

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: $\mathbf{E} = \text{field trip}$, $\mathbf{K} = \text{colloquium}$, $\mathbf{O} = \text{conversatorium}$, $\mathbf{P} = \text{placement/lab course}$, $\mathbf{R} = \text{project}$, $\mathbf{S} = \text{seminar}$, $\mathbf{T} = \text{tutorial}$, $\mathbf{U} = \text{exercise}$, $\mathbf{V} = \mathbf{V} = \mathbf$

= 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

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not cre-

modules in this SFB: ditable for bonus.

Information on Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the meassessment procedures: thod 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:

ASP02015

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 sp	be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y							
	Method of as	sessm	ent								
	Only after su completion o		ıl if applic	f applicable							
	Other prereq	uisites	if applic	able							
	Participants on of places		ocati- if applic	able							
	Additional in	formati	ion if applic	able							
	Referred to in	า LPO I	if applic	if applicable (examination regulations for teaching-degree programmes)							

Compulsory Cours	es (128 ECTS credits)											
Mathematics												
10-M-FUN1-152-	Mathematics 1 for Stu	dents of Functional Materials										
mo1	ECTS 10 Durati	on 1 semester Method of grading numerical grade Modul level undergraduate										
	Courses	V (5) + Ü (2) Module taught in: Ü: German or English										
	Method of assessmen	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-	Mathematics 2 for Students of Functional Materials											
mo1	ECTS 8 Durati	on 1 semester Method of grading numerical grade Modul level undergraduate										
	Courses	V (5) + Ü (2) Module taught in: Ü: German or English										
	Method of assessmen	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 Stu	dents of Physics and related Disciplines (Differential Equations)										
	ECTS 8 Durati	on 1 semester Method of grading numerical grade Modul level undergraduate										
	Courses	$V(4) + \ddot{U}(2)$ Module taught in: \ddot{U} : German or English										
	Method of assessmen	written examination (approx. 120 minutes) Language of assessment: German and/or English										

Modules Mathemat	tics/Statis	tics										
11-ENNF1-152-m01	Classical	Physics	1 for St	tudents	of Physics rela	ted Disciplines						
	ECTS 7	Di	uration	1 1	ı semester	Method of	grading	numerical gr	ade	Modul level	undergraduate	
	Courses			V (4) + Ü (2) Module taught in: Ü: German or English								
	Method o	f assess		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.								
	Additiona	ıl Informa		considered the quastudent for an a sessme	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 S	tudents of Physics related Disciplines								
	ECTS 7	Di	uration	1 1	ı semester	Method of	grading	numerical gr	ade	Modul level	undergraduate	
	Courses			V (4) + Module	• •	erman or Englis	h					
	Method of assessment					pprox. 120 minunt: German and		sh				
	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	Laborator	ry Course	e Physi	ics for S	tudents of Phys	sics Related Dis	ciplines					
	ECTS 3	Di	uration	1 1	semester	Method of	grading	(not) succes	sfully 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.								
Bachelor's with 1 major F	unctional Mate	rials (2015)						JMU Würzbı	rg • generated 18-Apr-2	025 • exam. reg. data r	record 82 g81 - - H 2015 page 4 / 18	

11-TMS-152-m01	Introdu	ction to	the Phys	sics of	Functional Materia	ls			_			
	ECTS	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	S			V (3) + R (1) Module taught in: German or English							
	Method	l of asso	essment	b) ora c) ora d) pro e) pre If a wr form o the le- Langu	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			-									
o8-AC-Ex-	Experimental Chemistry											
Chem-152-m01	ECTS	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	S		V (4)								
	Method	d of asso	essment		n examination (applage of assessment	orox. 90 minutes) t: German and/or Engl	lish					
08-ACP1-FU-152-	Genera	l and ar	nalytical (Chemis	try Lab for enginee	ering students						
mo1	ECTS	5	Duratio	n	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	S		P (5)								
	Method	of ass	essment	and a	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			o8-AC-ExChem								

