory method, Perpetual Inventory method; Income and Expenditure Process; End of Period process; Arrangement of Financial Statement and Closing Process; Cost Accounting and Main concepts; Uniform Accounting System; Type of cost: Standard, Variable cost system; Classification of Costs; Material costs; Labor costs and performance evaluation tool; Manufacturing overhead costs; Cost Centers and cost allocations; Job cost system, Process cost system; Cost in joint production.

MUH 210 General and Cost Accounting 3+0 3,0
Company and Accounting; Financial qualified operations, Balance of assets-resource, Balancing income, Accounts: Concept of account, Types of accounts, Planning of account(s); Documents and books; Process of account; Intermittent Inventory method, Perpetual Inventory method; Income and Expenditure Process; End of Period process; Arrangement of Financial Statement and Closing Process; Cost Accounting and Main concepts; Uniform Accounting System; Type of cost: Standard, Variable cost system; Classification of Costs; Material costs; Labor costs and performance evaluation tool; Manufacturing overhead costs; Cost Centers and cost allocations; Job cost system, Process cost system; Cost in joint production.

MÜH 302 Interdisciplinary Applications 1+2 4,5
The Notion of Interdisciplinary Study; Topic Selection; Conduction of an Extensive Literature Survey about the Topic; Discussion of the Topics Among Students from Different Disciplines; Conclusion of the Study by Overseeing Up-to-Date Economical and Social Criteria and Following Ethical Standards; Preparation of a Poster Presentation Incorporating the Steps and Results of the Study; Presentation of the Study Before a Jury or an Audience.

MÜH 302 Interdisciplinary Applications 1+2 4,5
The Notion of Interdisciplinary Study; Topic Selection; Conduction of an Extensive Literature Survey about the Topic; Discussion of the Topics Among Students from Different Disciplines; Conclusion of the Study by Overseeing Up-to-Date Economical and Social Criteria and Following Ethical Standards; Preparation of a Poster Presentation Incorporating the Steps and Results of the Study; Presentation of the Study Before a Jury or an Audience.

MÜH 402 Engineering Ethics 2+0 3,0
A Brief History of Ethics; Introduction to Ethical Conflicts; Values and Value Systems/History of engineering profession; Computer and Hacker Ethics/Business Ethics; Incident at Morales; Environmental Ethics/Climate Change Ethics; Case studies for engineering ethics.

MÜH 402 Engineering Ethics 2+0 3,0
A Brief History of Ethics; Introduction to Ethical Conflicts; Values and Value Systems/History of engineering profession; Computer and Hacker Ethics/Business Ethics; Incident at Morales; Environmental Ethics/Climate Change Ethics; Case studies for engineering ethics.

MÜH 404 Innovation Management 3+0 3,0
Innovation Concept: History and Evolution of Knowledge, World of Innovation, Defining Innovation Models; Innovation and Creativity: Creativity Concept, Fostering Creativity in Organizations, Factors Fostering Creativity, Creativity to Innovation, Tools for Creativity; Innovation in Information Age: Innovation Process, Innovation Types, Barriers to Innovation, Recent Innovation Trends, Analyzing Innovation, Conditions of Information Age, Innovative Thinking, Breakthrough Innovation Process, Innovative Idea Generation, Encouraging Innovation in the Organization, Building an Innovative Organization, Measures of Innovation: Recent Measures of Innovation, Process Based Measures of Innovation; Institutionalizing Innovation: Innovation in Service, Protecting the Innovation, Commercializing the Innovation, Managing Campus-Based Innovations, Managing Innovative Activities.

MÜH 404 Innovation Management 3+0 3,0
Innovation Concept: History and Evolution of Knowledge, World of Innovation, Defining Innovation Models; Innovation and Creativity: Creativity Concept, Fostering Creativity in Organizations, Factors Fostering Creativity, Creativity to Innovation, Tools for Creativity; Innovation in Information Age: Innovation Process, Innovation Types, Barriers to Innovation, Recent Innovation Trends, Analyzing Innovation, Conditions of Information Age, Innovative Thinking, Breakthrough Innovation Process, Innovative Idea Generation, Encouraging Innovation in the Organization, Building an Innovative Organization, Measures of Innovation: Recent Measures of Innovation, Process Based Measures of Innovation; Institutionalizing Innovation: Innovation in Service, Protecting the Innovation, Commercializing the Innovation, Managing Campus-Based Innovations, Managing Innovative Activities.

