

Module Catalogue

for the Subject

Physics

as Unterrichtsfach

with the degree "Erste Staatsprüfung für das Lehramt an Grundschulen"

> Examination regulations version: 2009 Responsible: Faculty of Physics and Astronomy

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record L1|128|-|-|H|2009



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The subject is divided into

section / sub-section	ECTS credits	starting page
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Abbreviations used

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

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

Notes

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 the 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:

LASPO2009

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

20-Feb-2013 (2012-78)

25-Sep-2014 (2014-59)

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.

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Scientific Discipline

(54 ECTS credits)

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Compulsory Courses

(54 ECTS credits)

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Module title		Abbreviation			
Lab Course A 11-P-PA-112-m01			11-P-PA-112-m01		
Module coordinator			Module offered by		
Manag	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	Its		·		
Physica pagatic tests, v	al laws on, grap vriting o	of mechanics, thermody ohs, linear regression, av of lab reports and publica	namics, science of eld erage values and sta ations	ectricity, types of err ndard deviation, dis	or, error approximation and pro- tribution functions, significance
Intend	ed lear	ning outcomes			
The stu le to in measu princip	Idents depend ring pro les of s	know and have mastered dently plan and conduct e otocol. They are able to e statistics and to draw, pre	physical measuring experiments, to coop valuate the measurin esent and discuss the	methods and experi erate with others, an g results on the basi conclusions.	menting techniques. They are about to document the results in a dis of error propagation and of the
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
Auswer Ü (1 we Beispie BAM):	rtung vo ekly co ele aus P (2 we	on Messungen und Fehle Intact hour), once a year Mechanik, Wärmelehre L ekly contact hours)	rrechnung (Measurer (winter semester) ınd Elektrik (Example	nents and Data Anal s from Mechanics, T	ysis): V (1 weekly contact hour) + hermodynamics and Electricity,
Metho	d of ass	sessment (type, scope, langua	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
module is	s creditab	le for bonus)			
1. Topic 2. Lab ted i latec	 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 120 minutes) 2. Lab course: a) Preparing, performing and evaluating the experiments will be considered successfully completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). 				
Succes	sful co	mpletion of approx. 50%	of practice work is a	prerequisite for adm	ission to assessment componen
To pass assessment component 2, students must pass both elements a) and b). Students will be offered one op- portunity to retake element a) and/or element b). Students must register for assessment components 1 and 2 online (details to be announced). Students must attend Auswertung von Messungen und Fehlerrechnung (Measurements and Data Analysis) befo- re attending Beispiele aus Mechanik, Wärmelehre und Elektrik (Examples from Mechanics, Thermodynamics and Electricity).					
Allocat	ion of j	olaces			· · ·
	-				
Additio	onal inf	ormation	-		
Worklo	ad				
Teachi	ng cvcl	e			
	0.95				
L					
LA Grundso	chulen Phy	vsics (2009)	JMU Würzburg ● ge	nerated 26-Aug-2024 • exan	n. reg. data re- page 7 / 36

Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 53 (1) 1. c) Physik physikalische Grundpraktika
§ 77 (1) 1. a) Physik "Grundlagen der Experimentalphysik"
§ 77 (1) 1. d) Physik "physikalische Praktika"
Module appears in
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)

Bachelor' degree (1 major) Physics (2012)

Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Mathematical Physics (2012)

Bachelor' degree (1 major) Computational Mathematics (2012)

Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)

First state examination for the teaching degree Grundschule Physics (2003)

First state examination for the teaching degree Hauptschule Physics (2009)

First state examination for the teaching degree Realschule Physics (2009)

First state examination for the teaching degree Gymnasium Physics (2009)

First state examination for the teaching degree Mittelschule Physics (2013)