08-0C1-152-m01	Organi	c Chem	istry 1							
	ECTS	5	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Course	S		V (3)	+ Ü (1)					
	Method	d of ass	sessment	b) ora c) ora d) log e) pre	al examination of or al examination in gro g (approx. 20 pages) esentation (approx.	or	to 30 minutes) or dates (approx. 15 minutes per	candidate) or		
				anne	x 2 to the APOLmCh		in conjunction with No. I 2nd l	etter b) of annex	1 to the APOLmCh and No. 2 of	
	Referre			§ 62 l	Nr. 2			,		
08-0C2-VL-152-	Organi					,				
mo1		6	Duratio	,	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Course	_			+ Ü (1)					
	Method of assessment			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						
	Referre			§ 62 l						
08-0CP1-FU-152-		c Chem	istry for e	ngine	ering students (prac					
mo1	ECTS	2	Duratio		1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate	
	Course			P (4)	_					
	Method of assessment			and a Langu	Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages ea 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			08-0	C1					

08-PC-TKE-152-	Thermo	odynam	nics, Kinet	ics, El	ectrochemistry								
mo1	ECTS	9	Duration	n	1 semester	Method of grad	ling numerical grade	Modul level	undergraduate				
	Courses	S		V (4)	+ Ü (2)			,					
	Method	d of ass	essment		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)								
					uage of assessme table for bonus	ent: German and/or	English						
	Referre	d to in	I DO I	§ 62									
o8-PC-QMS-						copy for engineerin							
FU-152-m01		8	Duration				ling numerical grade	Modul level	undorgraduato				
10 1/201		<u> </u>	Duration		1 semester	Method of grad	ing numerical grade	Modul level	undergraduate				
	Courses	_			+ Ü (2)	(, , ,	• • •						
	Method	or ass	sessment			(approx. 90 to 180							
				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-	Physical Chemistry (lab) for engineering students												
mo1	_	5	Duration		1 semester		ling (not) successfully complet	ted Modul level	undergraduate				
	Courses			P (4)			, ,						
	Method	of ass	essment	Vorte	Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each)								
							(2 to 4 random examinations)	-	- ', - ', -				
						ent: German and/or							
	Madula		essfully		Assessment offered: Once a year, summer semester								
	comple		essiully	08-P0	o8-PC-QMS-FU or o8-PC-TKE								
o8-FU-Mo-	Molecu	ılar Maf	terials (Le	cture)									
MaV-152-mo1	ECTS	5	Duration		1 semester	Method of grad	ling numerical grade	Modul level	undergraduate				
	Courses	S		V (3)	+ S (1)								
	Method	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									
				Langi	<u> </u>	int. German and/or							

o8-FU-Mo-	Mole	Molecular Materials (Practical Course)													
MaP-152-m01	ECTS	5	Duration		1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate						
	Cours	ses	·	P (5)				•							
	Meth	od of ass	sessment					15 minutes eac	h, log approx. 5 to 10 pages each)						
							4 random examinations)								
	Modu	ıles succ	occfully		-MoMa-V	German and/or Engli	1511								
	comp		essiully	06-70	-IVIOIVId-V										
Engineering															
99-EL1-152-m01	Basic	s of Elec	tronics 1												
	ECTS 5 Duration				1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Cours				(3) + Ü (1)										
	Meth	od of ass	sessment	a) wri	tten examination (ap	oprox. 90 to 180 minu	ites) or								
						e candidate each (20		randidate) or							
				c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or											
				e) pre	sentation (approx. 3	o minutes)									
				Langu	age of assessment:	German and/or Engli	ish								
99-EL2-152-m01			tronics 2			I		T							
	ECTS 5 Duratio				1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Cours				V (3) + Ü (1)										
	Meth	od of ass	sessment	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or											
				c) oral examination of one candidate each (20 to 30 minutes) or											
				d) log	(approx. 20 pages)	or	2.000 (albhana 23								
					sentation (approx. 3										
				Langu	age of assessment:	German and/or Engli	ISh								
Biology / Medicine															
03-FU-Zell-152-				<u> </u>	Tissue Regeneration										
mo1	ECTS		Duration		1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Cours			V (4)											
	Meth	od of ass	sessment	a) wri	tten examination (ap	oprox. 90 to 180 minu	ites) 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)											
				Langu	age of assessment:	German and/or Engli	ish		Language of assessment: German and/or English						

