Topics and scope of doctoral dissertations
in the discipline of biomedical engineering
in the academic year 2025/2026

Lp.	Imię i nazwisko	Tematyka	Zakres rozprawy doktorskiej	Telefon służbowy	e-mail
1.	**dr hab. inż. Joanna Mystkowska, prof. PB**	Composite materials based on biodegradable polymers and bioceramics for regenerative engineering applications	1. Literature Review – overview of image segmentation methods in veterinary medicine and machine learning techniques used in diagnostics. 2. Evaluation of current software used in animal CT processing and identification of their limitations. 3. Design of a novel CT image segmentation method using AI, tailored to the needs of veterinary diagnostics. 4. Implementation of the method on real datasets and comparison with conventional techniques. 5. Evaluation of segmentation accuracy and its impact on the veterinary diagnostic process. 6. Verification of the method's usefulness in detecting degenerative changes in the temporomandibular joint. 7. Conclusions and Future Work.	571-443-083	j.mystkowska@pb.edu.pl
2.	**dr hab. inż. Marta Borowska**	Optimization of machine learning and data mining methods in mathematical analysis of animal tomographic images in veterinary medicine	1. Literature Review – overview of image segmentation methods in veterinary medicine and machine learning techniques used in diagnostics. 2. Evaluation of current software used in animal CT processing and identification of their limitations. 3. Design of a novel CT image segmentation method using AI, tailored to the needs of veterinary diagnostics. 4. Implementation of the method on real datasets and comparison with conventional techniques. 5. Evaluation of segmentation accuracy and its impact on the veterinary diagnostic process. 6. Verification of the method's usefulness in detecting degenerative changes in the temporomandibular joint. 7. Conclusions and Future Work.	571-443-079	m.borowska@pb.edu.pl

3.	**dr hab. Robert Przekop, prof. UAM**	Modified silicone composites with functional properties for additive technologies in biomedical engineering applications	1. Literature review of silicone materials used in biomedical engineering and additive technologies. 2. Characterization of silicone base materials and their modifications using organosilicon compounds and functional additives (e.g. fibers, particles). 3. Development of material compositions compatible with additive technologies, including optimization of rheological properties and process parameters. 4. Evaluation of mechanical, physicochemical, morphological and functional properties of the obtained materials. 5. Analysis and interpretation of research results. 6. Evaluation of potential applications of the developed materials in biomedical engineering. 7. Summary of research results and formulation of final conclusions.	tel. +48 61 8291883	rprzekop@amu.edu.pl