Bioengineering
Undergraduate - Formal Education

Total Number of course: -944 T: -949,5 U: -549 Credit: -1243 ECTS: -1263 T + U: -1498,5

1.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	PHY 1305	Physics I	2	2	3	6
2	CHE 1313	General Chemistry	2	2	3	6
3	TUR 1111	Turkish I	2	0	2	2
4	HIS 1101	Atatürk's Principles and History of Revolution I	2	0	2	2
5	MTH 1305	Mathematics I	4	0	4	7
6	ENG 1135	Professional English I	2	0	2	4
7	BIE 1111	Introduction to Bioengineering	2	0	2	2
8	BIE 1121	General Biology	3	0	3	4
		Total:	**19**	**4**	**21**	**33**

2.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	MTH 1306	Mathematics II	4	0	4	7
2	TUR 1112	Turkish II	2	0	2	2
3	HIS 1102	Atatürk's Principles and History of Revolution II	2	0	2	2
4	PHY 1306	Physics II	2	2	3	6
5	ENG 1136	Proffesional English II	2	0	2	4
6	BIE 1114	Organic Chemistry	2	0	2	3
7	ENG 1100	Computer Aided Technical Drawing	2	2	3	4
8	ENG 1138	Engineering Mechanics	3	0	3	4
		Total:	**19**	**4**	**21**	**32**

3.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	MTH 2303	Differential Equation	4	0	4	7
2	ENG 2115	Social Responsibility Project	1	0	1	1
3	BIE 2127	General Microbiology	2	2	3	5
4	BIE 2115	Stochiometry	2	2	3	4
5	BIE 2113	Biomaterials	3	0	3	3
6	BIE 2123	Biochemistry	3	0	3	4
7	BIE 2125	Basic Computer Programming	2	2	3	4
8	BIE 2129	Physical Chemistry	3	0	3	3
		Total:	**20**	**6**	**23**	**31**

4.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	MTH 2302	Numerical Methods in Engineering	4	0	4	6
2	ENG 3140	Engineering Economy	2	0	2	3
3	ENG 3120	Statistics	3	0	3	4
4	ENG 2164	Thermodynamics	2	2	3	5
5	ENG 2166	Fluid Mechanics	2	2	3	5
6	BIE 2118	Molecular Biology	3	0	3	4
7	BIE 2122	Biopolymers	3	0	3	3
		Toplam:	**19**	**4**	**21**	**30**

5.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	ENG 3100	Engineering Management and Ethics	2	0	2	3
2	BIE 3113	Bioprocess Engineering	2	2	3	5
3	BIE 3117	Bioengineering Lab. I	0	4	2	4
4	BIE 3003	Summer Practice - I	0	0	0	5
5	ENG 3133	Heat Transfer	3	1	3,5	5
6	BIE 3001	Technical Elective Courses-I	6	0	6	8
		Total:	**17**	**7**	**16,5**	**30**

6.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	BIE 3118	Bioengineering Lab. II	0	4	2	5
2	CBU 4405	Job Safety and Workers' Health-I	2	0	2	2
3	BIE 3122	Bioreaction Engineering	3	0	3	5
4	BIE 3126	Biomedical Engineering and Instruments	4	0	4	6
5	ENG 3134	Biomechanics	3	0	3	5
6	ENG 3136	Mass Transfer	2	0	2	3
7	BIE 3002	Technical Elective Courses - II	3	0	0	4
		Total:	**17**	**4**	**19**	**30**

7.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	BIE 4101	Biotechnology and Genetic Engineering	3	0	3	5
2	CBU 4406	Job Safety and Workers' Health-II	2	0	2	2
3	BIE 4119	Bioengineering Design	3	0	3	4
4	BIE 4117	Bioprocess Dynamics and Control	3	0	3	5
5	BIE 4123	Physiology	3	0	3	4
6	BIE 4111	Graduation Project I	3	0	3	4
7	BIE 4001	Technical Elective Courses - III	3	0	3	4
8	SEC 1000	Non - Technical Elective Courses	2	0	2	2
		Total:	**22**	**0**	**22**	**30**

8.SEMESTER

No	Code	Course	T	U	Credit	ECTS
1	BIE 4110	Vocational Training in Workplace	5	0	5	20
2	BIE 4122	Graduation Project II	3	0	3	10
		Total:	**8**	**0**	**8**	**30**

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BIE 3001 – Technical Elective Courses - I

