**Course Description Form**

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| 1. Course Name: biosensor
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| 1. Course Code: WBM-52-08
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| 1. Semester / Year: second \ fifth year
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| 1. Description Preparation Date: 19/3/2024
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| 1. Available Attendance Forms:
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|  |
| 1. Number of Credit Hours (Total) / Number of Units (Total)
 |
| 45 hours  |
| 1. Course administrator's name (mention all, if more than one name)
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| Name: Email:  |
| 1. Course Objectives
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| **Course Objectives** | * **1- Identify the basic parts of the medical sensor and how to manufacture it**
* **2- How medical allergens develop over time**
* **3- Knowing the types of medical allergens**
* **4- Classification of medical allergens according to use**
* **5- The purpose of using medical sensors with the human body**
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| 1. Teaching and Learning Strategies
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| **Strategy** | 1- Theoretical lectures. Using the whiteboard and data show.2- Discussion lectures Tutorials.3- Practical experiments in laboratories.4- Homework assignments. |
| 1. Course Structure
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| **Week**  | **Hours**  | **Required Learning Outcomes**  | **Unit or subject name**  | **Learning method**  | **Evaluation method**  |
| First | 3 | Definition, characteristics, principles, and requirements. | Definition, characteristics, principles, and requirements. | theory | Daily test and oral questions |
| Second  | 3 | Electrodes and definition | Electrodes and definition | theory | Daily test and oral questions |
| Third  | 3 | electronic CCT and types. | electronic CCT and types. | theory | Daily test and oral questions |
| Fourth | 3 | Surface electrodes | Surface electrodes | theory | Daily test and oral questions |
| Fifth | 3 | Needle electrodes | Needle electrodes | theory | Daily test and oral questions |
| Sixth | 3 | Transducers and properties. | Transducers and properties. | theory | Daily test and oral questions |
| Seventh | 3 |  |  | theory | Daily test and oral questions |
| Eighth  | 3 | Resistive transducers and thermometric transducers. | Resistive transducers and thermometric transducers. | theory | Daily test and oral questions |
| ninth | 3 | Medical applications | Medical applications | theory | Daily test and oral questions |
| tenth | 3 | Piezoelectric  | Piezoelectric  | theory | Daily test and oral questions |
| eleventh | 3 | ultrasound transducers | ultrasound transducers | theory | Daily test and oral questions |
| twelveth | 3 | Mechanical transducers, and medical applications. | Mechanical transducers, and medical applications. | theory | Daily test and oral questions |
| Thirteenth | 3 |  |  | theory | Daily test and oral questions |
| fourteenth | 3 | Chemical transducers and medical applications  | Chemical transducers and medical applications  | theory | Daily test and oral questions |
| fifteenth | 3 | pressure measurement transducers. | pressure measurement transducers. | theory | Daily test and oral questions |
| 1. Course Evaluation
 |  |  |  | theory | Daily test and oral questions |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc  |  |  |  | theory |
| 1. Learning and Teaching Resources
 |  |  |  | theory |
| Required textbooks (curricular books, if any) | Wang, P., & Liu, Q. (2017). Biomedical sensors and measurement. Springer Science & Business Media. |  |  | theory |
| Main references (sources) | 1. Wang, P., & Liu, Q. (2017). Biomedical sensors and measurement. Springer Science & Business Media.
2. Introduction to Biomedical Engineering, Joseph D. Bronzino, 3rd Ed. 2012, Academic Press.
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| Recommended books and references (scientific journals, reports...) | Standard handbook of biomedical sensors |
| Electronic References, Websites | https://books.google.iq/books/about/Handbook\_of\_Biomedical\_sensors.html?id=GyNprgEACAAJ&redir\_esc=y |