Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Annex SFB

Studienfachbeschreibung (subject description, SFB) for the subject Functional Materials as a Bachelor's with 1 major

with the degree "Bachelor of Science" (180 ECTS credits)

Responsible: Faculty of Chemistry and Pharmacy
Responsible:

Examination regulations version: 2015
Examination regulations version: 2015

Abbreviations used:

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

Conventions for the modules in this SFB:

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Information on assessment procedures:

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should a module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with the general regulations governing the degree subject described in this module catalogue:

ASPO2015

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

12-Aug-2015 (2015-82)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

Every module will be described using the following form:

Abbreviation	**Module title**							
	ECTS		Duration	(in semesters)	Method of grading		Module level	
	Courses	To be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y						
	Method of assessment							
	Only after successful completion of	if applicable						
	Other prerequisites	if applicable						
	Participants and allocation of places	if applicable						
	Additional information	if applicable						
	Referred to in LPO I	if applicable (examination regulations for teaching-degree programmes)						

Compulsory Courses (128 ECTS credits)								
Mathematics								
10-M-FUN1-152-m01	**Mathematics 1 for Students of Functional Materials**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses	V (5) + Ü (2) Module taught in: Ü: German or English						
	Method of assessment	a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus						
10-M-FUN2-152-m01	**Mathematics 2 for Students of Functional Materials**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses	V (5) + Ü (2) Module taught in: Ü: German or English						
	Method of assessment	a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (groups of 2, approx. 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus						
11-M-D-152-m01	**Mathematics 3 for Students of Physics and related Disciplines (Differential Equations)**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses	V (4) + Ü (2) Module taught in: Ü: German or English						
	Method of assessment	written examination (approx. 120 minutes) Language of assessment: German and/or English						

Modules Mathematics/Statistics								
11-ENNF1-152-m01	**Classical Physics 1 for Students of Physics related Disciplines**							
	ECTS	7	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2) Module taught in: Ü: German or English					
	Method of assessment		written examination (approx. 120 minutes) Language of assessment: German and/or English					
	other prerequisites		Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.					
	Additional Information		Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.					
11-ENNF2-152-m01	**Classical Physics 2 for Students of Physics related Disciplines**							
	ECTS	7	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2) Module taught in: Ü: German or English					
	Method of assessment		written examination (approx. 120 minutes) Language of assessment: German and/or English					
	other prerequisites		Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.					
	Additional Information		Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.					
11-PNNF-152-m01	**Laboratory Course Physics for Students of Physics Related Disciplines**							
	ECTS	3	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (4)					
	Method of assessment		a) practical assignment with oral test (approx. 15 minutes, during experiments) and b) written examination (90 minutes). Each experiment comprises preparation, performance and evaluation. Test as well as performance of experiments can each be repeated once.					

11-TMS-152-m01	**Introduction to the Physics of Functional Materials**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + R (1) Module taught in: German or English					
	Method of assessment		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
Chemistry								
08-AC-Ex-Chem-152-m01	**Experimental Chemistry**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4)					
	Method of assessment		written examination (approx. 90 minutes) Language of assessment: German and/or English					
08-ACP1-FU-152-m01	**General and analytical Chemistry Lab for engineering students**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (5)					
	Method of assessment		Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
	Modules successfully completed		08-AC-ExChem					

08-OC1-152-m01	**Organic Chemistry 1**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
	Additional Information		according to § 2 para. 2 sentence 2 APOLmCh in conjunction with No. I 2nd letter b) of annex 1 to the APOLmCh and No. 2 of annex 2 to the APOLmCh					
	Referred to in LPO I		§ 62 I Nr. 2					
08-OC2-VL-152-m01	**Organic Chemistry 2**							
	ECTS	6	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
	Additional Information		according to § 2 para. 2 sentence 2 APOLmCh in conjunction with No. I 2nd letter b) of annex 1 to the APOLmCh and No. 2 of annex 2 to the APOLmCh					
	Referred to in LPO I		§ 42 I Nr. 2 and § 22 II Nr. 1 h) § 62 I Nr. 2					
08-OCP1-FU-152-m01	**Organic Chemistry for engineering students (practical course)**							
	ECTS	2	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (4)					
	Method of assessment		Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, winter semester					
	Modules successfully completed		08-OC1					