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Experimenta Oscillations Module coo Managing D ECTS Met 22 num Duration 2 semester Contents	Il Physics 1 and 2 - Teachir , Waves, Electrics, Magnet rdinator rector of the Institute of Ap	ng Post (Mechanics, T ism and Optics)	hermodynamics,	11-P-E-002-m01		
Oscillations Module coo Managing D ECTS Met 22 num Duration 2 semester Contents Physical law	, Waves, Electrics, Magnet dinator rector of the Institute of Ap	ism and Optics)				
Module coo Managing D ECTS Met 22 num Duration 2 semester Contents Physical law	r <mark>dinator</mark> rector of the Institute of Ap		Oscillations, Waves, Electrics, Magnetism and Optics)			
Managing D ECTS Met 22 num Duration 2 semester Contents Physical Jaw	rector of the Institute of Ap		Module offered by			
ECTS Met 22 num Duration 2 semester Contents Physical law		oplied Physics	Faculty of Physics a	nd Astronomy		
22 nun Duration 2 semester Contents Physical law	hod of grading	Only after succ. com	pl. of module(s)			
Duration 2 semester Contents Physical law	erical grade					
2 semester Contents Physical law	Module level	Other prerequisites				
Contents Physical law	undergraduate	Bridge course Mathe sound reading, writin	matik (Mathematics	 b) for first-semester students an as well as logical thinking skills 		
Physical law						
ves, science	s and elementary mathema of electricity, magnetism,	atical calculation methelectromagnetic vibra	hods of mechanics, tion and waves, rad	thermodynamics, vibration, wa iation and wave optics.		
Intended lea	rning outcomes					
The student mics, vibrat wave optics	s understand the basic prir ons, waves, science of elec	nciples, connections a ctricity, magnetism, el	nd calculation meth lectromagnetic vibra	nods of mechanics, thermodyna itions and waves, radiation and		
Courses (type	, number of weekly contact hours, l	anguage — if other than Germ	nan)			
Experimente year (winter Experimente a year (sum Mathematis hour), once Mathematis	Ile Physik 1 (Experimental semester) Ile Physik 2 (Experimental ner semester) che Rechenmethoden 1 (M a year (winter semester) che Rechenmethoden 2 (M	Physics 1): V (4 weekly Physics 2): V (4 weekl athematical Methods athematical Methods	y contact hours) + Ü ly contact hours) + Ü 1): V (2 weekly conta 2): V (2 weekly cont	(2 weekly contact hours), once Ü (2 weekly contact hours), once act hours) + Ü (1 weekly contact act hours) + Ü (1 weekly contact		
hour), once	a year (summer semester)					
Method of a	ssessment (type, scope, langua	ge — if other than German, e>	xamination offered — if no	t every semester, information on whether		
This module	bas the following accoss	ant components				
 Topics corexamination nutes) or Topics corexamination nutes) or Topics corexamination nutes) or Topics corexamination nutes, nutes, nutes 	vered in lectures and exerc on (approx. 120 minutes, L oral examination in groups vered in lectures and exerc on (approx. 120 minutes, L oral examination in groups vered in lectures and exerc ses or talk (approx. 15 min vered in lectures and exerc ses or talk (approx. 15 min vered in lectures and exerc usually chosen) or written of	ises in part 1 (Experim isually chosen) or oral (approx. 30 minutes, ises in part 2 (Experim isually chosen) or oral (approx. 30 minutes, ises in part 2 (Mathem utes, usually chosen) ises in part 2 (Mathem utes, usually chosen) ises in parts 1 and 2: of examination (approx. 2)	nentelle Physik 1 (Ex l examination of one groups of 2 candida nentelle Physik 2 (Ex l examination of one groups of 2 candida natische Rechenmet or written examinati natische Rechenmet or written examinati or a written examinati or a examination of 120 minutes).	perimental Physics 1)): written e candidate each (approx. 20 m ates). eperimental Physics 2)): written e candidate each (approx. 20 m ates). choden 1 (Mathematical Method ion (approx. 60 minutes) choden 2 (Mathematical Method ion (approx. 60 minutes) one candidate each (approx. 30		
Successful completion of approx. 50% of practice work each is a prerequisite for admission to assessment components 1 through 4. To qualify for admission to assessment component 5, students must pass assessment component 1 and/or 2 as well as assessment components 3 and 4. Students are highly recommended to attend both courses Experimentelle Physik 1 (Experimental Physics 1) and Experimentelle Physik 2 (Experimental Physics 2). The topics discussed in these two courses, together with the topics discussed in Mathematische Rechenmethoden (Mathematical Methods) 1 and 2, will be covered in assessment component 5. Students must register for assessment components 1 through 5 online (details to be announced). To pass this module, students must first pass assessment component 1 or 2 as well as assessment components 3 and 4 and must then pass assessment component 5.						

The grade achieved in assessment component 5 will be the overall grade awarded for the module as a whole.