03-FU-BM-152-m01	Biomat	erials (I	Lecture a	nd Prac	ctical Course / Semi	inar)					
_	ECTS	7	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Course	S		V (4) ·	+ P (2)			•			
	Method	d of asso	essment	prox. Langu Asses	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 Laborato	ry Cours	se									
08-FU-VP-152-m01	Advanc	ed Labo	oratory Co	ourse o	f Functional Materi	als					
	ECTS	3	Duration	n	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate		
	Course	S		P (3)							
	Method	ethod of assessment talk (approx. 15 minutes) Language of assessment: German and/or English									
Compulsory Electiv	es (20 E	CTS cre	dits)								
Engineering											
99-TM-152-m01	Basics of Applied Mechanics										
	ECTS	5	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Course	S	-	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	Labora	tory Co	urse of M	echani	cal and Electrical Er	ngineering		,			
	ECTS	5	Duration	n	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate		
	Course	S		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	Constru	uction,	Calculatio	n and	Assembly of Tech	nical Products							
	ECTS	5	Duration	1	1 semester	Method of gradin	g numerical grade	Modul level	undergraduate				
	Course	S		V (2)	$V(2) + \ddot{U}(2)$								
	Method	of ass	essment	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)								
				Langu	uage of assessmer	nt: German and/or En							
					ssment offered: On table for bonus	ice a year, summer s	emester						
Physics				credit	lable for bollus								
· ·	Introdu	ation t	o Nanosci										
11-N-EIN-152-m01		7	Duration		2 semester	Method of gradin	g numerical grade	Modul level	undergraduate				
	Course	<u> </u>		,	+ S (2)	Method of gladin	g Humericat grade	Modulitevel	undergraduate				
	Course	J			Module taught in: German or English								
	Method of assessment			a) tall Langu	k (30 to 45 minutes	s) with discussion an at: German and/or En	d b) written examination (approglish	x. 120 minutes)					
	other prerequisites			_			lar attendance (minimum 85% o	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		tory Co	urse Phys	ical Te	chnology of Mate								
	ECTS	8	Duration		1 semester	Method of gradin	g (not) successfully completed	Modul level	undergraduate				
	Course			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 p	rerequi	sites	Stude	ents of Funktionsw	erkstoffe (Functional	Materials, Bachelor's) are recor	nmended to take	e module 11-P-FR1.				

11-P-FR1-152-m01	Data and Error Analysis												
	ECTS	2	Duration		1 semester	Method of grading (ne	ot) successfully completed	Modul level	undergraduate				
	Course	S	·		V (1) + Ü (1) Module taught in: Ü: German or English								
	Method	d of ass	essment		vritten examination (approx. 120 minutes) anguage of assessment: German and/or English								
	other p	rerequi		succe abou	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.								
	Additio	nal Info	ormation	consi neral the q stude for ar sessr	dered a declaration academic and exa ualification for adness that meet the reassessment or wh	n of will to seek admission mination regulations). If t nission to assessment, th respective prerequisites c nose registration for an as	n to assessment pursuant to he module coordinators sub ey will put the student's regi an successfully register for a sessment was not put into e	o Section 20 Subsequently find istration for ass an assessment.	on to assessment, this will be bsection 3 Sentence 4 ASPO (gethat the student has obtained sessment into effect. Only those Students who did not register admitted to the respective asde achieved in this assessment				
	Referre	d to in	LPO I		§ 53 Nr. 1 c) § 77 Nr. 1 d)								
Mathematics and	Compute	r Scien	ce										
10-M-COM-152-	Compu	tationa	l Mathem	atics									
mo1	ECTS	4	Duration	n	1 semester	Method of grading (n	ot) successfully completed	Modul level	undergraduate				
	Course	S		V (1) -	+ Ü (2)			-					
	Method	d of ass	essment	Langu	lage of assessmen	ogramming exercises (app t: German and/or English ce a year, winter semeste	<u>-</u>						
	Referre	d to in	LPO I	§ 22 l	I Nr. 3 f)								
10-M-DGLaf-152-	Ordina	ry Diffe	rential Eq	uation	s for students of o	ther subjects							
mo1	ECTS	10	Duration	n	1 semester	Method of grading nu	merical grade	Modul level	undergraduate				
	Course	S		V (4)	+ Ü (2)								
	Method of assessmen			b) ora c) ora Langu	al examination of o I examination in gr	approx. 90 to 180 minute ne candidate each (15 to 1 oups (groups of 2, 10 to 1 t: German and/or English	go minutes) or 5 minutes per candidate)						