08-PC-TKE-152-m01	**Thermodynamics, Kinetics, Electrochemistry**							
	ECTS	9	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English creditable for bonus					
	Referred to in LPO I		§ 62 I Nr. 1					
08-PC-QMS-FU-152-m01	**Principles of quantum mechanics and spectroscopy for engineering students**							
	ECTS	8	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English creditable for bonus					
08-PCP-FU-152-m01	**Physical Chemistry (lab) for engineering students**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (4)					
	Method of assessment		Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
	Modules successfully completed		08-PC-QMS-FU or 08-PC-TKE					
08-FU-Mo-MaV-152-m01	**Molecular Materials (Lecture)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + S (1)					
	Method of assessment		[a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)] as well as talk (approx. 30 minutes), weighted 3:1 Language of assessment: German and/or English					

08-FU-Mo-MaP-152-m01	**Molecular Materials (Practical Course)**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (5)					
	Method of assessment		Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations) Language of assessment: German and/or English					
	Modules successfully completed		08-FU-MoMa-V					
Engineering								
99-EL1-152-m01	**Basics of Electronics 1**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
99-EL2-152-m01	**Basics of Electronics 2**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
Biology / Medicine								
03-FU-Zell-152-m01	**Principles of Cell Biology and Tissue Regeneration**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					

03-FU-BM-152-m01	**Biomaterials (Lecture and Practical Course / Seminar)**							
	ECTS	7	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + P (2)					
	Method of assessment		a) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, summer semester creditable for bonus					
Advanced Laboratory Course								
08-FU-VP-152-m01	**Advanced Laboratory Course of Functional Materials**							
	ECTS	3	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (3)					
	Method of assessment		talk (approx. 15 minutes) Language of assessment: German and/or English					
Compulsory Electives (20 ECTS credits)								
Engineering								
99-TM-152-m01	**Basics of Applied Mechanics**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English Assessment offered: Once a year, winter semester					
99-IP-152-m01	**Laboratory Course of Mechanical and Electrical Engineering**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (5)					
	Method of assessment		placement report (15 to 30 pages) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
	Modules successfully completed		99-EL1 and 99-EL2					
	other prerequisites		Students are highly recommended to complete module 99-TM prior to completing module 99-IP as well as to complete modules 99-CA and 99-IP simultaneously.					

99-CA-152-m01	**Construction, Calculation and Assembly of Technical Products**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English Assessment offered: Once a year, summer semester creditable for bonus					
Physics								
11-N-EIN-152-m01	**Introduction to Nanoscience**							
	ECTS	7	Duration	2 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + S (2) Module taught in: German or English					
	Method of assessment		a) talk (30 to 45 minutes) with discussion and b) written examination (approx. 120 minutes) Language of assessment: German and/or English					
	other prerequisites		Admission prerequisite to assessment: regular attendance (minimum 85% of sessions).					
	Additional Information		Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.					
11-PPT-152-m01	**Laboratory Course Physical Technology of Material Synthesis**							
	ECTS	8	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (5) Module taught in: German or English					
	Method of assessment		Preparation of the experiment will be considered successfully completed if a pre-experiment oral test (approx. 15 minutes) is passed. Performing and evaluating the experiments will be considered successfully completed if a if a Testat (exam) is passed. An experiment log (approx. 8 pages) must be prepared. Each component of the assessment can be repeated once in the respective semester. Only if both components of the assessment have been successfully completed in the same semester will the module component be considered successfully completed. Language of assessment: German and/or English Assessment offered: Once a year, winter semester					
	other prerequisites		Students of Funktionswerkstoffe (Functional Materials, Bachelor's) are recommended to take module 11-P-FR1.					

11-P-FR1-152-m01	**Data and Error Analysis**							
	ECTS	2	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		V (1) + Ü (1) Module taught in: Ü: German or English					
	Method of assessment		written examination (approx. 120 minutes) Language of assessment: German and/or English					
	other prerequisites		Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.					
	Additional Information		Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.					
	Referred to in LPO I		§ 53 I Nr. 1 c) § 77 I Nr. 1 d)					
Mathematics and Computer Science								
10-M-COM-152-m01	**Computational Mathematics**							
	ECTS	4	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		V (1) + Ü (2)					
	Method of assessment		project in the form of programming exercises (approx. 20 to 25 hours) Language of assessment: German and/or English Assessment offered: Once a year, winter semester					
	Referred to in LPO I		§ 22 II Nr. 3 f)					
10-M-DGLaf-152-m01	**Ordinary Differential Equations for students of other subjects**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus					

10-M-FA-Naf-152-m01	**Introduction to Functional Analysis for Students of other Subjects**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus					
10-M-NUM1af-152-m01	**Numerical Mathematics 1 for students of other subjects**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus					
10-M-NUM2af-152-m01	**Numerical Mathematics 2 for students of other subjects**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus					
10-M-PRG-152-m01	**Programming course for students of Mathematics and other subjects**							
	ECTS	3	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (2)					
	Method of assessment		project in the form of programming exercises (approx. 20 to 25 hours) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
	Referred to in LPO I		§ 22 II Nr. 3 f)					

