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 to  biological 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 Objectives  A1- The student should be introduced to the science of biotribology and its multiple applications  A2- The student should distinguish between surfaces, their types and different ways of interaction  A3- 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 surfaces  A5- The student should evaluate the quality of the parties used and their proportionality with the user. |
| B - Course skills objectives  B1 – The student should measure the coefficient of friction of different materials  B2 – The student should notice corrosion and its types affecting the joints of the human body  B3 – The student should choose the appropriate material for the appropriate joint  B4- 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 lectures  ü 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 joints  D2- Dealing with friction and corrosion measuring devices for implants and joints  D3- 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 |