Allocation of places

Additional information

Workload

Teaching cycle

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 77 (1) 1. a) Physik "Grundlagen der Experimentalphysik"

Module appears in

First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013) No final examination Special study offering (2010)

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Module title				Abbreviation		
Modern Physics 1 11-P-MP1-092-m01						
Module coordinator			Module offered by			
Managing Director of the Institute of Ar		Applied Physics	Faculty of Physics a	ind Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	undergraduate Prior completion of module 11-P-E is recommended. Certain prerequise must be met to qualify for admission to assessment. The lecturer will form students about the respective details at the beginning of the co se. Registration for the course will be considered a declaration of will seek admission to assessment. If students have obtained the qualifier on for admission to assessment over the course of the semester, the turer will put their registration for assessment into effect. Students w meet all prerequisites will be admitted to assessment in the current of the subsequent semester. For assessment at a later date, students w		orerequisites turer will in- of the cour- on of will to e qualificati- ster, the lec- udents who current or in udents will t anew.			
Conten	ts					
Fundan photon interfer system ment a	nental s: Radi rence e s, ques nd spir	experiments: Atoms: S ation laws, photoelect xperiments, matter way stions of interpretation, n, atomic structure, Per	pecification of atomic v ric effect, Compton effe ve, Schrödinger equatio recent experiments; q iodic Table of the Elemo	values, masses and e ect; electrons: Eleme on, uncertainty relati uantum mechanics o ents	energies, Rutherford ntary charge, e/m de on, simple quantum of hydrogen atoms, n	scattering; etermination, mechanical nagnetic mo-
Intende	ed lear	ning outcomes				
The stu have co central ply and	idents s onsolid though I proces	gain insights into the b ated and structured kn nts and key experiment ss relevant problems.	asic differences betwee owledge of the mentions and of measuring me	en classical and qua ned contents; they h thods and scales of	ntum physical descri ave knowledge of th central values and a	iption, they e relevant re able to ap-
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
V + Ü (r	no infoi	rmation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
Method module is	d of ass s creditab	sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether
a) writt oral exa	en exai aminat	mination (approx. 120 i ion in groups (approx. ;	ninutes; usually chose 30 minutes per candida	n) or b) oral examina ate)	ation of one candidat	te each or c)
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 53 (1) 1. b) Physik Aufbau der Materie § 77 (1) 1. c) Physik "Theoretische Physik"						
Module appears in						
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First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013)

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Modul	Module title Abbreviation				
Lab Co	Lab Course B 11-P-PB-L-092-m01				
Modul	e coordi	nator		Module offered by	
Manag	ing Dire	ctor of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	d of grading	Only after succ. con	npl. of module(s)	
6	(not) s	uccessfully completed	11-P-PA		
Duratio	on	Module level	Other prerequisites		
1 seme	semester undergraduate				
Conter	nts				
Physic	Physical laws of the science of electricity, circuits with electrical components and Atomic and Nuclear Physics.				
Intend	ed learn	ing outcomes			
The stu are abl in a me	udents h le to ind easurem	ave knowledge and sk ependently plan and c ent protocol.	ills of physical measur onduct experiments in	ing instruments and cooperation with oth	experimental techniques. They ners, and to document the results
Course	es (type, nu	umber of weekly contact hours	, language — if other than Gei	rman)	
Elektriz Atom-	zitätsleh und Keri	re und Schaltungen (E 1physik (Atomic and N	lectricity and Circuits, uclear Physics, AKP): P	ELS): P (2 weekly cor (2 weekly contact he	itact hours) ours)
Metho module i	d of ass s creditabl	essment (type, scope, lang e for bonus)	uage — if other than German,	examination offered — if no	t every semester, information on whether
 Lab course in part 1. a) Preparing, performing and evaluating the experiments with be considered successful- ly completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). Lab course in part 2: a) Preparing, performing and evaluating the experiments will be considered successful- ly completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). Students must register for assessment components 1 and 2 online (registration deadline to be announced). Students will be offered one opportunity to retake element a) and/or element b). To pass an assessment compo- nent, they must pass both elements a) and b). Students must attend Elektrizitätslehre und Schaltungen (Electricity and Circuits) courses before attending Atom- und Kernphysik (Atomic and Nuclear Physics) courses. 					
Allocat	tion of p	laces			
Additio	onal info	rmation			
Worklo	bad				
Teachi	ng cycle	•			
Referre	ed to in I	POI (examination regulation	ons for teaching-degree progra	immes)	
Keterred to In LPO I (examination regulations for teaching-degree programmes) § 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 53 (1) 1. b) Physik Aufbau der Materie § 53 (1) 1. c) Physik physikalische Grundpraktika § 77 (1) 1. b) Physik "Fortgeschrittene Experimentalphysik" § 77 (1) 1. d) Physik "physikalische Praktika"					
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Module appears in

