# Bioengineering
# Undergraduates-Formal Education

**Total** **Number of Courses: -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 1301 | Physics I | 2 | 2 | 3 | 5 |
| 2 | CHE 1311 | General Chemistry | 2 | 2 | 3 | 5 |
| 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 1301 | Mathematics I | 4 | 0 | 4 | 6 |
| 6 | BIE 1101 | Introduction to Bioengineering | 2 | 0 | 2 | 6 |
| 7 | ENG 1135 | Professional English I | 2 | 0 | 2 | 4 |
| | | **Total:** | **16** | **4** | **18** | **30** |

## 2.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | MTH 1302 | Mathematics II | 4 | 0 | 4 | 6 |
| 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 | CSE 1306 | Basic Computer Programming | 2 | 2 | 3 | 4 |
| 5 | BIE 1102 | Biochemistry | 3 | 0 | 3 | 5 |
| 6 | BIE 1104 | Organic Chemistry | 3 | 0 | 3 | 5 |
| 7 | BIE 1108 | General Biology | 3 | 0 | 3 | 6 |
| | | **Total:** | **19** | **2** | **20** | **30** |

## 3.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | MTH 2301 | Differential Equation | 4 | 0 | 4 | 6 |
| 2 | BIE 2101 | Microbiology | 2 | 2 | 3 | 6 |
| 3 | ENG 2101 | Engineering Mechanics | 3 | 0 | 3 | 4 |
| 4 | ENG 2167 | Biomaterials | 3 | 0 | 3 | 5 |
| 5 | ENG 1123 | Linear Algebra | 3 | 0 | 3 | 4 |
| 6 | BIE 2111 | Stochiometry | 2 | 2 | 3 | 5 |
| | | | | | | |
| | | **Total:** | **17** | **4** | **19** | **30** |

## 4.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | MTH 2302 | Numerical Methods in Engineering | 4 | 0 | 4 | 6 |
| 2 | ENG 2162 | Basic Electricity and Electronics | 2 | 2 | 3 | 5 |
| 3 | ENG 3120 | Statistics | 3 | 0 | 3 | 4 |
| 4 | BIE 2108 | Molecular Biology | 3 | 0 | 3 | 4 |
| 5 | ENG 2164 | Thermodynamics | 2 | 2 | 3 | 5 |
| 6 | ENG 2166 | Fluid Mechanics | 2 | 2 | 3 | 5 |
| 7 | BIE 2122 | Biopolymers | 3 | 0 | 3 | 3 |
| | | **Total:** | **19** | **6** | **22** | **32** |

## 5.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3000 | Summer Practice - I | 0 | 0 | 0 | 4 |
| 2 | BIE 3109 | Bioprocess Engineering | 2 | 2 | 3 | 4 |
| 3 | ENG 3125 | Physical Chemistry | 3 | 0 | 3 | 3 |
| 4 | BIE 3115 | Bioengineering Lab. I | 0 | 4 | 2 | 5 |
| 5 | ENG 3121 | Mass Transfer | 3 | 0 | 3 | 4 |
| 6 | ENG 3109 | Heat Transfer Applications | 3 | 0 | 3 | 4 |
| 7 | ENG 3101 | Engineering Management and Ethics | 2 | 0 | 2 | 2 |
| 8 | BIE 3001 | Technical Elective Courses-I | 0 | 0 | 0 | 0 |
| | | **Total:** | **13** | **6** | **16** | **26** |

## 6.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3110 | Biotransport | 2 | 2 | 3 | 5 |
| 2 | BIE 3112 | Bioreaction Engineering | 3 | 0 | 3 | 4 |
| 3 | BIE 3114 | Physiology | 3 | 0 | 3 | 4 |
| 4 | BIE 3116 | Biomedical Engineering and Instruments | 4 | 0 | 4 | 4 |
| 5 | BIE 3118 | Bioengineering Lab. II | 0 | 4 | 2 | 5 |
| 6 | ENG 3124 | Biomechanics | 3 | 0 | 3 | 4 |
| 7 | BIE 3002 | Technical Elective Courses - II | 0 | 0 | 0 | 0 |
| | | | | | | |
| | | **Total:** | **15** | **6** | **18** | **26** |