MÜZ 101 Evolution of Music 2+0 3,0
History of Music: Antique period, Middle Ages, Renaissance, Baroque, Music in the 17th and 19th centuries; Music in the 20th Century: Regionalism, Nationalism, Universality; Cultural Mosaic of Anatolian Music; Place of Turkish Music in the International Arena; Developing Appreciation of Music from Different Periods.

MÜZ 151 Short History of Music 2+0 3,0
Mile Stones in the History of Music; Music of the Antique Period; Music of Far East; Music of Anatolia; Music of the Middle Ages: Gregorian Chants; Music of Renaissance: Bach and Handel; Music of the Classical Age; Pianoforte in

the Classical Age; Romantic Age; Nationalist Movement; Contemporary Music; Nationalism and Universality.

MÜZ 155 Turkish Folk Music 2+0 2,0
Folk songs from different Regions of Turkey are Taught; Aegean Region Zeybek Folk Songs: Eklemedir koca konak, Ah bir ateş ver, Çökertme, Kütahya'nın pınarları, Çemberinde gül oya; Kars Region Azerbaijani Folk Songs: Bu gala daşlı gala, Yollarına baka baka, Dağlar gızı Reyhan, Ayrılık, Dut ağacı boyunca; Central Anatolian Region Folk Songs: Seherde bir bağa girdim, Uzun ince bir yoldayım, Güzelliğin on para etmez, Mihriban ve Acem kızı; Southeastern Anatolian Region; Urfa and Diyarbakır Folk Songs: Allı turnam, Urfanın etrafı, Mardin kapısından atlayamadım, Fırat türküsü, Evlerinin önü kuyu; Blacksea Region; Trabzon, Rize, Artvin Folk Songs: Maçka yolları taşlı, Ben giderim Batuma, Dere geliyor dere.

MÜZ 157 Traditional Turkish Art Music 2+0 2,0
Description of Traditional Art Music: Basic concepts, Characteristics, Types, Notes, Instruments; The Mode System of Traditional Turkish Art Music; The Rhythmic Pattern of Traditional Turkish Art Music; Samples from Different Modes; Samples from Different Rhythmic Patterns.

NÜM 202 Linear Algebra and Numerical Methods 4+0 4,5
Matrices and Determinants: Definition of Matrix and its applications; Determinants and Inverse Matrix; Solutions of Nonlinear Systems of Equations; Graphical Method, Interval Halving Method, Interpolation and Newton-Raphson method; Interpolation: Various methods of interpolation; Curve Fitting; Least Squares Method; Numerical Differentiation: Derivation of 1st , 2nd and 3rd derivatives numerically; Numerical Integration: Trapezoidal rule of integration; Simpson's Method; Ordinary Differential Equations; Runge-Kutta Method; Euler Method; Taylor's Series Method; Numerical Solutions of Partial Differential Equations: Parabolic, Elliptic and Hyperbolic Equations.

NÜM 202 Linear Algebra and Numerical Methods 4+0 4,5
Matrices and Determinants: Definition of Matrix and its applications; Determinants and Inverse Matrix; Solutions of Nonlinear Systems of Equations; Graphical Method, Interval Halving Method, Interpolation and Newton-Raphson method; Interpolation: Various methods of interpolation; Curve Fitting; Least Squares Method; Numerical Differentiation: Derivation of 1st , 2nd and 3rd derivatives numerically; Numerical Integration: Trapezoidal rule of integration; Simpson's Method; Ordinary Differential Equations; Runge-Kutta Method; Euler Method; Taylor's Series Method; Numerical Solutions of Partial Differential Equations: Parabolic, Elliptic and Hyperbolic Equations.

