Course Description Form

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| 1. Course Name |
| / BioTribology |
| 2. Course Code |
| WBM-52-06 |
| 3. Semester/Year |
| Quarterly |
| 4. Date of preparation of this description |
| 19/4/2024 |
| 5. Available attendance forms |
| Weekly (theoretical) |
| 6. Number of credit hours (total) / total number of units |
| 30 hours theoretical & 30 hours practical / 3units |
| 7. Course Administrator Name |
| Name: Eng. Natiq Aziz Omran                 Email:Natikaziz81@gmail.com |

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| **Course Objectives** |
| Bio-Tribology is the science of friction, lubrication and wear when applied tobiological systems or natural phenomena. It is a diverse and multidisciplinary field which impacts all aspects of our daily life from prosthetic implants to personal care products. |

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| A- Knowledge ObjectivesA1- The student should be introduced to the science of biotribology and its multiple applicationsA2- The student should distinguish between surfaces, their types and different ways of interactionA3- The student should explain the difference in the materials used in the crops and compensation.A4- The student should be able to calculate the values of friction and lubrication of various surfacesA5- The student should evaluate the quality of the parties used and their proportionality with the user. |
| B - Course skills objectivesB1 – The student should measure the coefficient of friction of different materialsB2 – The student should notice corrosion and its types affecting the joints of the human bodyB3 – The student should choose the appropriate material for the appropriate jointB4- The student should differentiate between the medical materials used in the manufacture of crops and compensation. |
| **Teaching and learning methods**ü Methodological book and lectures.ü The teacher gives detailed theoretical lecturesü Participation of students during the lecture to solve some practical problems.ü Use of blended e-learning methods.       |
| **Evaluation methods** |
| ü Daily exams with practical and scientific questions.ü Participation grades for difficult competition questions among students.ü Setting grades for homework and reports assigned to them.ü Daily and monthly exams for the curriculum in addition to the end-of-semester exam. |
| **C- Emotional and value goals**       Leading human resources in accordance with professional and ethical standards.       Raising graduates on the principles of ethical and financial integrity.       Encourage students to work hard and consider themselves future leaders. |
| **d. General and Transferable Skills (Other Skills Related to Employability and Personal Development.**D1- Diagnosis of the percentage of wear in implants and jointsD2- Dealing with friction and corrosion measuring devices for implants and jointsD3- Work efficiently within the medical team during joint replacement operations |

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| **Course Structure** |
| The week | Hours | Required Learning Outcomes | Name of the unit/course or topic | Method of education | Evaluation method |
| 1 | 2 Theoretical | Recognize the history of biotribology | Introduction to Biotribology | theoretical | Daily exam + discussion |
| 2 | 2 Theoretical | Recognize surface types | Types of Surfaces | theoretical | Daily exam + discussion |
| 3 | 2 Theoretical | Learn to calculate friction values | Friction calculations | theoretical | Daily exam + discussion |
| 4 | 2 Theoretical | Identify the types of friction | Types of friction | theoretical | Daily exam + discussion |
| 5 | 2 Theoretical | Learn the laws of static and moving friction, | Laws of static and dynamic friction | theoretical | Daily exam + discussion |
| 6 | 2 Theoretical | Identify theories and types of corrosion | Theories and types of wear | theoretical | Daily exam + discussion |
| 7 | 2 Theoretical | Learn to measure and calculate corrosion | Wear measurements | theoretical | Daily exam + discussion |
| 8 | 2 Theoretical | Learn to measure friction and wear | Friction and wear measurement | theoretical | Daily exam + discussion |
| 9 | 2 Theoretical | Recognize the lubrication mechanism | Lubrication mechanism | theoretical | Daily exam + discussion |
| 10 | 2 Theoretical | Identify hydrodynamic lubrication | Hydrodynamic lubrication | theoretical | Daily exam + discussion |
| 11 | 2 Theoretical | Recognition of lubrication for rubber systems | Elastic hydro dynamic lubrication | 11 | 2 Theoretical |
| 12 | 2 Theoretical | Identify the anatomy and structure of the joints of the human body | Human joints | theoretical | Daily exam + discussion |
| 13 | 2 Theoretical | Identify the natural lubrication of human joints | Lubrication of human joints | theoretical | Daily exam + discussion |
| 14 | 2 Theoretical | Recognition of friction in artificial joints | Bio tribology of artificial joints | theoretical | Daily exam + discussion |
| 15 | 2 Theoretical | Learn about methods of lubrication of artificial joints | Lubrication of artificial joints | theoretical | Daily exam + discussion |

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| 1- Required textbooks: |        Biotribology by J. Paulo Davim, 2013 |
| 2- Main references (sources) | ü Biotribology by J. Paulo Davim, 2013 |
| A- Recommended books and references (scientific journals, reports,.......) | Journal of Biotribology, ISSN 2352-5738 |
| B- Electronic References, Websites | Websites of joint manufacturing companies and medical implants |