## 7.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 4101 | Biotechnology and Genetic Engineering | 3 | 0 | 3 | 5 |
| 2 | BIE 4105 | Bioengineering Design - I | 3 | 2 | 4 | 6 |
| 3 | BIE 4000 | Summer Practice - II | 0 | 0 | 0 | 4 |
| 4 | BIE 4109 | Mathematical Application in Bioengineering Systems | 2 | 2 | 3 | 4 |
| 5 | BIE 4107 | Bioprocess Dynamics and Control | 3 | 0 | 3 | 3 |
| 6 | CBU 4405 | Job Safety and Workers' Health-I | 2 | 0 | 2 | 2 |
| 7 | BIE 4001 | Technical Elective Courses - III | 0 | 0 | 0 | 0 |
| 8 | SEC 1000 | Non - Technical Elective Courses | 0 | 0 | 2 | 0 |
| | | **Total:** | **13** | **4** | **17** | **24** |

## 8.SEMESTER

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 4104 | Tissue Engineering | 3 | 0 | 3 | 6 |
| 2 | BIE 4106 | Bioengineering Design - II | 3 | 2 | 4 | 6 |
| 3 | BIE 4114 | Seminar | 0 | 2 | 1 | 4 |
| 4 | BIE 4108 | Biosensors | 3 | 0 | 3 | 4 |
| 5 | CBU 4406 | Job Safety and Workers' Health-II | 2 | 0 | 2 | 2 |
| 6 | BIE 4002 | Technical Elective Courses - IV | 0 | 0 | 0 | 0 |
| | | | | | | |
| | | | | | | |
| | | **Total:** | **11** | **4** | **13** | **22** |

# Bioengineering
# Undergraduates-Formal Education

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

**BIE 3001 – Technical Elective Courses - I**

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3201 | Biomechanics | 3 | 0 | 3 | 4 |
| 2 | BIE 3202 | Biomechatronics | 3 | 0 | 3 | 4 |
| 3 | BIE 3203 | Molecule Engineering | 3 | 0 | 3 | 4 |
| 4 | BIE 3204 | Orthopedy Engineering | 3 | 0 | 3 | 4 |
| 5 | BIE 3205 | Biopolymers | 3 | 0 | 3 | 4 |
| 6 | BIE 3206 | Bioreactor Kinetics and Design | 3 | 0 | 3 | 4 |
| 7 | BIE 3207 | Hazardous Waste Treatment Techniques | 3 | 0 | 3 | 4 |
| 8 | BIE 3208 | Biological Processes | 3 | 0 | 3 | 4 |
| 9 | BIE 3209 | Toxicology | 3 | 0 | 3 | 4 |
| 10 | BIE 3210 | Synthetic Biology | 3 | 0 | 3 | 4 |
| 11 | BIE 3211 | Ecology | 3 | 0 | 3 | 4 |
| 12 | BIE 3212 | Neurobiology | 3 | 0 | 3 | 4 |
| 13 | BIE 3213 | Cancer Biology | 3 | 0 | 3 | 4 |
| 14 | BIE 3214 | Enzyme Technology | 3 | 0 | 3 | 4 |
| 15 | BIE 3215 | Virology | 3 | 0 | 3 | 4 |
| 16 | BIE 3216 | Artificial Organ Technology | 3 | 0 | 3 | 4 |
| 17 | BIE 3217 | Immunology | 3 | 0 | 3 | 4 |
| 18 | BIE 3218 | Living Cell Culture | 3 | 0 | 3 | 4 |
| 19 | BIE 3219 | Food Microbiology | 3 | 0 | 3 | 4 |
| 20 | BIE 3220 | Basic Image Processing Techniques | 3 | 0 | 3 | 4 |
| 21 | BIE 4201 | Human Body Dynamic | 3 | 0 | 3 | 4 |
| 22 | BIE 4202 | Medical Genetic | 3 | 0 | 3 | 4 |
| 23 | BIE 4203 | Human Physiology | 3 | 0 | 3 | 4 |
| 24 | BIE 4204 | Genomic and Proteomic | 3 | 0 | 3 | 4 |
| 25 | BIE 4205 | Biorobotic | 3 | 0 | 3 | 4 |
| 26 | BIE 4206 | Techniques of Genetic Engineering | 3 | 0 | 3 | 4 |
| 27 | BIE 4207 | Tissue and Organs Biomechanics | 3 | 0 | 3 | 4 |
| 28 | BIE 4208 | Biomarker and System | 3 | 0 | 3 | 4 |
| 29 | BIE 4209 | Molecular Genetic | 3 | 0 | 3 | 4 |
| 30 | BIE 4210 | Biosensors | 3 | 0 | 3 | 4 |
| 31 | BIE 4211 | Microbial Genetic | 3 | 0 | 3 | 4 |
| 32 | BIE 4212 | Computer Application in Bioinformatics | 3 | 0 | 3 | 4 |
| 33 | BIE 4213 | Cell Biology | 3 | 0 | 3 | 4 |
| 34 | BIE 4214 | Bioinformatics | 3 | 0 | 3 | 4 |
| 35 | BIE 4215 | Food Technology | 3 | 0 | 3 | 4 |
| 36 | BIE 4216 | Biopharmaceutic | 3 | 0 | 3 | 4 |
| 37 | BIE 4217 | Aquaculture | 3 | 0 | 3 | 4 |
| 38 | BIE 4218 | Bioprocesses Simulations | 3 | 0 | 3 | 4 |
| 39 | BIE 4219 | Biotechnological Applications | 3 | 0 | 3 | 4 |
| 40 | BIE 4220 | Neuroengineering | 3 | 0 | 3 | 4 |
| 41 | BIE 4221 | Environmental Biotechnology | 3 | 0 | 3 | 4 |
| 42 | BIE 4222 | Protein Design | 3 | 0 | 3 | 4 |
| 43 | BIE 4223 | Industrial Biotechnology | 3 | 0 | 3 | 4 |