NÜM 301 Numerical Methods 3+0 3,5
Numerical Solutions of Nonlinear Systems of Equations: Graphical method, Interval halving method, Newton-Raphson methods; Interpolation: Forward, Backward and Central interpolation; Numerical Integration: Trapezoidal Rule of Integration and Simpson's Rule; Numerical Differentiation: Undetermined coefficients method; Numerical Solution of Ordinary Differential Equations: Taylor series method, Runge-Kutta method, Euler methods; Curve Fitting: Method of least squares.

PSİ 102 Psychology 3+0 3,5
What is Psychology?: Theoretical developments, Major Sub-Disciplines and methodology; Growth and Development; Motivation and Defense Mechanisms; Attention and Perception; Learning: Behavioral and cognitive approaches; Verbal Learning and Memory; Language and communication; Personality; Abnormal Behavior: Causes, Types and treatment.

PSİ 102 Psychology 3+0 3,5
What is Psychology?: Theoretical developments, Major Sub-Disciplines and methodology; Growth and Development; Motivation and Defense Mechanisms; Attention and Perception; Learning: Behavioral and cognitive approaches; Verbal Learning and Memory; Language and communication; Personality; Abnormal Behavior: Causes, Types and treatment.

PSİ 301 Industrial Psychology 3+0 4,5
Introduction to Industrial Psychology: Job analysis, Uses of job analysis, Selection of employees; Performance Evaluation: Goals, Evaluation techniques, Employee training and development; Motivation and Job Gratification: Job gratification and its effects on the job, Resistance toward organizational change and solutions; Work Conditions and Accidents: Lighting, Noise, Humidity, Air pollution, Internal work conditions, Boredom and fatigue, Causes of Work Place Accidents; Stress; Causes of stress, Ways of overcoming stress.

PZL 211 Principles of Marketing 3+0 5,0
Marketing: Scope, Evolution of Marketing; Marketing Environment; Marketing Research and Marketing Information Systems; Market Segmentation; Selecting Target Markets; Elements of Marketing Mix: Product, Price, Distribution channels, Promotion; Organization of Marketing Activities; International Marketing.

PZL 302 Marketing Management 3+0 4,5
Concept of Marketing; Evolution of Marketing; Functions of Marketing; Environmental Conditions of Marketing; Marketing Information Systems and Marketing Research; Market Concept; Market Segmentation and Target Market Selection; Customer Behavior in Industrial Markets; Product; Price; Distribution Channels and Physical Distribution; Sales Promotions; International Marketing.

PZL 302 Marketing Management 3+0 4,5
Concept of Marketing; Evolution of Marketing; Functions of Marketing; Environmental Conditions of Marketing; Marketing Information Systems and Marketing Research; Market Concept; Market Segmentation and Target Market Selection; Customer Behavior in Industrial Markets;

Product; Price; Distribution Channels and Physical Distribution; Sales Promotions; International Marketing.

PZL 310 Marketing Management 3+0 5,0
Concept of Product; Product and service decisions, Branding strategy, New product development strategy, New product development process and management, Product life cycle strategies; Concept of Price: Major pricing strategies, New product pricing strategies, Product mix pricing strategies, Price adjustment strategies, Price changes, Marketing channels; Supply Chains and Value Delivery Network; Channel Behavior and Organization; Integrated Marketing Communications: Promotion mix, Communication mix, Advertising and public relations, Personal selling and sales promotion, Direct and online marketing.

PZL 452 Revenue Management and Pricing 3+0 6,0
Basic Concepts About Revenue Management and Pricing; Different Approaches to Pricing; Application Examples; Price-Response Function; Pricing Models; Basic Price Optimization; Price Differentiation; Pricing With Constrained Supply; Pricing Under Competition; Variable Pricing; Market Segmentation; Capacity Allocation; Overbooking; Dynamic Pricing; Promotions and Markdown Management.

RUS 255 Russian I 3+0 4,0
Russian Alphabet; Transcriptions of Sounds in Russian; Russian Ortography; Phonetic Perception of Sounds; Consonants and Vowels; Intonation and Stress; Nouns: Proper and Common Nouns; Masculine, Feminine and Neutral Nouns; Russian Names for Men and Women; The Use of Number with Nouns; Greeting Structures; Asking for Directions; Introducing Oneself; Asking and Telling the Time; Patterns Used in Shopping; Patterns Used in Telephone Conversations.

