Course Description Form

1. Course Name:
Biomaterial I
2. Course Code:
WBM-41-02
3. Semester / Year:
Semester 1/ 4th
4. Description Preparation Date:
2024-09-19
5. Available Attendance Forms:
presence in the classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Odea Email: ahmed.odea@uowa.iq

8. Course Objectives	
Course Objectives	Biomaterials are used in medical devices and a broad range of health care products. The goal of studying biomaterials is to understand how the body's natural tissues are organized on a compositional, structural, and properties basis

9. Teaching and Learning Strategies	
Strategy	1- Classification of biological materials used in medicine and their special requirements 2- An understanding of the concept of biocompatibility and methods for testing biomaterials 3- A description and explanation of the surfaces of biological materials and the different methods of analysis 4- Understand ways to improve biocompatibility and practical aspects of biomedical devices: sterilization, manufacturing, clinical trials and ethical issues. 5- Analysis of permanent and biodegradable agriculture by referring case studies

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction	Introduction , Histo of Biomaterials Knowledge Develop Biomateri , basics biomaterials synthesis, characterization, testing, applications	Lectures presented in PDF format	Daily exams + homework assignments + monthly exams
2	2	uses of Biomaterials	uses of Biomaterials, How are biomaterials used in current medic practice, New examples of biomaterials application, classification of biomaterials	Lectures presented in PDF format	Daily exams homework assignments monthly exam
3	2	Selection of Biomedical materials Evaluation	Selection of Biomedical materials Evaluation (polymers, Metals, Composite Ceramics. Selection parameters for biomaterials. Analysis of the problem; Consideration of requirement; Consideration of available material and their properties leading to. Choice of material.	Lectures presented in PDF format	Daily exams homework assignments monthly exam
4	2	Subjects are important to Biomaterials	Subjects are important to Biomaterials science, Bio-ceramics, Types of Bio-ceramics – Tissue Attachment, Nearly Inert Crystalline Bio ceramics.	Lectures presented in PDF format	Daily exams homework assignments monthly exam
5	2	Porous	Porous	Lectures	Daily exams

		Ceramics	Ceramics, Bioactive Glasses and Glass-Ceramics	presented in PDF format	homework assignments monthly
6	2	Biodegradable Materials,	Biodegradable Materials, Resorbable Ceramics, Resorbable polymers, Resorbable metals,	Lectures presented in PDF format	Daily exams homework assignments monthly
7	2	Properties of Biomaterials	Properties of Biomaterials, Physical Properties, Impact of biomaterial surface physical properties on biological responses, Mechanical Properties of Biomaterials	Lectures presented in PDF format	Daily exams homework assignments monthly
8	2	Chemical Properties of Bio ceramics	Chemical Properties of Bio ceramics, Impact of biomaterial surface chemical properties on biological responses, Solubility and Erosion, Leaching of Constituents, Corrosion	Lectures presented in PDF format	Daily exams homework assignments monthly
9	2	Polymer as Biomaterial	Polymer as Biomaterial, General Techniques, Materials in Maxillofacial	Lectures presented in PDF format	Daily exams homework assignments monthly

			Prosthetic, Latexes, Polyurethane polymers, Acrylic Resins, Resin Teeth for Prosthodontics' Applications		
10	2	Polymer as Biomaterial	synthesis, testing and applications of polymers	Lectures presented in PDF format	Daily exams homework assignments monthly
11	2	Metals and Alloys	Metals and Alloys, Stainless Steels, CoCr Alloys, Titanium and its Alloys	Lectures presented in PDF format	Daily exams homework assignments monthly
12	2	Metals and Alloys	synthesis, testing and applications of Metals and Alloys	Lectures presented in PDF format	Daily exams homework assignments monthly
13	2	biomaterials characterization	biomaterials characterization, Physical and chemical characterizations , Mechanical characterization of biomaterials, Surface characterization of biomaterials	Lectures presented in PDF format	Daily exams homework assignments monthly
14	2	Corrosion	Defined and form of corrosion	Lectures presented in PDF format	Daily exams homework assignments monthly
15		Final exam			

11. Course Evaluation

- Daily exams with practical and scientific questions.
- Participation scores for difficult competition questions among students
- Establishing grades for environmental duties and the reports assigned to them
- Semester exams for the curriculum, in addition to the mid-year exam and final exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Biomaterials Science: An Introduction to Materials in Medicine
Main references (sources)	Biomaterials Science: An Introduction to Materials in Medicine
Recommended books and references (scientific journals, reports…)	An Introduction to Tissue-Biomaterial Interactions