* 1. **General information**

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

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| --- | --- | --- |
| **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**

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| --- |
| **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 | ENGL211 | 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 |

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| **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 |  |

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| **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**

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| **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 |

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| **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 |

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| --- |
| **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**

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| **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.*

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| **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 communicationCommunication | الاتصال ومعالجة الصور الطبية | 3 |  | 3 | 0 | 0 | 3 | 0 | 0 | Dept. Consent |
| 9 | BIOEN583  | 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)*