RUS 256 Russian II 3+0 4,0
Plural Nouns; Construction of Plural Nouns: Plural-only and Singular-only Nouns; Adjectives: Types of adjectives, Forms of Adjectives; Numbers: Different Types of Numbers; Verbs: Types of verbs; Infinitives; Tenses: Present Continuous Tense, Past Tense, Future Tenses; Action Verbs.

SAN 155 Hall Dances 0+2 2,0
Basic concepts. The ethics of dance, Dance Nights, Dance Costumes, National International Competitions and rules/grading, Basic Definitions, Classifications of Dances: Social Dances; Salsa, Cha Cha, Samba, Mambo, Jive, Rock'n Roll, Jazz, Merenge; Flamenko, Rumba, Passa -Doble, Argentina tango, Vals, Disco, Quickstep, Foxtrot, Bolero, European Tango: Ballroom Dances; Sportive Dances; Latin American Dances; Samba, Rumba, Jive, Passa-Doble, Cha Cha, Standart Dances; European Tango, Slow vals (English), Viyana vals, Slow foxtrot, Quickstep.

SNT 155 History of Art 2+0 2,0
History of Civilization and Evolution of Art: Prehistory to Present; Concepts and Terminology in Art with Samples; Interrelation among Art-Religion and Society; Effects of Religion on Artistic Development; Reflections and Interpretations of Judaism, Christianity and Islam on Art; Renaissance: Emergence, Effects, Artists, Works of Art; Architecture and Plastic Arts; Art in the 19th and 20th Centuries: Relevanceof the main historical events of the period.

SOS 153 Sociology 3+0 3,5
What is Sociology?; Methods and Research Strategies in Sociology; Theories of Sociology; Culture; Socialization; The Family; The Economy; Education; Religion; Political Institutions; Population; Social Groups; Social Stratification; Social Change; Urbanization and Urban Social Problems; The Industrialization Process and Effects of Industrialization; The Characteristics of Industrial Society; Crime and the Society; Science, Technology and Environment; Wars and the Effects of War on Society.

SOS 153 Sociology 3+0 3,5
What is Sociology?; Methods and Research Strategies in Sociology; Theories of Sociology; Culture; Socialization; The Family; The Economy; Education; Religion; Political Institutions; Population; Social Groups; Social Stratification; Social Change; Urbanization and Urban Social Problems; The Industrialization Process and Effects of Industrialization; The Characteristics of Industrial Society; Crime and the Society; Science, Technology and Environment; Wars and the Effects of War on Society.

SOS 154 Man and Sociology 2+0 3,0
Sociology; Definition; Development of Sociology; Methods and Methodology in Social Sciences: Research procedure, Scientific method and sociology, Validity and reliability, Ethics of Social Research; Culture and Society; Family and Gender Issues; Environmental Issues and Society; Media and Communications; Stages of Industrialization; Industrial Revolution and its Consequences; Urban Life and Urbanization: Urban problems in Turkey; Social Inequalities; Social Stratification.

SOS 155 Folkdance 2+0 2,0
Dance in Primitive Cultures; Dance in Earlier Civilizations; Dance in the Middle Age and Renaissance; Dance in the 18th and 19th Centuries; Dances of the 20th Century; Ballet; Turkish Dances; Emergence of Folkdance; Anatolian Folkdance: Classification, Accompanying instruments; Methods and Techniques of Collecting Folkdance; Problems in Collecting Folkdance; Teaching of Folkdance; Adapting Folkdance for Stage: Stage, Stage aesthetics and Choreography, Orientation and choreography.

TAR 165 Atatürk's Principles and History of Turkish Revolution I 2+0 2,0

Reform efforts of Ottoman State, General glance to the stagnation period, Reform searching in Turkey, Tanzimat Ferman and its bringing, The Era of Constitutional Monarchy in Turkey, Policy making during the era of first Constitutional Monarchy, Europe and Turkey, 1838-1914, Europe from imperialism to World War I, Turkey from Mudros to Lausanne, Carrying out of Eastern Question, Turkish Grand National Assembly and Political construction 1920-1923, Economic developments from Ottomans to Republic, The Proclamation of New Turkish State, from Lausanne to Republic.

