

[GBK202] MECHANICAL DESIGN OF MEDICAL EQUIPMENT

GENERAL INFORMATION

Studies	DEGREE IN BIOMEDICAL ENGINEERING	Subject	?
Semester	1	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	4,5	Language	ENGLISH
		Total hours	69.5 class hours + 43 non-class hours = 112.5 total hours

PROFESSORS

TENA MERINO, IOSU

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
GRAPHIC EXPRESSION I	Mechanical Design
GRAPHIC EXPRESSION II	2D/3D design software (SolidWorks)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GBR305 - To evaluate the mechanical needs of different medical equipment		x		3,78
G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and /or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		0,4
G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		0,32
Total:				4,5

KC: Knowledge or Content / SK: Skills / AB: Abilities

CONTENTS

- Kinematic chain modelling:
 - Modelling principles
 - Mechanical transmissions
 - Steady-state vs. transient conditions
- Dimensioning of machine elements:
 - Rolling elements:
 - Rolling bearings
 - Ball screws
 - Guiding systems
 - Belt transmission

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	MOTT, Robert L. Diseño de elementos de máquinas. Pearson Prentice Hall (2006)
Technical articles	DECKER, Karl-Heinz. Elementos de máquinas (Manual del Ingeniero Técnico, Volumen XIII) URMO
Class presentations	BUDYNAS, Richard. Diseño en ingeniería mecánica de Shigley. McGraw-Hill Interamericana de España S.L.; Edición: 8 (26 de febrero de 2008)
Video projections	NORTON, Robert L. Diseño de Máquinas. Norton, Robert L. (2010)
Student book	HARNOY Avraham. Bearing Design in Machinery. Engineering Tribology and Lubrication Marcel Dekker, Inc (2003)
Slides of the subject	

BRANDLEIN, J. Ball and Roller Bearings Theory, Design, and Application. John Wiley Sons, Ltd. (1999)

HARRIS, KOTZALAS. Advanced Concepts of bearing Technology. Taylor & Francis (2007)

HUNG NGUYEN-SCHÄFER. Computational Design of Rolling Bearings. Springer (2016)

ERWIN V. ZARETSKY. Rolling Bearing Life Prediction, Theory and Application. Glenn Research Center, Cleveland, Ohio (2013)

<https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20130011515.pdf>

HUGH SPIKES. Basic of EHL for practical application. Lubrication science 2015; 27:45-67

CHILDS, Peter RN. Mechanical Design Engineering Handbook (2nd edition). Butterworth-Heinemann (2014)

BUDYNAS, Richard G. et al. Shigley's Mechanical Engineering Design (9th edition). Mc Graw Hill (2011)