10-I-DB-152-m01	**Databases**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + Ü (2)					
	Method of assessment		written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus					
	Referred to in LPO I		§ 49 I Nr. 1 b) § 69 I Nr. 1 b)					
10-I-EIN-152-m01	**Introduction to Computer Science for Students of all Faculties**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4) + Ü (2)					
	Method of assessment		written examination (approx. 60 to 120 minutes) Language of assessment: German and/or English					
Chemistry								
08-PKC-152-m01	**Programming and numerical methods**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		S (2) + Ü (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					
08-BC1-152-m01	**Biochemistry 1**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + Ü (1)					
	Method of assessment		written examination (approx. 60 to 90 minutes)					
	Additional Information		according to § 2 para. 2 sentence 2 APOLmCh in conjunction with No. II 2nd letter e) and No. II 1st letter c) of annex 1 to the APOLmCh and No. 3 of annex 3 to the APOLmCh					
	Referred to in LPO I		§ 42 I Nr. 2 § 62 I Nr. 2					

08-TC-152-m01	**Quantum Chemistry**							
	ECTS	3	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English creditable for bonus					
	Referred to in LPO I		§ 22 II Nr. 1 h) § 22 II Nr. 2 f) § 22 II Nr. 3 f)					
08-PS3-152-m01	**Applied Spectroscopy 3**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
08-OC-Spec-152-m01	**Practical spectroscopy 1**							
	ECTS	3	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
	Referred to in LPO I		§ 22 II Nr. 1 h) § 22 II Nr. 2 f) § 62 I Nr. 2					

08-FU-NT-152-m01	**Chemically and bio-inspired Nanotechnology for Material Synthesis**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
Medicine								
03-FU-TV-152-m01	**Physical Technology of Material Synthesis (Lecture and Practical Course)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + P (2)					
	Method of assessment		a) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, summer semester creditable for bonus					
03-FU-PM1-152-m01	**Polymer Chemistry 1 (Lecture and Practical Course)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + P (2)					
	Method of assessment		a) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) Language of assessment: German and/or English Assessment offered: Once a year, winter semester creditable for bonus					
03-FU-TE-152-m01	**Principles of Tissue Engineering**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (4)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English Assessment offered: Once a year, summer semester					

Additional Qualifications								
08-FU-IP1-152-m01	**Industrial Internship (Short)**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (4)					
	Method of assessment		report (5 to 10 pages) Language of assessment: German and/or English					
	other prerequisites		Please consult with course advisory service in advance.					
08-FU-AP1-152-m01	**Foreign Studies (Short)**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		P (4)					
	Method of assessment		report (approx. 2 pages); proof of having completed lab course Language of assessment: German and/or English or potentially language of the respective country					
	other prerequisites		Please consult with course advisory service in advance.					
08-FU-WP1-152-m01	**Courses Related to Functional Materials outside of the Natural Sciences**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		Ü (0)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
	other prerequisites		Please consult with course advisory service in advance.					
08-FU-WP2-152-m01	**Courses Related to Functional Materials inside of the Natural Sciences**							
	ECTS	5	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate
	Courses		Ü (0)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
	other prerequisites		Please consult with course advisory service in advance.					

Key Skills Area (20 ECTS credits)								
General Key Skills (5 ECTS credits) Students may select modules offered as part of the pool of general transferable skills (ASQ) of JMU.								
Subject-specific Key Skills (15 ECTS credits)								
08-FU-Ma-Wi1-152-m01	**Material Science 1 (Basic introduction)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
08-FU-Ma-Wi2-152-m01	**Material Science 2 (The Material Groups)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (3) + Ü (1)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English					
08-FU-MAM-152-m01	**Modern Bio Analytical Methods (Lecture and practical course)**							
	ECTS	5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		V (2) + P (2)					
	Method of assessment		a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes) Language of assessment: German and/or English Assessment offered: Once a year, summer semester creditable for bonus					

Thesis (12 ECTS credits)								
08-FU-BT1-152-m01	**Bachelor Thesis Functional Materials Research**							
	ECTS	10	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		No courses assigned to module					
	Method of assessment		Bachelor's thesis (20 to 40 pages) Language of assessment: German and/or English					
	Additional Information		Time to complete: 10 weeks.					
08-FU-BT2-152-m01	**Bachelor Thesis Functional Materials Defense**							
	ECTS	2	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate
	Courses		K (1)					
	Method of assessment		talk (approx. 20 minutes) with discussion (approx. 20 minutes) Language of assessment: German and/or English					