

Course Description Form

1. Course Name:
BioTribology
2. Course Code:
WBM-52-06
3. Semester / Year:
Second/ 2026
4. Description Preparation Date:
16/2/2026
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
45h
7. Course administrator's name (mention all, if more than one name)
Nataq Aziz Omran
8. Course Objectives
1. Understand the fundamentals of biotribology and its various applications in biomedical fields. 2. Differentiate between surface types, their interactions, and the materials used in implants and prosthetics. 3. Analyze and justify the selection of biomaterials used in medical implants and joint replacements. 4. Calculate and measure friction coefficients and lubrication characteristics for different materials and surfaces. 5. Identify wear mechanisms affecting human joints and evaluate the quality and suitability of prosthetic components. 6. Develop practical skills in selecting appropriate materials for specific joint applications and distinguishing between commonly used biomedical materials.
7. Teaching and Learning Strategies
1. The prescribed textbook and lecture materials. 2. The instructor delivers detailed theoretical lectures. 3. Students participate during lectures by solving selected practical problems. 4. Adoption of blended e-learning methods.

5. Course Structure				
Week	Hours	Unit or subject name and required learning outcomes	Learning method	Evaluation method
1	2 theoretical	Introduction to Biotribology	History of Biotribology	Daily Quiz + Discussion
2	2 theoretical	Types of Surfaces	Types of Surfaces	Daily Quiz + Discussion
3	2 theoretical	Friction calculations	Calculation of Friction Values	Daily Quiz + Discussion
4	2 theoretical	Types of friction	Types of Friction	Daily Quiz + Discussion
5	2 theoretical	Laws of static and dynamic friction	Laws of Static and Kinetic Friction	Daily Quiz + Discussion
6	2 theoretical	Theories and types of wear	Theories and Types of Wear	Daily Quiz + Discussion
7	2 theoretical	Wear measurements	Measurement and Calculation of Wear	Daily Quiz + Discussion
8	2 theoretical	Friction and wear measurement	Measurement of Friction and Wear	Daily Quiz + Discussion
9	2 theoretical	Lubrication mechanism	Lubrication Mechanisms	Daily Quiz + Discussion
10	2 theoretical	Hydrodynamic lubrication	Hydrodynamic Lubrication	Daily Quiz + Discussion
11	2 theoretical	Elastic hydro dynamic lubrication	Lubrication in Elastomeric Systems	Daily Quiz + Discussion

12	2 theoretical	Human joints	Anatomy and Structure of Human Joints	Daily Quiz + Discussion
13	2 theoretical	Lubrication of human joints	Natural Lubrication of Human Joints	Daily Quiz + Discussion
14	2 theoretical	Bio tribology of artificial joints	Friction in Artificial Joints	Daily Quiz + Discussion
15	2 theoretical	Lubrication of artificial joints	Lubrication Methods in Artificial Joints	Daily Quiz + Discussion

6. Course Evaluation

1. Daily quizzes that include both practical and theoretical questions.
2. Participation marks awarded for competitive and challenging questions among students.
3. Grades assigned for homework and required reports.
4. Daily and monthly examinations covering the syllabus, in addition to the final exam.

5. Learning and Teaching Resources

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Head of the Department

Dr. Osama Abdulbari



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