First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013)

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Module	Module title Abbreviation					
Demon	stratio	n Practical Course 1			11-P-DP1-092-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Physics and its D	idactics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	Contents					
Fundam used in hand ex tive scru cies.	nental (schoo kperim een exp	experiments of physics e l, goal setting and didact ents, model experiments periments, etc.; presenta	ducation in primary a ic potential of demor , etc.; computer-aide tion of experiments;	nd secondary level I nstration experiment d experiments; meas safety in physics edu	, knowledge of tools typically s, student experiments, free- sured value acquisition, interac- ucation, presentation competen-	
Intende	ed learn	ning outcomes				
Compete matic a and the learning safety s	tencies nalysis ir dida g goals tandar	in working with teaching of error sources of own e ctic potential; experience and group of pupils, exp ds of Physics classes.	g tools and experimer experiments; identific e in choosing, constru erience in using com	nting materials used cation of categories o ucting and presentin puterised demonstra	in commerce and school; syste- of experiments, their functions g experiments according to the ation and pupils experiments;	
Course	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
P (no in	format	ion on SWS (weekly cont	act hours) and course	e language available	.)	
Method module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
oral exa 20 mini	aminati utes)	on of one candidate eacl	h (approx. 10 minutes	s) or oral examinatio	n in groups (groups of 2, approx.	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	e				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
§ 53 (1) § 53 (1) § 77 (1)	§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 53 (1) 1. c) Physik physikalische Grundpraktika § 77 (1) 1. d) Physik "physikalische Praktika"					
Module	Module appears in					
First sta First sta First sta First sta First sta	First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013)					

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Module title A				Abbreviation		
Practio	Practice in Student Lab 11-P-LLL-092-m01					
Modul	e coord	inator		Module offered by	by	
holder	ofthe	Chair of Physics and its	Didactics	Faculty of Physics a	nd Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	,	
2	nume	rical grade		•		
Durati	on	Module level	Other prerequisites	i		
1 seme	ester	undergraduate	Modules 11-P-E, 11-F	P-FD1, 11-P-DP1 are re	commended.	
Conter	nts		,	,		
The module gives an overview of applicable physical experiments that provide an introduction to science and can be performed in teaching-learning-laboratories (M!ND center). In these experiments, different working me- thods are employed.						
Intend	ed lear	ning outcomes				
ve gair subjec to holo and to pupils	ned an o t-didac d scient raise th experir	overview of current dida tic research. They are a ific-propaedeutic class neir interest for current nents in a target-oriente	actic research topics ar ble to evaluate and as es, to positively influer physical research ques ed manner, and to sup	nd further possibilitie sess the (affective) le nce the motivation of stions. The students ervise pupils while e	es for development in the earning achievements of pupils in the subject of I are able to select, set up xperimenting.	e field of pupils, Physics or build
Course	es (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
S (no i	nforma	tion on SWS (weekly co	ntact hours) and cours	e language available	2)	
Metho module i	d of ass	Sessment (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	t every semester, information on	whether
a) oral modul of one plete:	examir es with candid 1 to 4 w	nation of one candidate less than 4 ECTS credit ate each or oral examin reeks)	each or oral examinat s approx. 20 minutes, ation in groups stated	ion in groups (appro: unless different leng) or b) term paper (ap	x. 30 minutes per candid th and mode of oral exar oprox. 6 to 12 pages, time	ate, for nination e to com-
Alloca	tion of _l	places				
Additi	onal inf	ormation				
	-					
Workle	ad					
Teachi	ng cycl	e				
Referr	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
§ 53 (1 § 53 (1 § 77 (1) 1. a) P) 1. c) P) 1. d) P	hysik Mechanik, Wärme hysik physikalische Gru hysik "physikalische Pr	elehre, Elektrizitätsleh Indpraktika aktika"	re, Optik, der speziel	len Relativitätstheorie	
Modul	e appea	ars in				
First st	ate exa	mination for the teachi	ng degree Grundschule	e Physics (2009)		
First st	ate exa	mination for the teaching	ng degree Hauptschule	Physics (2009)		I
First st	ate exa	mination for the teaching	ng degree Realschule F	Physics (2009)		
First St	ate exa	mination for the teaching	ng degree Gymnasium ng degree Mittelschuld	Physics (2009)		
11131 31	מוב כאמ		שה שבצובב אווננכוסנוועוב	. 1 11y 5105 (2013)		
LA Grunds	chulen Phy	/sics (2009)	JMU Würzburg • g cord Lehramt Gru	enerated 26-Aug-2024 • exam ndschulen (Unterrichtsfach) F	n. reg. data re- pag Physik - 2009	ge 16 / 36