**BIE 3002 – Technical Elective Courses - II**

| No | Code | Course | T | U | Kredi | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3201 | Biomechanics | 3 | 0 | 3 | 4 |
| 2 | BIE 3202 | Biomechatronics | 3 | 0 | 3 | 4 |
| 3 | BIE 3203 | Molecule Engineering | 3 | 0 | 3 | 4 |
| 4 | BIE 3204 | Orthopedy Engineering | 3 | 0 | 3 | 4 |
| 5 | BIE 3205 | Biopolymers | 3 | 0 | 3 | 4 |
| 6 | BIE 3206 | Bioreactor Kinetics and Design | 3 | 0 | 3 | 4 |
| 7 | BIE 3207 | Hazardous Waste Treatment Techniques | 3 | 0 | 3 | 4 |
| 8 | BIE 3208 | Biological Processes | 3 | 0 | 3 | 4 |
| 9 | BIE 3209 | Toxicology | 3 | 0 | 3 | 4 |
| 10 | BIE 3210 | Synthetic Biology | 3 | 0 | 3 | 4 |
| 11 | BIE 3211 | Ecology | 3 | 0 | 3 | 4 |
| 12 | BIE 3212 | Neurobiology | 3 | 0 | 3 | 4 |
| 13 | BIE 3213 | Cancer Biology | 3 | 0 | 3 | 4 |
| 14 | BIE 3214 | Enzyme Technology | 3 | 0 | 3 | 4 |
| 15 | BIE 3215 | Virology | 3 | 0 | 3 | 4 |
| 16 | BIE 3216 | Artificial Organ Technology | 3 | 0 | 3 | 4 |
| 17 | BIE 3217 | Immunology | 3 | 0 | 3 | 4 |
| 18 | BIE 3218 | Living Cell Culture | 3 | 0 | 3 | 4 |
| 19 | BIE 3219 | Food Microbiology | 3 | 0 | 3 | 4 |
| 20 | BIE 3220 | Basic Image Processing Techniques | 3 | 0 | 3 | 4 |
| 21 | BIE 4201 | Human Body Dynamic | 3 | 0 | 3 | 4 |
| 22 | BIE 4202 | Medical Genetic | 3 | 0 | 3 | 4 |
| 23 | BIE 4203 | Human Physiology | 3 | 0 | 3 | 4 |
| 24 | BIE 4204 | Genomic and Proteomic | 3 | 0 | 3 | 4 |
| 25 | BIE 4205 | Biorobotic | 3 | 0 | 3 | 4 |
| 26 | BIE 4206 | Techniques of Genetic Engineering | 3 | 0 | 3 | 4 |
| 27 | BIE 4207 | Tissue and Organs Biomechanics | 3 | 0 | 3 | 4 |
| 28 | BIE 4208 | Biomarker and System | 3 | 0 | 3 | 4 |
| 29 | BIE 4209 | Molecular Genetic | 3 | 0 | 3 | 4 |
| 30 | BIE 4210 | Biosensors | 3 | 0 | 3 | 4 |
| 31 | BIE 4211 | Microbial Genetic | 3 | 0 | 3 | 4 |
| 32 | BIE 4212 | Computer Application in Bioinformatics | 3 | 0 | 3 | 4 |
| 33 | BIE 4213 | Cell Biology | 3 | 0 | 3 | 4 |
| 34 | BIE 4214 | Bioinformatics | 3 | 0 | 3 | 4 |
| 35 | BIE 4215 | Food Technology | 3 | 0 | 3 | 4 |
| 36 | BIE 4216 | Biopharmaceutic | 3 | 0 | 3 | 4 |
| 37 | BIE 4217 | Aquaculture | 3 | 0 | 3 | 4 |
| 38 | BIE 4218 | Bioprocesses Simulations | 3 | 0 | 3 | 4 |
| 39 | BIE 4219 | Biotechnological Applications | 3 | 0 | 3 | 4 |
| 40 | BIE 4220 | Neuroengineering | 3 | 0 | 3 | 4 |
| 41 | BIE 4221 | Environmental Biotechnology | 3 | 0 | 3 | 4 |
| 42 | BIE 4222 | Protein Design | 3 | 0 | 3 | 4 |
| 43 | BIE 4223 | Industrial Biotechnology | 3 | 0 | 3 | 4 |

