Module Definition Form (MDF)

Module code: MOD009724	**Version:** 1 **Date Amended:** 27/Feb/2024

1. Module Title
Biomaterials

2a. Module Leader
Adil Mustafa

2b. School
School of Engineering and the Built Environment

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:			

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Biomaterials uses material science principles to create implants that can be utilised inside the human body, and here you'll be introduced to various important categories of Biomaterials, for example, metals, ceramics, polymers and composites in addition to the interaction of biomaterials-tissue upon implantation. The ethics behind Biomaterials and Biomedical Engineering, in general, are discussed. Students are then introduced to the Biomedical Engineering laboratories. You'll have the opportunity to listen to a Guest Lecturer visiting a biomaterial-related company to discuss their work, which will give you a better insight into the clinical applications of different types of implants.

The module has been designed to help you develop a variety of laboratory skills (using equipment, documenting experiments, considering potential health and safety concerns/risks) and research skills (working in teams, writing research reports, and giving oral presentations).

6b. Outline Content

Topics specific to Biomaterials:

· Introduction to Materials Science

. Introducing common types and uses of Biomaterials and their applications; Metals, ceramics and Polymers

· Different classes of sustainable biomaterials

. Understanding important topics relevant to Biomaterials (for example toxicology, mechanical performance requirements, legal regulations and standards)

· Biological evaluations on medical implants (biocompatibility assessments)

· Conducting mechanical and materials testing on biomaterials

Topics not specific to Biomaterials:

· Learning how to make efficient use of the Library resources

· Introducing the laboratories, laboratory equipment, and associated health and safety/risk concerns

· Understanding the importance of ethics within Biomedical Engineering and exploring the university's ethics application process

· Practicing writing group research reports on performed experiments

· Learning how self-reflection can be used to continually improve skills

· Receiving feedback on oral presentations and written coursework

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources
Scalpels, lab coats, safety goggles Computers Bioprinter Mechanical testing machine

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Demonstrate knowledge of the various types of Biomaterials and their characteristics.
2	Knowledge and Understanding	Demonstrate an understanding of the applications of Biomaterials for different medical applications.
3	Intellectual, practical, affective and transferrable skills	Apply relevant and safe laboratory manipulative skills and techniques while conducting materials and mechanical tests.
4	Intellectual, practical, affective and transferrable skills	Apply skills in research, problem-solving, communication, information retrieval, and the effective use of general IT facilities.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	18	1-2	Lectures 1.5 hrs x 12 weeks
Other teacher managed learning	18	3-4	1.5 hrs x 12 weeks- Workshops, seminars, or project work
Student managed learning	114	1-4	Students are expected to undertake self-directed study. These hours include time spent on assignments, reading sections from the recommended texts and self-managed learning.
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-2	30 (%)	Fine Grade	30 (%)
1 hr in class test					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Coursework	3-4	70 (%)	Fine Grade	30 (%)
15 minute presentation (LO4) and 1500 words report (LO1-4)					

Assessment components for Element 011				
Component No.	**Assessment Title**	**Submission Method**	**Weighting (%)**	**Components needed for Mark Calculation?**
011/1	Research Coursework 15 min presentation	Canvas	40 (%)	All
011/2	Lab report 1500 words	Canvas	60 (%)	

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]