No	Code	Course	T	U	Credit	ECTS
1	BIE 3201	Biomechanics	3	0	3	4
2	BIE 3207	Hazardous Waste Treatment Techniques	3	0	3	4
3	BIE 3208	Biological Processes	3	0	3	4
4	BIE 3211	Ecology	3	0	3	4
5	BIE 3213	Cancer Biology	3	0	3	4
6	BIE 3214	Enzyme Technology	3	0	3	4
7	BIE 3215	Virology	3	0	3	4
8	BIE 3216	Artificial Organ Technology	3	0	3	4
9	BIE 3217	Immunology	3	0	3	4
10	BIE 3218	Living Cell Culture	3	0	3	4
11	BIE 3219	Food Microbiology	3	0	3	4
12	BIE 4202	Medical Genetic	3	0	3	4
13	BIE 4204	Genomic and Proteomic	3	0	3	4
14	BIE 4208	Biomarker and System	3	0	3	4
15	BIE 4209	Molecular Genetic	3	0	3	4
16	BIE 4210	Biosensors	3	0	3	4
17	BIE 4211	Microbial Genetic	3	0	3	4
18	BIE 4213	Cell Biology	3	0	3	4
19	BIE 4214	Bioinformatics	3	0	3	4
20	CBU 4401	Girişimcilik	3	0	3	4
21	BIE 4232	Biomimicking with Liquid Crystals	3	0	3	4
22	BIE 4233	Liquid Crystals in Biological Structures	3	0	3	4
23	BIE 4234	Microfluidics in Bioengineering Applications	3	0	3	4
24	BIE 4235	Electrochemistry	3	0	3	4
25	BIE 4240	Industrial Bioreactors and Scale-Up	3	0	3	4
26	BIE 4242	Microalgal Technologies	3	0	3	4
27	BIE 4243	Photobioreactors and Applications	3	0	3	4
28	BIE 4244	Biodesign as A Sustainable Design Methodology	3	0	3	4
29	BIE 4245	Biobased Economy	3	0	3	4
30	BIE 4246	Bio-fuel Production Technologies	3	0	3	4
31	BIE 4247	Supercriticl Fluid Technologies	3	0	3	4
32	BIE 4248	Environmental Biotechnology	3	0	3	4
33	BIE 3221	Molecular Modelling	3	0	3	4
34	BIE 3223	Tissue Engineering	3	0	3	4
35	BIE 3224	Mathematical Application in Bioengineering System	3	0	3	4
36	BIE 3225	Experimental animal models	3	0	3	4
37	BIE 3226	In vitro models for preclinical studies	3	0	3	4
38	BIE 3227	Biosimilars	3	0	3	4
		Total:	**114**	**0**	**114**	**152**

BIE 3002 – Technical Elective Courses - II

No	Code	Course	T	U	Credit	ECTS
1	BIE 3201	Biomechanics	3	0	3	4
2	BIE 3207	Hazardous Waste Treatment Techniques	3	0	3	4
3	BIE 3208	Biological Processes	3	0	3	4
4	BIE 3211	Ecology	3	0	3	4
5	BIE 3213	Cancer Biology	3	0	3	4
6	BIE 3214	Enzyme Technology	3	0	3	4
7	BIE 3215	Virology	3	0	3	4
8	BIE 3216	Artificial Organ Technology	3	0	3	4
9	BIE 3217	Immunology	3	0	3	4
10	BIE 3218	Living Cell Culture	3	0	3	4
11	BIE 3219	Food Microbiology	3	0	3	4
12	BIE 4202	Medical Genetic	3	0	3	4
13	BIE 4204	Genomic and Proteomic	3	0	3	4
14	BIE 4208	Biomarker and System	3	0	3	4
15	BIE 4209	Molecular Genetic	3	0	3	4
16	BIE 4210	Biosensors	3	0	3	4
17	BIE 4211	Microbial Genetic	3	0	3	4
18	BIE 4213	Cell Biology	3	0	3	4
19	BIE 4214	Bioinformatics	3	0	3	4
20	CBU 4401	Girişimcilik	3	0	3	4
21	BIE 4232	Biomimicking with Liquid Crystals	3	0	3	4
22	BIE 4233	Liquid Crystals in Biological Structures	3	0	3	4
23	BIE 4234	Microfluidics in Bioengineering Applications	3	0	3	4
24	BIE 4235	Electrochemistry	3	0	3	4
25	BIE 4240	Industrial Bioreactors and Scale-Up	3	0	3	4
26	BIE 4242	Microalgal Technologies	3	0	3	4
27	BIE 4243	Photobioreactors and Applications	3	0	3	4
28	BIE 4244	Biodesign as A Sustainable Design Methodology	3	0	3	4
29	BIE 4245	Biobased Economy	3	0	3	4
30	BIE 4246	Bio-fuel Production Technologies	3	0	3	4
31	BIE 4247	Supercriticl Fluid Technologies	3	0	3	4
32	BIE 4248	Environmental Biotechnology	3	0	3	4
33	BIE 3221	Molecular Modelling	3	0	3	4
34	BIE 3223	Tissue Engineering	3	0	3	4
35	BIE 3224	Mathematical Application in Bioengineering System	3	0	3	4
36	BIE 3225	Experimental animal models	3	0	3	4
37	BIE 3226	In vitro models for preclinical studies	3	0	3	4
38	BIE 3227	Biosimilars	3	0	3	4
		Total:	**114**	**0**	**114**	**152**