TAR 166 Atatürk's Principles and History of Turkish Revolution II 2+0 2,0

The Restructuring Period; The Emergence of the fundamental policies in the Republic of Turkey (1923-1938 Period); Atatürk's Principles, and Studies on Language, History and Culture in the period of Atatürk; Turkish Foreign Policy and Application Principles in the period of Atatürk; Economic Developments from 1938 to 2002; 1938-2002 Period in Turkish Foreign Policy; Turkey after Atatürk's period; Social, Cultural and Artistic Changes and Developments from 1938 to Present.

TAR 201 History of Science 2+0 2,5

Science in Ancient Civilisations: Egypt and Mesopotamia, Antique Greece and Hellenistic Period, The Roman Civilisation; Science in the Middle Ages in Europe and Islamic World; Renaissance and Modern Science: Astronomy, Chemistry, Medicine, Biology, Physics, Mathematics, Galileo Galilei, Newton; The Age of Enlightenment: Astronomy, Mathematics and Physics in the 18th Century; The Industrial Revolution; Modern Science: Einstein's Revolution, Quantum Theory; Appearance of Atom Physics; Science today.

TER 207 Thermodynamics I 3+0 5,0

Basic Concepts; System; Phase and State; Phase Transitions; Zeroth Law of Thermodynamics; Ideal Gas and Phase Equation, First Law of Thermodynamics; Specific Heats; Internal Energy, Enthalpy and Specific Heat Capacity of Ideal Gases; Specific Heats of Solids and Fluids; Conservation of Mass; Conservation of Energy; Flow Work; Steady Flow Open System; Second Law of Thermodynamics; Heat Engines; Reversible and Irreversible Phase Transitions; Carnot Cycle; Clausius Inequality; Entropy, Principle of the Increase of Entropy; Third Law of Thermodynamics; Entropy Change of a Pure Substance; Entropy Changes in Ideal Gases; Reversible Steady Flow Work, Exergy and Second Law Analysis.

TER 208 Thermodynamics II 3+0 5,0

The Concept of Entropy; Entropy Change of a Pure Substance; Entropy Changes of Ideal Gases; Isentropic State Changes; T-Ds Relations; Reversible Processes; Work and Efficiency; Basic Thermodynamic Cycles; Carnot Cycle; Rankine Cycle; Inter-Combustion Engine Cycles: Otto and Diesel Cycles; Air Standards; Stirling and Ericson Cycles; Brayton Cycle; Refrigeration Cycles; Interheating; Effect of Intercooling and Regeneration Processes on Cycles.

TER 403 Thermodynamics 3+0 4,5

Energy Engineering: Natural analogies and models; State and Path Functions; Heat and Work; Deviations from Ideals; Closed and Open Systems; Four Laws of Thermodynamics; Energy Transfer Processes: Power cycles, Alternative energy applications; Physical and Chemical Equilibrium Conditions; Free Energy: Its relationship with temperature, Pressure and composition; Availability, Efficiency; Coordination of Energy- Environment Interactions.

THU 203 Community Services 0+2 3,0

Various Community Projects: Helping young students during their study periods or after school study sessions, Aiding the elderly in nursing homes, helping disabled individuals with various tasks, helping social services and aiding children with their education etc., take part in the projects which raise environmental awareness, Integrating with the community and enabling use of knowledge accumulated in the courses.

TİY 121 Introduction to Theatre 2+0 3,0

Fundamentals of Theatre; Historical Developments of Theatre; Important Periods in World Theatre; Study of Contemporary Interpretations: Plays and Actors; Application of Basic Acting Techniques; Critiquing; Evaluation; Improvisation.

