**BMED3302 BIOMEDICAL INSTRUMENTATION II  
COURSE CATALOG INFO**

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| **Course Code :**BMED3302 | | | | | **Course Name :**Biomedical instrumentation II | | | |
| **Semester** | | **Lecture + Laboratory + PS** | **Local Credit** | **ECTS** | **Language** | **Category** | **Instructional Methods** | **Prerequisites** |
|  | | (2+2+0) | 3 | 5 | English | Core | Course | BMED3301 |
| **Course Content** | | | | Basic principles related to physiological pressure measurements and phonocardiography . Measurement techniques of blood flow and volume of blood flow. Human respiratory system and its measurements. Chemical sensors. Measurement systems of clinical laboratory. Medical imaging systems; radiography, computed tomography (CT), magnetic resonance imaging (MRI), ultrasonography. Therapeutic and prosthetic devices: cardiac pacemaker, defibrillators, heart-lung pumps, hemodialysis systems. Operating rooms and electrosurgery systems. Electrical safety. | | | | |
| **Course Outcomes** | | | | **CO 1.** Explain the working principles of biosensor systems, identify techniques and devices used to measure blood pressure and heart sounds, methods used to measure blood flow and blood volume, parameters used for diagnostic purposes in human respiratory system, and respiratory tests used in clinical laboratories, scanned parameters and the devices used in detection and measurement of these parameters.  **CO 2.** Identify medical imaging devices used in imaging and diagnosis of various diseases and their working principles.  **CO 3.** Identify the devices used for therapeutic and prosthetic purposes, providing support for the normal functioning of structures such as tissues and organs that have lost their function or cannot function properly.  **CO 4.** Identify the electrical safety issues.  **CO 5.** Work as a responsible member with the practical experiments performed in laboratories and develop data collection, data analysis and interpretation skills. | | | | |
|  | **Program Outcomes** | | | | | | | |
| **PO1** | Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.), health science (anatomy and physiology) and computer science (programming and simulation); ability to use theoretical and applied knowledge in these areas in complex engineering problems. | | | | | | | |
| **PO2** | Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. | | | | | | | |
| **PO3** | Ability to design and integrate components of a complex system or process, as they relate to Biomedical Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements; ability to apply modern design methods. | | | | | | | |
| **PO4** | Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. | | | | | | | |
| **PO5** | Ability to design and conduct experiments, gather, analyze and interpret data. | | | | | | | |
| **PO6** | Ability to work in intra-disciplinary and multi-disciplinary teams; ability to take individual responsibilities. | | | | | | | |
| **PO7** | Ability to effectively communicate in Turkish, ability to express his/her knowledge, ideas and work in English via oral, written and visual means; ability to write effective reports and comprehend written reports; ability to give and follow instructions. | | | | | | | |
| **PO8** | Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself | | | | | | | |
| **PO9** | Consciousness to behave according to ethical principles, and about professional and ethical responsibility; knowledge on standards used in engineering practice. | | | | | | | |
| **PO10** | Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development. | | | | | | | |
| **PO11** | Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions. | | | | | | | |

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| **CONTRIBUTION OF COURSE OUTCOMES ON BIOMEDICAL ENGINEERING PROGRAM OUTCOMES** | | | | | |
| **Course\Program** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **PO1** | x |  |  |  |  |
| **PO2** |  | x | x |  |  |
| **PO3** |  |  |  |  |  |
| **PO4** |  |  |  |  |  |
| **PO5** |  |  |  | x | x |
| **PO6** |  |  |  | x | x |
| **PO7** |  |  |  |  |  |
| **PO8** |  |  |  |  |  |
| **PO9** |  |  |  |  |  |
| **PO10** |  |  |  |  |  |
| **PO11** |  |  |  |  |  |

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| **COURSE ASSESMENT AND ECTS WORK LOAD** | | | |
| **Type of Work** | **Count** | **ECTS WORK LOAD** | |
| **Time (Hour)(Including prep. time)** | **Work Load** |
| Attendance | 14 | 2 | 28 |
| Final Exam | 1 | 2 | 2 |
| Quizzes |  |  | 0 |
| Term project |  |  | 0 |
| Reports |  |  | 0 |
| Final Project |  |  | 0 |
| Seminar |  |  | 0 |
| Assignments |  |  | 0 |
| Presentation |  |  | 0 |
| Midterms |  |  | 0 |
| Project |  |  | 0 |
| Laboratory | 14 | 2 | 28 |
| Tutorial |  | 0 | 0 |
| Other(Self study) |  |  | 0 |
|  | | **Total work load** | 58 |
|  | | **Total work load/25** | 2.32 |
|  | | **ECTS Credit** | 2 |