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BIE 4001 – Technical Elective Courses - III						
No	**Code**	**Course**	**T**	**U**	**Credit**	**ECTS**
1	BIE 3201	Biomechanics	3	0	3	4
2	BIE 3207	Hazardous Waste Treatment Techniques	3	0	3	4
3	BIE 3208	Biological Processes	3	0	3	4
4	BIE 3211	Ecology	3	0	3	4
5	BIE 3213	Cancer Biology	3	0	3	4
6	BIE 3214	Enzyme Technology	3	0	3	4
7	BIE 3215	Virology	3	0	3	4
8	BIE 3216	Artificial Organ Technology	3	0	3	4
9	BIE 3217	Immunology	3	0	3	4
10	BIE 3218	Living Cell Culture	3	0	3	4
11	BIE 3219	Food Microbiology	3	0	3	4
12	BIE 4202	Medical Genetic	3	0	3	4
13	BIE 4204	Genomic and Proteomic	3	0	3	4
14	BIE 4208	Biomarker and System	3	0	3	4
15	BIE 4209	Molecular Genetic	3	0	3	4
16	BIE 4210	Biosensors	3	0	3	4
17	BIE 4211	Microbial Genetic	3	0	3	4
18	BIE 4213	Cell Biology	3	0	3	4
19	BIE 4214	Bioinformatics	3	0	3	4
20	CBU 4401	Girişimcilik	3	0	3	4
21	BIE 4232	Biomimicking with Liquid Crystals	3	0	3	4
22	BIE 4233	Liquid Crystals in Biological Structures	3	0	3	4
23	BIE 4234	Microfluidics in Bioengineering Applications	3	0	3	4
24	BIE 4235	Electrochemistry	3	0	3	4
25	BIE 4240	Industrial Bioreactors and Scale-Up	3	0	3	4
26	BIE 4242	Microalgal Technologies	3	0	3	4
27	BIE 4243	Photobioreactors and Applications	3	0	3	4
28	BIE 4244	Biodesign as A Sustainable Design Methodology	3	0	3	4
29	BIE 4245	Biobased Economy	3	0	3	4
30	BIE 4246	Bio-fuel Production Technologies	3	0	3	4
31	BIE 4247	Supercriticl Fluid Technologies	3	0	3	4
32	BIE 4248	Environmental Biotechnology	3	0	3	4
33	BIE 3221	Molecular Modelling	3	0	3	4
34	BIE 3223	Tissue Engineering	3	0	3	4
35	BIE 3224	Mathematical Application in Bioengineering System	3	0	3	4
36	BIE 3225	Experimental animal models	3	0	3	4
37	BIE 3226	In vitro models for preclinical studies	3	0	3	4
38	BIE 3227	Biosimilars	3	0	3	4
		Total:	**114**	**0**	**114**	**152**

Total **Number of course: -944** **T: -949,5** **U: -549** **Credit: -1243** **ECTS: -1263** **T + U: -1498,5**

SEC 1000 - Non - Technical Elective Courses						
No	**Code**	**Course**	**T**	**U**	**Credit**	**ECTS**
1	SEC 3202	Engineering Documentaries	2	0	2	2
2	SEC 3216	Report Writing Techniques	2	0	2	2
3	SEC 3229	Photography	2	0	2	2
4	SEC 3232	Chess	2	0	2	2
5	SEC 3237	Table Tennis	2	0	2	2
6	SEC 3241	Football	2	0	2	2
7	SEC 3242	Handball	2	0	2	2
8	SEC 3243	Percussion	2	0	2	2
9	SEC 3256	Technology Management	2	0	2	2
10	SEC 3257	Innovation Management	2	0	2	2
11	SEC 3259	Intellectual Property Rights	2	0	2	2
12	SEC 3260	Project Training	2	0	2	2
13	SEC 3261	Amateur Fishing	2	0	2	2