* 1. **General information**

|  |  |  |  |
| --- | --- | --- | --- |
| **College** | Engineering | **Department** | Biomedical |

|  |  |  |
| --- | --- | --- |
| **Program Name** | **English** | Bachelor of Science in Biomedical Engineering |
| **Arabic** | **بكالوريوس العلوم في الهندسة الطبية الحيوية** |
| **Degree Awarded** | **English** | Bachelor of Science in Biomedical Engineering |
| **Arabic** | **بكالوريوس العلوم في الهندسة الطبية الحيوية** |

[**https://www.iau.edu.sa/en/colleges/college-of-engineering/programs/bachelor-of-science-in-biomedical-engineering**](https://www.iau.edu.sa/en/colleges/college-of-engineering/programs/bachelor-of-science-in-biomedical-engineering)

* 1. **Distribution of Courses according to the Semester**
* **Year 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 3** | | | | | | | | | | | | | | | | | | | | |
| # | **Course Code** | | **Course Title** | | **اسم المقرر** | | **Credit Units** | | **Credit Units** | | | | | | | **Contact Hours** | | | | **Prerequisites** |
| Theory | | Lab/Practical | | Clinic, Field … | | Theory | | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | ISLM 282 | | Islamic Ethics and Values | | الأخلاق والقيم الإسلامية | | 2 | | 2 | | 0 | | 0 | | 2 | | | 0 | 0 | None |
| 2 | MATH 261 | | Calculus (1) | | تفاضل وتكامل (1) | | 4 | | 4 | | 0 | | 0 | | 4 | | | 0 | 0 | None |
| 3 | PHYS 271 | | Physics (1) | | فيزياء (1) | | 4 | | 3 | | 1 | | 0 | | 3 | | | 2 | 0 | None |
| 4 | CHEM 221 | | General Chemistry | | كيمياء عامة | | 3 | | 2 | | 1 | | 0 | | 2 | | | 2 | 0 | None |
| 5 | ENG 251 | | Introduction to Engineering | | مقدمة الى الهندسة | | 1 | | 1 | | 1 | | 0 | | 1 | | | 0 | 0 | None |
| 6 | ENGL  211 | | English Composition | | انشاء انجليزي | | 3 | | 3 | | 0 | | 0 | | 3 | | | 0 | 0 | None |
| 7 | HUMN 201 | | Library Skills | | مهارات مكتبية | | 1 | | 1 | | 0 | | 0 | | 1 | | | 0 | 0 | None |
| **Total** | | | | | | | 18 | | 16 | | 2 | | 0 | | 16 | | | 4 | 0 |  |
| **Grand Total** | | | | | | | | | **18** | | | | | | **20** | | | | |
|  | | | | | | | | | | | | | | | | | | | | |
| **Level 4** | | | | | | | | | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | | **اسم المقرر** | | **Credit Units** | | **Credit Units** | | | | | | | **Contact Hours** | | | | | **Prerequisites** |
| Theory | | Lab/Practical | | Clinic, Field … | | Theory | | | Lab/Practical | | Clinic, Field … | **Course Code** |
| 1 | HIST 281 | History and Civilization of Kingdom | | تاريخ وحضارة المملكة العربية السعودية | | 2 | | 2 | | 0 | | 0 | | 2 | | | 0 | | 0 | None |
| 2 | COMP 212 | Computer Programming | | برمجة حاسب آلي | | 2 | | 1 | | 1 | | 0 | | 1 | | | 2 | | 0 | None |
| 3 | ENG 232 | Statics | | استاتيكا | | 3 | | 3 | | 0 | | 0 | | 3 | | | 0 | | 0 | PHYS 271 |
| 4 | ENG 222 | Engineering Drawings | | رسومات هندسية | | 3 | | 3 | | 0 | | 0 | | 3 | | | 0 | | 0 | None |
| 5 | MATH 262 | Calculus (2) | | حساب تفاضل وتكامل  (2) | | 4 | | 4 | | 0 | | 0 | | 4 | | | 0 | | 0 | MATH 261 |
| 6 | PHYS 272 | Physics (2) | | فيزياء (2) | | 4 | | 3 | | 1 | | 0 | | 3 | | | 2 | | 0 | PHYS 271 |
| **Total** | | | | | | 18 | | 16 | | 2 | |  | | 16 | | | 4 | | 0 |  |
| **Grand Total** | | | | | | | | **18** | | | | | | **20** | | | | | |