TİY 152 Theatre 2+0 2,5

Theatre as a Cultural Institution: Relation of culture and theatre; The Place and Importance of Theatre in Culture; Theatre as a Communication Art: Definition of theatre, Origin and evolution of theatre, Aesthetic communication; Elements of Communication in Theatre: Decor, Costume, Stage, Actor, Director; Theatre Management: Historical development, Administration and Organization; Art Sociology: Theatre and society; Reflections of Cultural Issues in Turkish Plays.Reflections of Cultural Issues in Turkish Plays.

TİY 308 Republic Era Turkish Theatre 2+0 3,0

Republic Era Turkish Theatre: Political, Social, Cultural Art Life; Theatre Concepts; Western Theatre; Theatre Perception; Effects of Western Theatre on Turkish Theatre; Dramatic Types; Acting Methods, Directing, Playwriting, Dramatic Styles; Theatre Buildings; Directing Techniques; Analyzing Developments of Theatre; Theatre Education; State Theatres; Private Theatre Companies.

TKY 302 Quality Control 3+0 4,5

Quality Development and Quality Control: Quality development and dimensions of its concept, Probability and statistics in quality control; Quality Control in Total Quality Management; Statistical Methods Used in Quality Control: Variations and its measurement, Important batch and continuous dispersion, Sampling dispersions, Parameter estimate and hypothesis tests; Statistical Process Control (SPC): Philosophy of SPC and methods, Practice, Control

charts for attributable and quantity variables, Other statistical process control methods, Process ability analysis, Acceptance (consent) sampling and sampling plans, Various quality standards.

TKY 302 Quality Control 3+0 4,5

Quality Development and Quality Control: Quality development and dimensions of its concept, Probability and statistics in quality control; Quality Control in Total Quality Management; Statistical Methods Used in Quality Control: Variations and its measurement, Important batch and continuous dispersion, Sampling dispersions, Parameter estimate and hypothesis tests; Statistical Process Control (SPC): Philosophy of SPC and methods, Practice, Control charts for attributable and quantity variables, Other statistical process control methods, Process ability analysis, Acceptance (consent) sampling and sampling plans, Various quality standards.

TKY 405 Total Quality Management 3+0 4,5

History of Total Quality Management; Excellence Model; Total Quality Management Service and Production Sector; Advanced Quality Techniques such as Failure Mode and Effect Analysis: Type of Failure Mode and Effect Analysis, Methods; Customer Satisfaction; Transformation of Customer Needs to Technical Requirements; Quality Function Deployment; Reducing Variance; Six Sigma Approach to Quality.

TOP 102 Surveying 2+2 4,5

Concepts Related to Topography; Simple Measurement Tools and Horizontal Measurement: Application of right angles, Application of right angles by the help of prisms, Application of lines; Length Measurement: Calculation of Surveying and levelment; Calculation of Area: Calculation of area according to measurement values, Calculation of area according to coordinate values, Calculation of area according to Cross Method; Theodolite and Angle Measurement: Measuring horizontal and vertical angles, Length measuring; Drawing Maps and Plans Using The Dimensions of a Field: Calculation of Coordinates; Calculation of Polygons.

TOP 102 Surveying 2+2 4,5

Concepts Related to Topography; Simple Measurement Tools and Horizontal Measurement: Application of right angles, Application of right angles by the help of prisms, Application of lines; Length Measurement: Calculation of Surveying and levelment; Calculation of Area: Calculation of area according to measurement values, Calculation of area according to coordinate values, Calculation of area according to Cross Method; Theodolite and Angle Measurement: Measuring horizontal and vertical angles, Length measuring; Drawing Maps and Plans Using The Dimensions of a Field: Calculation of Coordinates; Calculation of Polygons.

TRS 110 Technical Drawing in Civil Engineering 2+2 4,5

Presentation of using materials at technical drawing, line types and using places. Scales; drawing views of solid objects by using projection methods, type and methods of dimensioning members; taking cross section methods from solid bodies. Types of perspective, perspective drawing methods of solid objects, architectural floor plans; architectural symbols of structural members. Drawing and dimensioning of main views of architectural floor plans. Drawing and dimensioning of cross section views according to architectural floor plan. Drawing and dimensioning of cross section views according to architectural floor plan, foundation type; foundation plan, symbol and cross section views. Drawing the cross section views and symbols of floor formwork plans, . Types of staircases in structure, drawing the plan and cross section of staircases. Drawing the plan and cross section views of roof. Drawing the cross section views and symbols of column application plans.

