GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Bone Cement Modyfication, PG_00073365		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English -
Semester of study	2	ECTS credits	10.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Biomaterials Technology -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Beata Świeczko-Żurek	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	100.0	0.0	0.0	100

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 9026 Bone Cement Modification
https://enauczanie.pg.edu.pl/2025/course/view.php?id=9026

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	100	20.0	130.0	250

Subject objectives

The goal of the course is to gain the knowledge necessary for making and improving bone cements. It includes getting familiar with modern manufacturing techniques, the additives used in them, and the research related to them.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W04] has structured and well-founded knowledge covering issues in the field of mechanical engineering allowing to design medical devices, rehabilitation systems and to formulate research procedures	Is able to produce and understand the use of bone cements in clinical practice.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K7_U01] uses acquired analytical, simulation and experimental methods as well as mathematical models to solve engineering problems in the field of medical engineering	They can use specialized equipment to produce bone cement and characterize it.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K7_U15] evaluates the feasibility of advanced methods and tools for solving complex engineering tasks of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose	He has advanced knowledge about bone cements and their effects on tissues.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Course content – laboratory

The subject is about learning the technology of making bone cement, its additives, modifications, and its use in surgery and orthopedics. In this course, students will gain both theoretical knowledge and practical skills.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Final project</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Dorozhkin, S. V. Calcium Orthophosphates: Applications in Nature, Biology, and Medicine. Pan Stanford Publishing, 2012.
2. Bohner, M., & Lemaitre, J. Calcium Phosphates in Medicine Applications: From Ceramics to Cements. Springer, 2019.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Kutz, M. (Ed.). Standard Handbook of Biomedical Engineering and Design. McGraw-Hill, 2003.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1. Types of bone cements
2. Technology for making bone cements
3. Active substances placed in bone cements
4. Studies used for bone cements</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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