10-M-FA-	Introdu	uction to	Function	al Ana	lysis for Students of	f other Subjects						
Naf-152-mo1	ECTS	10	Duration	1	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	:S		V (4) -	$V(4) + \ddot{U}(2)$							
	Method	d of asso	essment	b) ora c) ora Langu	n) written examination (approx. 90 to 180 minutes, usually chosen) or n) oral examination of one candidate each (15 to 30 minutes) or n) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) nanguage of assessment: German and/or English reditable for bonus							
10-M-NUM1af-152-	Numer	ical Mat	hematics	1 for s	tudents of other sub	ojects	"					
mo1	ECTS	10	Duration	1	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	:S		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-	Numer	ical Mat	hematics	ematics 2 for students of other subjects								
mo1	ECTS	10	Duration	1 semester Method of grading numerical grade		Modul level	undergraduate					
	Course	S		V (4) + Ü (2)								
	Method	d of asse	essment	b) ora c) ora Langu	l examination of one l examination in gro	oprox. 90 to 180 minutes, usually chosen) or e candidate each (15 to 30 minutes) or ups (groups of 2, 10 to 15 minutes per candidate) German and/or English						
10-M-PRG-152-m01	Progra	mming	course fo	rstude	nts of Mathematics	and other subjects	,					
	ECTS	3	Duration	1	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate				
	Course	:S		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 l	l Nr. 3 f)							

10-l-DB-152-m01	Databa	ses				_	·					
	ECTS	5	Duratio	1	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	S	•	V (2) ·	+ Ü (2)	·	•	•				
	Method	d of ass	essment	If ann of one date). Langu	ounced by the lect e candidate each (a	prox. 60 to 120 minutes). urer at the beginning of the course, the writt approx. 20 minutes) or an oral examination i t: German and/or English						
	Referred to in LPO I				§ 49 Nr. 1 b) § 69 Nr. 1 b)							
10-I-EIN-152-m01	Introdu	ction t	o Comput	er Scie	nce for Students o	f all Faculties						
	ECTS	10	Duratio	1	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	S		V (4) ·	+ Ü (2)							
	Method	d of ass	essment		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	Duratio		1 semester	Method of grading (not) successfully cor	mpleted Modul level	undergraduate				
	Course			` ′	+ 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	Bioche	mistry	1									
		5	Duratio		1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course			` ′	+ Ü (1)			_				
						prox. 60 to 90 minutes)						
	Additio	nal Info	ormation	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								
	Referre	d to in	LPO I	§ 42 l § 62 l								