TRS 110 Technical Drawing in Civil Engineering 2+2 4,5

Presentation of using materials at technical drawing, line types and using places. Scales; drawing views of solid objects by using projection methods, type and methods of dimensioning members; taking cross section methods from solid bodies. Types of perspective, perspective drawing methods of solid objects, architectural floor plans; architectural symbols of structural members. Drawing and dimensioning of main views of architectural floor plans. Drawing and dimensioning of cross section views according to architectural floor plan. Drawing and dimensioning of cross section views according to architectural floor plan, foundation type; foundation plan, symbol and cross section views. Drawing the cross section views and symbols of floor formwork plans, . Types of staircases in structure, drawing the plan and cross section of staircases. Drawing the plan and cross section views of roof. Drawing the cross section views and symbols of column application plans.

TRS 127 Technical Drawing 2+2 4,5

Fundamentals of Engineering Graphics & Traditional Tools; Geometrical Construction (coordinate systems, drawing of simple geometric objects); Multiviews and Visualization (projection theory and orthographic projection); Perspective Views; Auxiliary and Section Views; Dimensions and Tolerances (dimensional tolerances, interferences, geometric tolerances and surface finish symbols); Drawing of Machine and Construction Components; Assembly and Working Drawings (title blocks, bill of materials, creating a technical drawing project and presentation); Introduction to Computer Aided Drawing.

TRS 127 Technical Drawing 2+2 4,5

Fundamentals of Engineering Graphics & Traditional Tools; Geometrical Construction (coordinate systems, drawing of simple geometric objects); Multiviews and Visualization (projection theory and orthographic projection); Perspective Views; Auxiliary and Section Views; Dimensions and Tolerances (dimensional tolerances, interferences, geometric tolerances and surface finish symbols); Drawing of Machine and Construction Components; Assembly and Working Drawings (title blocks, bill of materials, creating a technical drawing project and presentation); Introduction to Computer Aided Drawing.

TÜR 120 Turkish Sign Language 3+0 3,0

Overview of Sign Language: Characteristics of sign language; History of Sign Language in the World: Emergence of language and sign language, Verbal education and approaches to sign language; History of Turkish Sign Language: Early period, Ottoman period, Period of the Republic of Turkey; Introduction to Turkish Sign Language: Finger alphabet, Pronouns, Introducing oneself and family, Greetings, Meeting, Relationship words; Showing Basic Words: Adjectives: Adjectives of quality, Adjectives of quantity; Verbs: Present tense, Past tense, Future tense, Time adverbs, Antonyms; Healthy Living: Expression of health-related problems, Sports terms, Expressing requirements; In a Bank: Expressions required to carry out basic procedures in a bank; Vacation: Basic words about vacation.

TÜR 125 Turkish Language I 2+0 2,0

Language: Characteristics of language, Relationship between language and thought and language and emotion, Theories about the origin of languages, Language types, The position of Turkish Language among world languages; Relationship Between Language and Culture; Historical Progress of the Turkish Language; Alphabets Used for Writing in Turkish; Turkish Language Studies; Turkish Language Reform; Phonetics; Morphology and Syntax; The Interaction of Turkish Language with Other Languages; Wealth of Turkish Language; Problems Facing Turkish Language; Derivation of Terms and Words; Disorders of Oral and Written Expression.

TÜR 126 Turkish Language II 2+0 2,0

Composition: Written composition, Paragraph and ways of expression in paragraphs; Punctuation; Spelling Rules; Types of Written Expression and Practices I: Expository writing; Types of Written Expression and Practices II: Narrative writing; Academic Writing and Types of Correspondence; Reading and Listening: Reading, Reading comprehension strategies, Critical reading; Listening; Relationship between Listening and Reading; Oral Expression: Basic principles of effective speech; Body Language and the Role of Body Language in Oral Expression; Speech Types; Principles and Techniques of Effective Presentation; Some Articulatory Features of Oral Expression.