# Bioengineering
# Undergraduates-Formal Education

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

| | | | | | | |
|---|---|---|---|---|---|---|
| 44 | BIE 4224 | Nanotechnology.and Nanoengineering | 3 | 0 | 3 | 4 |
| 45 | BIE 4225 | Bionanotechnology | 3 | 0 | 3 | 4 |
| 46 | BIE 4226 | Biomimetic | 3 | 0 | 3 | 4 |
| 47 | BIE 4227 | Biosignal Processing | 3 | 0 | 3 | 4 |
| 48 | BIE 4229 | RF and Electromagnetic Medical Device Technology | 3 | 0 | 3 | 4 |
| 49 | BIE 4231 | Biomedical Imaging Systems | 3 | 0 | 3 | 4 |
| 50 | CBU 4401 | Girişimcilik | 4 | 0 | 4 | 5 |
| 51 | BIE 4232 | Biomimicking with Liquid Crystals | 3 | 0 | 3 | 4 |
| 52 | BIE 4233 | Liquid Crystals in Biological Structures | 3 | 0 | 3 | 4 |
| 53 | BIE 4234 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 54 | BIE 4235 | Electrochemistry | 3 | 0 | 3 | 4 |
| 55 | BIE 4236 | Gene Cloning and Protein Expression | 3 | 0 | 3 | 4 |
| 56 | BIE 4237 | Plant Biotechnology | 3 | 0 | 3 | 4 |
| 57 | BIE 4238 | Plant Biology | 3 | 0 | 3 | 4 |
| 58 | BIE 4239 | R Basics - R Programming Language Introduction | 3 | 0 | 3 | 4 |
| 59 | BIE 4240 | Industrial Bioreactors and Scale-Up | 3 | 0 | 3 | 4 |
| 60 | BIE 4241 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 61 | BIE 4230 | Experimental Design and Optimization | 3 | 0 | 3 | 4 |
| | | **Total:** | **184** | **0** | **184** | **245** |


| | | | | | | |
|---|---|---|---|---|---|---|
| 44 | BIE 4224 | Nanotechnology.and Nanoengineering | 3 | 0 | 3 | 4 |
| 45 | BIE 4225 | Bionanotechnology | 3 | 0 | 3 | 4 |
| 46 | BIE 4226 | Biomimetic | 3 | 0 | 3 | 4 |
| 47 | BIE 4227 | Biosignal Processing | 3 | 0 | 3 | 4 |
| 48 | BIE 4229 | RF and Electromagnetic Medical Device Technology | 3 | 0 | 3 | 4 |
| 49 | BIE 4231 | Biomedical Imaging Systems | 3 | 0 | 3 | 4 |
| 50 | CBU 4401 | Girişimcilik | 4 | 0 | 4 | 5 |
| 51 | BIE 4232 | Biomimicking with Liquid Crystals | 3 | 0 | 3 | 4 |
| 52 | BIE 4233 | Liquid Crystals in Biological Structures | 3 | 0 | 3 | 4 |
| 53 | BIE 4234 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 54 | BIE 4235 | Electrochemistry | 3 | 0 | 3 | 4 |
| 55 | BIE 4236 | Gene Cloning and Protein Expression | 3 | 0 | 3 | 4 |
| 56 | BIE 4237 | Plant Biotechnology | 3 | 0 | 3 | 4 |
| 57 | BIE 4238 | Plant Biology | 3 | 0 | 3 | 4 |
| 58 | BIE 4239 | R Basics - R Programming Language Introduction | 3 | 0 | 3 | 4 |
| 59 | BIE 4240 | Industrial Bioreactors and Scale-Up | 3 | 0 | 3 | 4 |
| 60 | BIE 4241 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 61 | BIE 4230 | Experimental Design and Optimization | 3 | 0 | 3 | 4 |
| | | **Total:** | **184** | **0** | **184** | **245** |