08-TC-152-m01	Quantum Chemistry												
	ECTS 3 Duration		n 1 semester		Method of grading numerical grade	e Modul lev	el undergraduate						
	Courses			V (2)	V (2) + Ü (1)								
	Method	d of ass	essment	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 Nr. 1 h) § 22 Nr. 2 f) § 22 Nr. 3 f)									
08-PS3-152-m01	Applied	Spect	roscopy 3	•									
	ECTS	5	Duratio	n	1 semester	Method of grading numerical grade	e Modul lev	el undergraduate					
	Course	S		V (3)	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									
08-0C-Spec-152-	Practical spectroscopy 1												
mo1	ECTS 3 Duratio		n	1 semester	Method of grading numerical grade	e Modul lev	el undergraduate						
	Courses			V (2)									
	Method	d of ass	essment	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									
	Referre	d to in	LPO I	§ 22 Nr. 1 h) § 22 Nr. 2 f) § 62 Nr. 2									

08-FU-NT-152-m01	Chemically and bio-inspired Nanotechnology for Material Synthesis												
l	ECTS 5 Duratio		1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Courses	V (4)	•	•	•							
	Method of ass		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)										
		La	nguage of assessment:	German and/or Eng	lish								
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 ass	pro La As	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-	Polymer Chemistry 1 (Lecture and Practical Course)												
mo1	ECTS 5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Courses		2) + P (2)										
	Method of ass	pro La As	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 T	issue Engine											
	ECTS 5	Duration	1 semester	Method of grading	numerical grade	Modul level	undergraduate						
	Courses		V (4)										
	Method of ass	b) c) d) e) La	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 Qualific	ations									
08-FU-IP1-152-m01	Industrial In	ternship (S	hort)							
	ECTS 5	ECTS 5 Duration		1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate		
	Courses		P (4)	P (4)						
	Method of as	ssessment	report (5 to 10 pages) Language of assessment: German and/or English							
	other prereq	uisites	Pleas	Please consult with course advisory service in advance.						
08-FU-AP1-152-	Foreign Studies (Short)									
mo1	ECTS 5	Duratio	n	1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate		
	Courses		P (4)		•		•			
	Method of as	ssessment	repor Langu	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 prereq	uisites	Please consult with course advisory service in advance.							
08-FU-WP1-152-	Courses Rela	ated to Fund	tional	Materials outside	of the Natural Scienc	es	,			
mo1	ECTS 5	Duratio	n	1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate		
	Courses		Ü (o)							
	Method of as	ssessment	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 prereq		Please consult with course advisory service in advance.							
08-FU-WP2-152-	Courses Rela	ated to Fund	tional	Materials inside o	f the Natural Science	5				
mo1	ECTS 5	Duratio	n	1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate		
	Courses		Ü (0)							
	Method of as	ssessment	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 prereq	uisites	Please consult with course advisory service in advance.							

Key Skills Area (20													
General Key Skills Students may selec				t of the	e pool of general tran	nsferable skills (ASQ)	of JMU.						
Subject-specific Ke	y Skills	(15 ECT	S credits))									
o8-FU-Ma-	Materi	Material Science 1 (Basic introduction)											
Wi1-152-m01	ECTS 5 Duratio			n 1 semester		Method of grading	numerical grade	Modul level	undergraduate				
	Course	!S		V (3) -	+ Ü (1)								
	Metho	d of ass	essment	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									
o8-FU-Ma-	Materi	al Scien	ce 2 (The	Mater	Material Groups)								
Wi2-152-m01	ECTS	5	Duratio		1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Course			$V(3) + \ddot{U}(1)$									
	Metho	d of ass	essment	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-	Moder	Modern Bio Analytical Methods (Lecture and practical course)											
mo1	ECTS	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Courses			V (2) + P (2)									
	Metho	d of ass	essment	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-	Bachelor Thesis Functional Materials Research									
mo1	ECTS	10	Duratio	1	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						
	Additio	nal Info	rmation	Time to complete: 10 weeks.						
08-FU-BT2-152-	Bachelor Thesis Functional Materials Defense									
mo1	ECTS	2	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Course	S	-	K (1)						
	Method	d of asse	essment	talk (approx. 20 minutes) with discussion (approx. 20 minutes) Language of assessment: German and/or English						