* **Year 3**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 5** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | HUMN 301 | Oral Communication & Public Speaking | تواصل لفظي وخطابة عامة | 1 | 0 | 1 | 0 | 1 | | 0 | 0 | ENGL 211 |
| 2 | MATH 331 | Differential Equations | معادلات التفاضلية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | MATH 262 |
| 3 | ENG 311 | Dynamics | ديناميكا | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | ENG 232 |
| 4 | BIOL 341 | Biology for Engineers | احياء للمهندسين | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | CHEM 221 |
| 5 | ENG 331 | Electrical Circuits | دوائر كهربائية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | PHYS 272 |
| 6 | COMP 361 | Advanced Computer Programming | برمجة حاسب متقدمة | 2 | 1 | 1 | 0 | 1 | | 2 | 0 | COMP 212 |
| **Total** | | | | 14 | 10 | 4 | 0 | 10 | | 8 | 0 |  |
| **Grand Total** | | | | | 14 | | | 18 | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 6** | | | | | | | | | | | | | | | | | | | |
| # | **Course Code** | | | **Course Title** | | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | | | **Prerequisites** | | |
| Theory | | Lab/Practical | Clinic, Field … | Theory | Lab/Practical | | Clinic, Field … | | **Course Code** | | |
| 1 | | BUS 381 | Entrepreneurship | | ريادة الاعمال | | 2 | 2 | 0 | | 0 | 2 | | 0 | 0 | NONE | | |
| 2 | MATH 302 | | | Linear Algebra | | جبر خطي | 3 | 3 | | 0 | 0 | 3 | 0 | | 0 | | MATH 262 | | |
| 3 | BIOL 302 | | | Physiology & Anatomy for Engineers | | علم التشريح ووظائف الأعضاء للمهندسين | 3 | 2 | | 1 | 0 | 2 | 2 | | 0 | | BIOL 341 | | |
| 4 | BIOL 342 | | | Biochemistry and Molecular Biology | | الكيمياء الحيوية والأحياء الجزيئية | 2 | 1 | | 1 | 0 | 1 | 2 | | 0 | | CHEM 221 | | |
| 5 | ENG 322 | | | Electronic Devices & Circuits | | الدوائر والأجهزة الإلكترونية | 3 | 2 | | 1 | 0 | 2 | 2 | | 0 | | ENG 331 | | |
| 6 | ENG 352 | | | Thermodynamics | | ديناميكا حرارية | 3 | 3 | | 0 | 0 | 3 | 0 | | 0 | | ENG 311 | | |
| 7 | BIOEN 312 | | | Foundation of Biomechanics | | اساسيات الميكانيكا الحيوية | 2 | 1 | | 1 | 0 | 1 | 2 | | 0 | | BIOL 341 | | |
| **Total** | | | | | | | 18 | 14 | | 4 | 0 | 14 | 8 | | 0 | | |  | |
| **Grand Total** | | | | | | | | 18 | | | | 22 | | | | | |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Summer Training (1)** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | BIOEN 333 | Summer Training (1) | التدريب الصيفي | 0 | 0 | 0 | 0 | 0 | 0 | 6 Weeks  -  5 Days per week  -  8 Hours per day | Dept. consent |
| **Total** | | | | 0 | 0 | 0 | 0 | 0 | 0 |  |
| **Grand Total** | | | | | 0 | | |  | | |  |

**Year 4**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 7** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | ENG 401 | Technical Writing | الكتابة الفنية | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | ENGL 211 |
| 2 | MATH 411 | Probability & Statistics | احتمال واحصاءات | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | MATH 302, MATH 331 |
| 3 | BIOEN 441 | Fluid Dynamics | ميكانيكا الموائع | 2 | 1 | 1 | 0 | 1 | | 2 | 0 | ENG 352 |
| 4 | ENG 451 | Digital Design | تصميم رقمي | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | ENG 322 |
| 5 | BIOEN 421 | Biomaterials | مواد حيوية | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | BIOL 341 |
| 6 | BIOEN 431 | Biomed. Electronics & Measurement | الالكترونيات والقياسات الطبية الحيوية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | BIOEN 461 |
| 7 | BIOEN 461 | Signals & Systems In BME | الإشارات والنظم في الهندسة الطبية الحيوية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | ENG 322 |
| **Total** | | | | 18 | 13 | 5 |  | 13 | | 10 |  |  |
| **Grand Total** | | | | | 18 | | | 23 | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 8** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | HUMN 402 | Research Methodology | منهجية البحث | 1 | 1 | 0 | 0 | 1 | | 0 | 0 | HUMN 201 |
| 2 | ENG 412 | Engineering Economics | اقتصاد هندسي | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | NONE |
| 3 | ENG 442 | Introduction to Communication Systems & Networks | مقدمة في نظم الاتصالات والشبكات | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | ENG 322 |
| 4 | BIOEN 432 | Biomed Instrumentation Design | تصميم الأجهزة الطبية الحيوية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | BIOEN 461 |
| 5 | BIOEN 442 | Microprocessors | المعالجات الدقيقة | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | ENG 451 |
| 6 | BIOEN 452 | Safety & Maintenance in Healthcare | السلامة والصيانة في الرعاية الصحية | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | NONE |
| 7 | MATH 472 | Numerical Methods | طرق عددية | 3 | 3 | 0 | 0 | 3 | | 0 | 0 | MATH 331 |
| **Total** | | | | 16 | 14 | 2 | 0 | 14 | | 4 | 0 |  |
| **Grand Total** | | | | | 16 | | | 18 | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Summer Training (2)** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | BIOEN 444 | Summer Training (2) |  | 0 | 0 | 0 | 0 | 0 | 0 | 6 Weeks  -  5 Days per week  -  8 Hours per day | Dept. consent |
| **Total** | | | | 0 | 0 | 0 | 0 | 0 | 0 |  |
| **Grand Total** | | | | | 0 | | |  | | |  |