Module titl	e			Abbreviation			
Modern Ph	ysics			11-P-MPH-092-m01			
Module coo	ordinator		Module offered by				
Managing [Director of the Institute of	Applied Physics	Faculty of Physics a	and Astronomy			
ECTS Me	thod of grading	Only after succ. con	Only after succ. compl. of module(s)				
5 nui	nerical grade						
Duration	Module level	Other prerequisites					
1 semester undergraduate		Prior successful con mended. Certain pre assessment. The lec tails at the beginnin considered a declar dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later admission to assess	Prior successful completion of modules 11-P-E and 11-P-MP1 is recom- mended. Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective de- tails at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for				
Contents							
Basics of S important of technology gy; energy;	olid-State Physics; Nucle concepts and application ; rules and process techn celestial mechanics, sate	ar Physics, Elementary F s; Applied and Technica ology, sensors; medica ellites, GPS; measuring	Particle Physics and Il Physics: Physics a I technology; climate devices; el. light sou	Astrophysics; introd nd information/com e and weather; Biop urces; displays	uction of munication hysics; ecolo-		
Intended le	arning outcomes						
The studen ture and en the solution	ts have structured knowle gineering and are able to ns to selected, complex p	edge of the aforementio connect their own phys roblems.	ned terms. They und sical knowledge in a	derstand complex sy synergetic manner b	stems of na- oy analysing		
Courses (typ	e, number of weekly contact hou	rs, language — if other than Ger	rman)				
V + Ü (no in	formation on SWS (week	ly contact hours) and co	ourse language avail	able)			
Method of a module is cred	assessment (type, scope, lan itable for bonus)	guage — if other than German, o	examination offered — if no	ot every semester, informat	ion on whether		
a) written e groups (ap	xamination (approx. 90 n prox. 20 minutes per can	ninutes) or b) oral exam didate)	ination of one candi	date each or oral ex	amination in		
Allocation	of places						
Additional	information						
Workload							
Teaching c	Teaching cycle						
 Deferred to		· · · · · · · · · · · · · · · · · · ·					
§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie § 53 (1) 1. b) Physik Aufbau der Materie							
Module ap	Module appears in						
First state e	First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009)						
LA Grundschulen	Physics (2009)	JMU Würzburg • ge cord Lehramt Gru	enerated 26-Aug-2024 • exan ndschulen (Unterrichtsfach)	n. reg. data re- Physik - 2009	page 17 / 36		



First state examination for the teaching degree Mittelschule Physics (2013)

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 18 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	1





Teaching

(12 ECTS credits)

