

1	Module Name	Project Work on Advanced Materials, Processes and Applications – “Biomaterials” Interdisciplinary tutorial at the joint EMRS- EUROMAT materials weekend 19./20.09.2015 in Warsaw, Poland	5 ECTS
2	Courses	A Bioactive materials and composites for tissue engineering and drug delivery (Prof. Aldo R. Boccaccini, University of Erlangen, D), 60 min B Biofabrication of scaffolds for tissue engineering (Prof. Wojciech Swieszkowski, Warsaw University of Technology, PL), 60 min C Natural-based polymers in biomedical applications (Prof. João F. Mano, University of Minho, PT), 60 min D Poster Session on “Biomaterials”, 60 min	3 ECTS
		E EMRS Fall meeting 2015 or EUROMAT 2015 conference	2 ECTS
3	Teaching Staff	A Prof. Aldo R. Boccaccini, Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen- Nuremberg, D, aldo.boccaccini@ww.uni-erlangen.de B Prof. Wojciech Swieszkowski Materials Department, Warsaw University of Technology, PL, wojciech.swieszkowski@inmat.pw.edu.pl C Prof. João F. Mano, Dept. of Polymer Engineering, University of Minho, PT, jmano@dep.uminho.pt D Prof. Aldo R. Boccaccini, Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen- Nuremberg, D, aldo.boccaccini@ww.uni-erlangen.de E Module Coordinators	
4	Module Coordinators	Prof. Aldo R. Boccaccini, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, D, aldo.boccaccini@ww.uni-erlangen.de Prof. A. Lindsay Greer, Department of Materials Science & Metallurgy, University of Cambridge, UK, alg13@cam.ac.uk Prof. Peter J. Wellmann, Materials Department, University of Erlangen-Nürnberg, D, peter.wellmann@fau.de	
4	Syllabus Outline	<ul style="list-style-type: none"> • Introduction to bioactive materials • Bioactive glasses and composites for tissue scaffolds • Case study 1 – Enhancing the mechanical properties of bioactive glass scaffolds for bone tissue engineering • Case study 2 – Biopolymer-inorganic phase 	

		<ul style="list-style-type: none"> composites for drug delivery scaffolds • Computer-added design of scaffolds to be biofabricated • Methods of biofabrication in tissue engineering • Case study 3 - Bioprinting of constructs for bone and cartilage regeneration • Case study 4 - Electrospinning of the nanofibrous scaffolds for nerve regeneration • Sources of biopolymers to be used in tissue engineering and drug delivery applications. • Dealing with complexity: selection of natural-based systems in biomedicine. • Case study 5 - Hydrogels. • Case study 6 - Nanostructured multilayers
6	Educational goals and Learning outcome	<ul style="list-style-type: none"> • Specific skills: Gain of broad and interdisciplinary knowledge in a modern topic of advanced materials, processes and applications • Soft skills: Ability to present own literature survey and to carry out a scientific discussion. • For all skills: Can explain, apply and reflect upon the theories, technologies, specialties, terminology, boundaries and different schools of their discipline (field of gained knowledge) critically and in depth.
7	Prerequisites	Bachelor degree in Chemistry, Molecular Science, Physics, Nanotechnology, Materials Science or a related course
8	Intended stage in the degree course	Elective module during Master or Graduate Studies (interdisciplinary studies, soft skill training)
9	Courses of study for which the module is acceptable	M.Sc. and PhD-studies in Chemistry, Molecular Science, Physics, Nanotechnology, Materials Science or a related course
10	Assessment and examinations	<ul style="list-style-type: none"> • Oral examination during poster session (15 min) • notes from attended conference (8 pages)
11	Calculation of the grade for the module	100% from oral examination (passed or failed)
12	Frequency of offer	Single event, September 19 th + 20 th , 2015 + associated conference week
13	Workload	<ul style="list-style-type: none"> • Home studies (preparation of poster presentation): 90h • Tutorial day (lectures + poster session): 4 h • Conference attendance (EMRS fall meeting or EUROMAT 2015 conference, September 2015 in Warsaw, Poland): 56 h
14	Duration	1 semester / term
15	Language	English
16	Preparatory reading / reading list	Selected publication list of the tutorial speakers

Module Catalogue (to be completed by home University / College):

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