

Course Description Form

1. Course Name:	
Modern Medical Equipment	
2. Course Code:	
WBM-52-02	
3. Semester / Year:	
2 nd Semester / 2025	
4. Description Preparation Date:	
19/3/2025	
5. Available Attendance Forms:	
Weekly (Theoretical)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
45 Hrs. Theoretical / 2 Unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Hayder A. Yousif Email: hayder.ab@uowa.edu.iq	
8. Course Objectives	
Course Objectives	<ol style="list-style-type: none"> 1. Identify the medical devices implanted in the human body 2. How to design the part to be implanted in the human body According to the nature of the planting 3. Learn about open heart surgeries and pulmonary resuscitation 4. How to use the artificial heart, its benefits and harms 5. Knowledge of manufactured heart valves 6. Study the dialysis process and how to use artificial kidneys
9. Teaching and Learning Strategies	
Strategy	To make the student able to understand the working principle of the modern medical device and its dealings with the human body, and to graduate engineers

specialized in the field of biomedical engineering, which relates to human life with the medical device and work in the medical engineering environment.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Identifying prosthetic organs	Artificial Organs and Prosthetic Devices	Theoretical	Daily test and oral questions
2	3	Learn how to perform open heart surgery	Heart-Lung Machine	Theoretical	Daily test and oral questions
3	3	Identify the types of blood pumps	Peristaltic Head Pump	Theoretical	Daily test and oral questions
4	3	Know the requirements for designing medical pumps	Major Design Considerations	Theoretical	Daily test and oral questions
5	3	Study of the artificial heart and its supporting devices	Artificial Hearts and Ventricular Assist Devices (VADs)	Theoretical	Daily test and oral questions
6	3	Identify the causes of heart failure during surgery	Heart Failure	Theoretical	Daily test and oral questions
7	3	Know the basics about the artificial heart	AbioCor Artificial Heart, and Basic Components	Theoretical	Daily test and oral questions
8	3	Identifying the artificial kidney and the dialysis process	Artificial Kidney and Dialysis System	Theoretical	Daily test and oral questions
9	3	Learn how to calculate the time required for the blood filtration process	Prediction of Time required for dialysis, and Diffusion.	Theoretical	Daily test and oral questions
10	3	Study the rules of blood filtering	Role of Ultrafiltration	theoretical	Daily test and oral questions
11	3	Study of the dialysis machine	Hemodialysis Machine	Theoretical	Daily test and oral questions
12 & 13	3	Pacemaker study	Artificial Pacemakers	theoretical	Daily test and oral questions
14	3	Learn how to install medical electrodes	Pulse Generator, Pacing Leads and Electrodes, Sensing Circuits	Theoretical	Daily test and oral questions

15	3	Study of electrical circuits related to modern medical equipment	Timing Circuits, Power Source, Telemetry Circuit, and Programmers	Theoretical	Daily test and oral questions
11. Course Evaluation					
1- Weekly exams 2- Monthly exams 3- Participations inside the class 4- Present the seminars					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Introduction to Biomedical Engineering, Joseph D. Bronzino, 3 rd Ed. 2012, Academic Press.		
Main references (sources)			<ol style="list-style-type: none"> 1. Introduction to Biomedical Engineering, Joseph D. Bronzino, 3rd Ed. 2012, Academic Press. 2. Medical Devices and Systems, Joseph D. Bronzino, 1st Ed. 2006, CRC, Taylor & Francis. The Biomedical Engineering Handbook, Joseph D. Bronzino, 4 th Ed. 2015, CRC Press.		
Recommended books and references (scientific journals, reports...)			Standard handbook of biomedical engineering & design - M Kutz		
Electronic References, Websites			https://books.google.iq/books/about/Handbook_of_Biomedical_Instrumentation		