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 19 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module	e title				Abbreviation		
Studen	it Lab S	upervision (Physics)			11-P-FD-LLL-092-mc)1	
Module	e coord	inator		Module offered by			
holder	of the (Chair of Physics and its	Didactics	dactics Faculty of Physics and Astronomy			
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)			
4	(not) s	successfully completed	1				
Duratio	on	Module level	Other prerequisites				
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for				
Conten	ts						
The mo can be thods a	odule gi perforr are emp	ves an overview of app ned in teaching-learnin ployed.tz.	olicable physical experi ng-laboratories (M!ND c	ments that provide a enter). In these expe	an introduction to sc eriments, different w	ience and orking me-	
Intende	ed lear	ning outcomes					
The stu ve gain subject to hold and to pupils	idents l ied an c t-didact scient raise th experin	know how to prepare a overview of current did tic research. They are a fic-propaedeutic class heir interest for current nents in a target-orient	nd follow-up a visit in a actic research topics ar ble to evaluate and ass es, to positively influer physical research quest red manner, and to sup-	teaching-learning-la od further possibilitions the (affective) la oce the motivation of stions. The students ervise pupils while e	aboratory (M!ND-Cer es for development i earning achievement pupils in the subject are able to select, se xperimenting.	iter) and ha- n the field of ts of pupils, ct of Physics et up or build	
Course	S (type, r	umber of weekly contact hou	rs, language — if other than Gei	rman)			
S (no ir	nformat	ion on SWS (weekly co	ontact hours) and cours	e language available	2)		
Metho module is	d of ass s creditab	s essment (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether	
a) writt c) oral tes, gro	en exa examin oups of	nination (approx. 45 n ation of one candidate 2)	ninutes) or b) term pape e each (approx. 10 minu	er (approx. 8 pages, t tes) or oral examina	time to complete: 1 t tion in groups (appro	o 4 weeks) or ox. 20 minu-	
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
	-						
Worklo	ad						
Teachi	ng cycl	e					
Referred to in LPO I (examination regulations for teaching-degree programmes)							
§ 53 (1) 2. Physik Fachdidaktik § 77 (1) 2. Physik Fachdidaktik							
Module	e appea	irs in					
LA Grundso	hulen Phy	rsics (2009)	JMU Würzburg • ge cord Lehramt Gru	enerated 26-Aug-2024 • exan ndschulen (Unterrichtsfach) I	n. reg. data re- Physik - 2009	page 20 / 36	

First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013)

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 21 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module title Abbreviation						
Teachi	Teaching 1 11-P-FD1-092-m01					
Module	e coord	inator		Module offered by		
holder	ofthe	Chair of Physics and its	Didactics	Faculty of Physics a	nd Astronomy	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites	5		
1 seme	ster	undergraduate	Prior completion of	module 11-P-E recom	imended.	
Conten	Its	<u>.</u>	·			
Studen technic gitimat elemen sics ed	nt preco ques to tion of p ntarisat lucation ed lear	onceptions and typical change student precon ohysics education, edu ion and didactic recons n and their application ning outcomes	learning difficulties in s nceptions; epistemolog cational goals of physi struction of physical co to support learning.	school physics, corre gical and working me cs, qualification moc ontents, methods of p	sponding teaching r thods of physics. Ju dels and educationa bhysics education, m	nethods and stification/le- l standards: nedia in phy-
In-dept learnin proach and go sical te	th unde g diffic es for s als of t eaching	erstanding of school-rel ulties; knowledge of ho selected topics; knowle he school subject Phys and working tools.	evant areas of Physics by to change student p dge of epistemologica ics; knowledge of elen	; knowledge of typica preconceptions; know l methods of Physics nentarising and teach	al student preconcep vledge of alternative ; knowledge of the l ning methods; know	otions and teaching ap- egitimation ledge of phy-
Course	S (type, 1	number of weekly contact hour	s, language — if other than Ge	rman)		
ster) Einführ ce a ye Metho	rung Fa ar (sun d of as s	chdidaktik 2 (Introduct nmer semester) Sessment (type, scope, lang	ion to Didactics 2): V (1 weekly contact hou examination offered — if no	r) + Ü (1 weekly cont	act hour), on- ion on whether
 module is creditable for bonus) This module has the following assessment components 1. Seminar (Einführung Fachdidaktik 1/Introduction to Didactics 1): term paper (approx. 8 pages) or presentation (approx. 30 minutes) or oral examination of one candidate each (approx. 10 minutes) or oral examination ir groups (approx. 20 minutes, groups of 2 candidates). 2. Topics covered in lectures and exercises (Einführung Fachdidaktik 2/Introduction to Didactics 2): written examination (approx. 45 minutes) or term paper (approx. 8 pages) or presentation (approx. 30 minutes) or oral examination of one candidate each (approx. 8 pages) or presentation (approx. 30 minutes) or oral examination (approx. 45 minutes) or term paper (approx. 8 pages) or presentation (approx. 30 minutes) or oral examination of one candidate each (approx. 10 minutes) or oral examination in groups (approx. 20 minutes, groups of 2 candidates). 					presentati- xamination in written ex- tes) or oral o minutes,	
To pas	s this n	nodule, students must	pass both assessment	component 1 and as	sessment compone	nt 2.
Allocat	ion of	places				
Additional information						
Important information on number and allocation of places: There is a restricted number of places. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will be allocated according to the number of subject semesters/ECTS credits (1st: studying in 3rd subject semester or higher, 2nd: has achieved a minimum of 50 ECTS credits, and 3rd: highest number of subject semesters if studying in 1st or 2nd subject semester). Among applicants with the same number of subject semesters/ECTS credits, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.						
LA Grundso	chulen Phy	ysics (2009)	JMU Würzburg • g cord Lehramt Gru	enerated 26-Aug-2024 • exan Indschulen (Unterrichtsfach) F	1. reg. data re- Physik - 2009	page 22 / 36