**BIE 4001 – Technical Elective Courses - III**

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3201 | Biomechanics | 3 | 0 | 3 | 4 |
| 2 | BIE 3202 | Biomechatronics | 3 | 0 | 3 | 4 |
| 3 | BIE 3203 | Molecule Engineering | 3 | 0 | 3 | 4 |
| 4 | BIE 3204 | Orthopedy Engineering | 3 | 0 | 3 | 4 |
| 5 | BIE 3205 | Biopolymers | 3 | 0 | 3 | 4 |
| 6 | BIE 3206 | Bioreactor Kinetics and Design | 3 | 0 | 3 | 4 |
| 7 | BIE 3207 | Hazardous Waste Treatment Techniques | 3 | 0 | 3 | 4 |
| 8 | BIE 3208 | Biological Processes | 3 | 0 | 3 | 4 |
| 9 | BIE 3209 | Toxicology | 3 | 0 | 3 | 4 |
| 10 | BIE 3210 | Synthetic Biology | 3 | 0 | 3 | 4 |
| 11 | BIE 3211 | Ecology | 3 | 0 | 3 | 4 |
| 12 | BIE 3212 | Neurobiology | 3 | 0 | 3 | 4 |
| 13 | BIE 3213 | Cancer Biology | 3 | 0 | 3 | 4 |
| 14 | BIE 3214 | Enzyme Technology | 3 | 0 | 3 | 4 |
| 15 | BIE 3215 | Virology | 3 | 0 | 3 | 4 |
| 16 | BIE 3216 | Artificial Organ Technology | 3 | 0 | 3 | 4 |
| 17 | BIE 3217 | Immunology | 3 | 0 | 3 | 4 |
| 18 | BIE 3218 | Living Cell Culture | 3 | 0 | 3 | 4 |
| 19 | BIE 3219 | Food Microbiology | 3 | 0 | 3 | 4 |
| 20 | BIE 3220 | Basic Image Processing Techniques | 3 | 0 | 3 | 4 |
| 21 | BIE 4201 | Human Body Dynamic | 3 | 0 | 3 | 4 |
| 22 | BIE 4202 | Medical Genetic | 3 | 0 | 3 | 4 |

**BIE 4002 – Technical Elective Courses - IV**

| No | Code | Course | T | U | Credit | ECTS |
|---|---|---|---|---|---|---|
| 1 | BIE 3201 | Biomechanics | 3 | 0 | 3 | 4 |
| 2 | BIE 3202 | Biomechatronics | 3 | 0 | 3 | 4 |
| 3 | BIE 3203 | Molecule Engineering | 3 | 0 | 3 | 4 |
| 4 | BIE 3204 | Orthopedy Engineering | 3 | 0 | 3 | 4 |
| 5 | BIE 3205 | Biopolymers | 3 | 0 | 3 | 4 |
| 6 | BIE 3206 | Bioreactor Kinetics and Design | 3 | 0 | 3 | 4 |
| 7 | BIE 3207 | Hazardous Waste Treatment Techniques | 3 | 0 | 3 | 4 |
| 8 | BIE 3208 | Biological Processes | 3 | 0 | 3 | 4 |
| 9 | BIE 3209 | Toxicology | 3 | 0 | 3 | 4 |
| 10 | BIE 3210 | Synthetic Biology | 3 | 0 | 3 | 4 |
| 11 | BIE 3211 | Ecology | 3 | 0 | 3 | 4 |
| 12 | BIE 3212 | Neurobiology | 3 | 0 | 3 | 4 |
| 13 | BIE 3213 | Cancer Biology | 3 | 0 | 3 | 4 |
| 14 | BIE 3214 | Enzyme Technology | 3 | 0 | 3 | 4 |
| 15 | BIE 3215 | Virology | 3 | 0 | 3 | 4 |
| 16 | BIE 3216 | Artificial Organ Technology | 3 | 0 | 3 | 4 |
| 17 | BIE 3217 | Immunology | 3 | 0 | 3 | 4 |
| 18 | BIE 3218 | Living Cell Culture | 3 | 0 | 3 | 4 |
| 19 | BIE 3219 | Food Microbiology | 3 | 0 | 3 | 4 |
| 20 | BIE 3220 | Basic Image Processing Techniques | 3 | 0 | 3 | 4 |
| 21 | BIE 4201 | Human Body Dynamic | 3 | 0 | 3 | 4 |
| 22 | BIE 4202 | Medical Genetic | 3 | 0 | 3 | 4 |