**Year 5**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 9** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | HUMN 501 | Professional Practice and Ethics | الممارسة المهنية  وعلم الاخلاق | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | ENG 412 |
| 2 | BIOEN 511 | Project Management | إدارة مشاريع | 1 | 1 | 0 | 0 | 1 | | 0 | 0 | NONE |
| 3 | BIOEN 521 | Design of Medical Devices | تصميم الأجهزة الطبية | 2 | 1 | 1 | 0 | 1 | | 2 | 0 | BIOEN 432 |
| 4 | BIOEN 531 | Senior Design Project (1) | مشروع تخرج (1) | 2 | 0 | 2 | 0 | 0 | | 4 | 0 | HUMN 402 |
| 5 | BIOEN 541 | Control Systems in BME | أنظمة التحكم في الهندسة الطبية الحيوية | 3 | 2 | 1 | 0 | 2 | | 2 | 0 | ENG 331 |
| 6 | BIOEN 462 | Biomedical Equipment | المعدات الطبية الحيوية | 4 | 3 | 1 | 0 | 3 | | 2 | 0 | BIOEN 431 |
| 7 | BIOEN 5xx | Elective (1) | مقرر اختياري (1) | 3 | 3 | 0 | 0 | 3 | | 0 | 0 | Dept. Consent |
|  | | | | 17 | 12 | 5 | 0 | 12 | | 10 | 0 |  |
| **Grand Total** | | | | | 17 | | | 22 | | | |

*\*Mention “IP” in credit units if the course completing in the next semester.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level 10** | | | | | | | | | | | | |
| # | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Credit Units** | | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | HUMN 502 | Global Business Culture | ثقافة اعمال دولية | 2 | 2 | 0 | 0 | 2 | | 0 | 0 | NONE |
| 2 | BIOEN 532 | Senior Design Project (2) | مشروع تخرج (2) | 4 | 0 | 4 | 0 | 0 | | 8 | 0 | BIOEN 531 |
| 3 | BIOEN 5xx | Elective (2) | مقرر اختياري (2) | 3 | 3 | 0 | 0 | 3 | | 0 | 0 | Dept. Consent |
| 4 | BIOEN 5xx | Elective (3) | مقرر اختياري (3) | 3 | 3 | 0 | 0 | 3 | | 0 | 0 | Dept. Consent |
| 5 | BIOEN 5xx | Elective (4) | مقرر اختياري (4) | 3 | 3 | 0 | 0 | 3 | | 0 | 0 | Dept. Consent |
| **Total** | | | | 15 | 11 | 4 | 0 | 11 | | 8 | 0 |  |
| **Grand Total** | | | | | 15 | | | 19 | | | |

\* Selection of elective course should be done under the supervision of student advisor

* **Elective Courses**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Course Code** | **Course Title** | **اسم المقرر** | **Credit Units** | **Semester** | **Credit Units** | | | **Contact Hours** | | | **Prerequisites** |
| Theory | Lab/Practical | Clinic, Field … | Theory | Lab/Practical | Clinic, Field … | **Course Code** |
| 1 | BIOEN 513 | Biomedical Digital Signal Processing | معالجة الإشارات الطبية الحيوية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 2 | BIOEN 585 | Medical Laser | الليزر الطبي | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 3 | BIOEN 553 | Medical Image Processing & Communication | الاتصالات ومعالجة الصور الطبية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 4 | BIOEN 504 | Introduction to Biomedical Optics | مقدمة في علم البصريات الطبية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 5 | BIOEN 561 | Advanced Topics in Biomedical Engineering | موضوعات متقدمة في الهندسة الطبية الحيوية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
|  | BIOEN 553 | Biomedical Imaging Systems | أنظمة التصوير الطبية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
|  | BIOEN 573 | Magnetic Resonance Imaging | التصوير بالرنين المغناطيسي | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 7 | BIOEN 523 | Biomedical Electromagnetics | الكهرومغناطيسية الطبية الحيوية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 8 | BIOEN 563 | Medical Image processing and communication  Communication | الاتصال ومعالجة الصور الطبية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 9 | BIOEN  583 | Ultrasound | التصوير بالموجات الصوتية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 10 | BIOEN 593 | X-ray and CT | الاشعة المقطعية واشعة اكس | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 11 | BIOEN 554 | Software Engineering | هندسة البرمجيات | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 13 | BIOEN 594 | Introduction to Safety Engineering | مقدمة قي هندسة الامان | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |

*\*Include elective courses in separate tables as groups (if needed)*