Workload

Teaching cycle

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 36 (1) 7. Didaktik der Grundschule Physik

§ 38 (1) 1. Didaktik der Hauptschule Physik

§ 38 (1) 1. Didaktik der Mittelschule Physik

§ 53 (1) 2. Physik Fachdidaktik

§ 77 (1) 1. a) Physik "Grundlagen der Experimentalphysik"

§ 77 (1) 2. Physik Fachdidaktik

Module appears in

First state examination for the teaching degree Grundschule Physics (2009)

First state examination for the teaching degree Hauptschule Physics (2009)

First state examination for the teaching degree Realschule Physics (2009)

First state examination for the teaching degree Gymnasium Physics (2009)

First state examination for the teaching degree Mittelschule Physics (2013)

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 23 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Teaching Seminar Fundamental Princip	ples		11-P-EL-092-m01			
		Teaching Seminar Fundamental Principles 11-P-EL-092-m01				
Module coordinator	Module offered by					
holder of the Chair of Physics and its D	idactics	Faculty of Physics a	nd Astronomy			
ECTS Method of grading	Only after succ. com	pl. of module(s)				
4 (not) successfully completed						
Duration Module level	Other prerequisites					
1 semesterundergraduatePrior completion of module 11-P-E is recommended. Certain pre must be met to qualify for admission to assessment. The lecture form students about the respective details at the beginning of t se. Registration for the course will be considered a declaration seek admission to assessment. If students have obtained the q on for admission to assessment over the course of the semeste turer will put their registration for assessment into effect. Stude meet all prerequisites will be admitted to assessment in the cur the subsequent semester. For assessment at a later date, stude have to obtain the qualification for admission to assessment at a cur assessment at a later date.			orerequisites turer will in- of the cour- on of will to e qualificati- ster, the lec- udents who current or in udents will t anew.			
Contents						
Physical and interdisciplinary aspects of ceptions and typical learning difficulties sed on specific contents of physics edu pical school experiments and suitable	of selected topics of pes, elementarisation a ucation, verbalisation media.	ohysics education, c and didactic reconstr of physical contents	orresponding studer ruction of physical co s, possible teaching	nt precon- ontents ba- methods, ty-		
Intended learning outcomes						
Advanced, qualitative knowledge of sc student preconceptions and special me Physics at university and school regard	hool-relevant areas o edia on relevant topic ling contents and me	f Physics; knowledges; awareness of the thods.	e of common metho differences betweeı	ds, typical ı teaching		
Courses (type, number of weekly contact hours, l	anguage — if other than Ger	man)				
S (no information on SWS (weekly cont	act hours) and cours	e language available)			
Method of assessment (type, scope, langua module is creditable for bonus)	ge — if other than German, e	examination offered — if no	t every semester, informati	on on whether		
a) term paper (approx. 8 pages, time to prox. 45 minutes) or c) written examina (approx. 15 minutes) or e) oral examina	o complete: 1 to 4 wee ation (approx. 45 mini ation in groups (group	eks) or b) presentatio utes) or d) oral exam os of 2, approx. 30 m	on/seminar presenta ination of one candi inutes)	ation (ap- date each		
Allocation of places						
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations	s for teaching-degree progra	mmes)				
§ 53 (1) 2. Physik Fachdidaktik						
Module appears in						
First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009)						
LA Grundschulen Physics (2009)	JMU Würzburg ● ge cord Lehramt Grur	nerated 26-Aug-2024 • exam ndschulen (Unterrichtsfach) P	1. reg. data re- Physik - 2009	page 24 / 36		





First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013)

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	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	





Extra Skills (ECTS credits)

Teaching degree students must take modules worth a total of 15 ECTS credits in the area Freier Bereich (general as well as subject-specific electives) (Section 9 LASPO (general academic and examination regulations for teaching-degree programmes)). To achieve the required number of ECTS credits, students may take any modules from the areas below.