# Bioengineering
# Undergraduates-Formal Education

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

| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | BIE 4203 | Human Physiology | 3 | 0 | 3 | 4 |
| 24 | BIE 4204 | Genomic and Proteomic | 3 | 0 | 3 | 4 |
| 25 | BIE 4205 | Biorobotic | 3 | 0 | 3 | 4 |
| 26 | BIE 4206 | Techniques of Genetic Engineering | 3 | 0 | 3 | 4 |
| 27 | BIE 4207 | Tissue and Organs Biomechanics | 3 | 0 | 3 | 4 |
| 28 | BIE 4208 | Biomarker and System | 3 | 0 | 3 | 4 |
| 29 | BIE 4209 | Molecular Genetic | 3 | 0 | 3 | 4 |
| 30 | BIE 4210 | Biosensors | 3 | 0 | 3 | 4 |
| 31 | BIE 4211 | Microbial Genetic | 3 | 0 | 3 | 4 |
| 32 | BIE 4212 | Computer Application in Bioinformatics | 3 | 0 | 3 | 4 |
| 33 | BIE 4213 | Cell Biology | 3 | 0 | 3 | 4 |
| 34 | BIE 4214 | Bioinformatics | 3 | 0 | 3 | 4 |
| 35 | BIE 4215 | Food Technology | 3 | 0 | 3 | 4 |
| 36 | BIE 4216 | Biopharmaceutic | 3 | 0 | 3 | 4 |
| 37 | BIE 4217 | Aquaculture | 3 | 0 | 3 | 4 |
| 38 | BIE 4218 | Bioprocesses Simulations | 3 | 0 | 3 | 4 |
| 39 | BIE 4219 | Biotechnological Applications | 3 | 0 | 3 | 4 |
| 40 | BIE 4220 | Neuroengineering | 3 | 0 | 3 | 4 |
| 41 | BIE 4221 | Environmental Biotechnology | 3 | 0 | 3 | 4 |
| 42 | BIE 4222 | Protein Design | 3 | 0 | 3 | 4 |
| 43 | BIE 4223 | Industrial Biotechnology | 3 | 0 | 3 | 4 |
| 44 | BIE 4224 | Nanotechnology.and Nanoengineering | 3 | 0 | 3 | 4 |
| 45 | BIE 4225 | Bionanotechnology | 3 | 0 | 3 | 4 |
| 46 | BIE 4226 | Biomimetic | 3 | 0 | 3 | 4 |
| 47 | BIE 4227 | Biosignal Processing | 3 | 0 | 3 | 4 |
| 48 | BIE 4229 | RF and Electromagnetic Medical Device Technology | 3 | 0 | 3 | 4 |
| 49 | BIE 4231 | Biomedical Imaging Systems | 3 | 0 | 3 | 4 |
| 50 | CBU 4401 | Girişimcilik | 4 | 0 | 4 | 5 |
| 51 | BIE 4232 | Biomimicking with Liquid Crystals | 3 | 0 | 3 | 4 |
| 52 | BIE 4233 | Liquid Crystals in Biological Structures | 3 | 0 | 3 | 4 |
| 53 | BIE 4234 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 54 | BIE 4235 | Electrochemistry | 3 | 0 | 3 | 4 |
| 55 | BIE 4236 | Gene Cloning and Protein Expression | 3 | 0 | 3 | 4 |
| 56 | BIE 4237 | Plant Biotechnology | 3 | 0 | 3 | 4 |
| 57 | BIE 4238 | Plant Biology | 3 | 0 | 3 | 4 |
| 58 | BIE 4239 | R Basics - R Programming Language Introduction | 3 | 0 | 3 | 4 |
| 59 | BIE 4240 | Industrial Bioreactors and Scale-Up | 3 | 0 | 3 | 4 |
| 60 | BIE 4241 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 61 | BIE 4230 | Experimental Design and Optimization | 3 | 0 | 3 | 4 |
| | | **Toplam:** | **184** | **0** | **184** | **245** |


| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | BIE 4203 | Human Physiology | 3 | 0 | 3 | 4 |
| 24 | BIE 4204 | Genomic and Proteomic | 3 | 0 | 3 | 4 |
| 25 | BIE 4205 | Biorobotic | 3 | 0 | 3 | 4 |
| 26 | BIE 4206 | Techniques of Genetic Engineering | 3 | 0 | 3 | 4 |
| 27 | BIE 4207 | Tissue and Organs Biomechanics | 3 | 0 | 3 | 4 |
| 28 | BIE 4208 | Biomarker and System | 3 | 0 | 3 | 4 |
| 29 | BIE 4209 | Molecular Genetic | 3 | 0 | 3 | 4 |
| 30 | BIE 4210 | Biosensors | 3 | 0 | 3 | 4 |
| 31 | BIE 4211 | Microbial Genetic | 3 | 0 | 3 | 4 |
| 32 | BIE 4212 | Computer Application in Bioinformatics | 3 | 0 | 3 | 4 |
| 33 | BIE 4213 | Cell Biology | 3 | 0 | 3 | 4 |
| 34 | BIE 4214 | Bioinformatics | 3 | 0 | 3 | 4 |
| 35 | BIE 4215 | Food Technology | 3 | 0 | 3 | 4 |
| 36 | BIE 4216 | Biopharmaceutic | 3 | 0 | 3 | 4 |
| 37 | BIE 4217 | Aquaculture | 3 | 0 | 3 | 4 |
| 38 | BIE 4218 | Bioprocesses Simulations | 3 | 0 | 3 | 4 |
| 39 | BIE 4219 | Biotechnological Applications | 3 | 0 | 3 | 4 |
| 40 | BIE 4220 | Neuroengineering | 3 | 0 | 3 | 4 |
| 41 | BIE 4221 | Environmental Biotechnology | 3 | 0 | 3 | 4 |
| 42 | BIE 4222 | Protein Design | 3 | 0 | 3 | 4 |
| 43 | BIE 4223 | Industrial Biotechnology | 3 | 0 | 3 | 4 |
| 44 | BIE 4224 | Nanotechnology.and Nanoengineering | 3 | 0 | 3 | 4 |
| 45 | BIE 4225 | Bionanotechnology | 3 | 0 | 3 | 4 |
| 46 | BIE 4226 | Biomimetic | 3 | 0 | 3 | 4 |
| 47 | BIE 4227 | Biosignal Processing | 3 | 0 | 3 | 4 |
| 48 | BIE 4229 | RF and Electromagnetic Medical Device Technology | 3 | 0 | 3 | 4 |
| 49 | BIE 4231 | Biomedical Imaging Systems | 3 | 0 | 3 | 4 |
| 50 | CBU 4401 | Girişimcilik | 4 | 0 | 4 | 5 |
| 51 | BIE 4232 | Biomimicking with Liquid Crystals | 3 | 0 | 3 | 4 |
| 52 | BIE 4233 | Liquid Crystals in Biological Structures | 3 | 0 | 3 | 4 |
| 53 | BIE 4234 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 54 | BIE 4235 | Electrochemistry | 3 | 0 | 3 | 4 |
| 55 | BIE 4236 | Gene Cloning and Protein Expression | 3 | 0 | 3 | 4 |
| 56 | BIE 4237 | Plant Biotechnology | 3 | 0 | 3 | 4 |
| 57 | BIE 4238 | Plant Biology | 3 | 0 | 3 | 4 |
| 58 | BIE 4239 | R Basics - R Programming Language Introduction | 3 | 0 | 3 | 4 |
| 59 | BIE 4240 | Industrial Bioreactors and Scale-Up | 3 | 0 | 3 | 4 |
| 60 | BIE 4241 | Microfluidics in Bioengineering Applications | 3 | 0 | 3 | 4 |
| 61 | BIE 4230 | Experimental Design and Optimization | 3 | 0 | 3 | 4 |
| | | **Toplam:** | **184** | **0** | **184** | **245** |

# Bioengineering
# Undergraduates-Formal Education

**Total** **Number of Courses: -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 3201 | Engineering Standards | 2 | 0 | 2 | 2 |
| 2 | SEC 3202 | Engineering Documentaries | 2 | 0 | 2 | 2 |
| 3 | SEC 3203 | History of Technology | 2 | 0 | 2 | 2 |
| 4 | SEC 3204 | Formation of Universe | 2 | 0 | 2 | 2 |
| 5 | SEC 3205 | Management | 2 | 0 | 2 | 2 |
| 6 | SEC 3206 | Environmental Problems and Management | 2 | 0 | 2 | 2 |
| 7 | SEC 3207 | Introduction to Sociology | 2 | 0 | 2 | 2 |
| 8 | SEC 3208 | Introduction to Psychology | 2 | 0 | 2 | 2 |
| 9 | SEC 3209 | Introduction to Philosophy | 2 | 0 | 2 | 2 |
| 10 | SEC 3210 | Introduction to Economy | 2 | 0 | 2 | 2 |
| 11 | SEC 3211 | Turkish Political History | 2 | 0 | 2 | 2 |
| 12 | SEC 3212 | NLP and Individual Development | 2 | 0 | 2 | 2 |
| 13 | SEC 3213 | Memory Improvement Techniques | 2 | 0 | 2 | 2 |
| 14 | SEC 3214 | Speed Reading | 2 | 0 | 2 | 2 |
| 15 | SEC 3215 | Expressive Communication and Writing | 2 | 0 | 2 | 2 |
| 16 | SEC 3216 | Report Writing Techniques | 2 | 0 | 2 | 2 |
| 17 | SEC 3217 | First Aid | 2 | 0 | 2 | 2 |
| 18 | SEC 3218 | Public Protection | 2 | 0 | 2 | 2 |
| 19 | SEC 3219 | German | 2 | 0 | 2 | 2 |
| 20 | SEC 3220 | French | 2 | 0 | 2 | 2 |
| 21 | SEC 3221 | Italian | 2 | 0 | 2 | 2 |
| 22 | SEC 3222 | Spanish | 2 | 0 | 2 | 2 |
| 23 | SEC 3223 | Russian | 2 | 0 | 2 | 2 |
| 24 | SEC 3224 | Chinese | 2 | 0 | 2 | 2 |
| 25 | SEC 3225 | Ottoman | 2 | 0 | 2 | 2 |
| 26 | SEC 3226 | English Speaking | 2 | 0 | 2 | 2 |
| 27 | SEC 3227 | Marbling | 2 | 0 | 2 | 2 |
| 28 | SEC 3228 | Painting | 2 | 0 | 2 | 2 |
| 29 | SEC 3229 | Photography | 2 | 0 | 2 | 2 |
| 30 | SEC 3230 | Music | 2 | 0 | 2 | 2 |
| 31 | SEC 3231 | Bridge | 2 | 0 | 2 | 2 |
| 32 | SEC 3232 | Chess | 2 | 0 | 2 | 2 |
| 33 | SEC 3233 | Folk Dances | 2 | 0 | 2 | 2 |
| 34 | SEC 3234 | Basketball | 2 | 0 | 2 | 2 |
| 35 | SEC 3235 | Voleyball | 2 | 0 | 2 | 2 |
| 36 | SEC 3236 | Tennis | 2 | 0 | 2 | 2 |
| 37 | SEC 3237 | Table Tennis | 2 | 0 | 2 | 2 |
| 38 | SEC 3238 | Swimming | 2 | 0 | 2 | 2 |
| 39 | SEC 3239 | Athetics | 2 | 0 | 2 | 2 |
| 40 | SEC 3240 | Healthy Dietary | 2 | 0 | 2 | 2 |
| 41 | SEC 3241 | Football | 2 | 0 | 2 | 2 |
| 42 | SEC 3242 | Handball | 2 | 0 | 2 | 2 |
| 43 | SEC 3243 | Percussion | 2 | 0 | 2 | 2 |
| 44 | SEC 3256 | Technology Management | 2 | 0 | 2 | 2 |
| 45 | SEC 3257 | Innovation Management | 2 | 0 | 2 | 2 |