Freier Bereich -- interdisciplinary: The interdisciplinary additional offer for a teaching degree can be found in the respective Annex "Ergänzende Bestimmungen für den "Freien Bereich" im Rahmen des Studiums für ein Lehramt".

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Physics (ECTS credits)

(Freier Bereich (general as well as subject-specific electives) -- subject specific)

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	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module title			Abbreviation		
Studer	Student Lab Supervision (Physics) 11-P-FB-LLL-121-m01				
Module coordinator Module offered			Module offered by		
holder	of the (Chair of Physics and its D	idactics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
2	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate	This module can be the natural sciences	chosen by students	studying at least one subject in
Conter	its				
The mo in the t	odule pr eachin	rovides an introduction t g-learning-laboratory.	o successful supervis	ion of pupils indepe	ndently carrying out experiments
Intend	ed lear	ning outcomes			
vel of p experin ly and ve beh terns b control	ndents i perform menting criticall aviour j y repea	earn to classify different ance, to support the pup g (supervision competen y evaluate their own acti patterns and to support t itedly working on the sar etencies).	groups of pupils acco ils according to their cies in open classroon ons. A lecturer gives i he students' strength ne topic with differen	needs and age and t m situations). The stu ndividual feedback t s. The students deve t groups of pupils (re	o help them during independent udents are able to methodical- to the students to avoid negati- elop professional behaviour pat- flection competencies and self-
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	rman)	
S (no i	nformat	ion on SWS (weekly con	tact hours) and cours	e language available)
Metho module i a) writt or c) ex groups	d of ass s creditab cen exan (aminat of 2)	sessment (type, scope, langua le for bonus) mination (approx. 45 mir cion of one candidate eac	age — if other than German, d nutes) or b) term pape ch (approx. 10 minute	examination offered — if no er (approx. 8 pages, t s) or d) examination	t every semester, information on whether ime to complete: 1 to 4 weeks) in groups (approx. 20 minutes,
Allocat	ion of p	olaces			
			_		
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Modul	e appea	ars in			
First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Hauptschule Didactics in Physics (Secondary School) (2009)					
First st	First state examination for the teaching degree Realschule Physics (2009)				
First st	ate exa	mination for the teaching	g degree Gymnasium	Physics (2009)	
First st	ate exa	mination for the teaching	g degree Sonderpäda g degree Sondorpäda	gogik Didactics in Ph gogik Didactics in Ph	iysics (Secondary School) (2009)
First st	ate exa	mination for the teaching	g degree Mittelschule	Physics (2013)	ysics (Milaule School) (2013)
LA Grunds	A Grundschulen Physics (2009) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re- cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009				





First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2013)

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	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module title				Abbreviation			
Low Cost - High Impact. Low-Budget Experiments for Science Courses (Phy-			11-MIND-Ph1-121-m01				
sics)							
Module coor	dinator		Module offered by				
holder of the	Chair of Physics and its D	idactics	Faculty of Physics a	nd Astronomy			
ECTS Meth	od of grading	Only after succ. com	pl. of module(s)				
2 (not)	successfully completed						
Duration	Module level	Other prerequisites					
1 semester	undergraduate	This module can be the natural sciences	chosen by students ·	studying at least one subject in			
Contents							
Conception a Grundschule	nd realisation of experime and secondary level I.	ental stations with or	dinary and inexpens	ive consumables for classes of			
Intended lea	rning outcomes						
The students ry level I for s contents rele	develop simple scientific mall groups from differen vant to the curriculum in o	experimenting statio t types of schools. In due consideration of t	ns to use for the trar doing so, they learn he target group.	nsition from primary to seconda- to simplify and convey scientific			
Courses (type,	number of weekly contact hours, l	anguage — if other than Ger	man)				
S (no inform	ation on SWS (weekly cont	act hours) and cours	e language available)			
Method of as	sessment (type, scope, langua	ge — if other than German, e	examination offered — if no	t every semester, information on whether			
module is credita	ble for bonus)		(• • • • • • • • • • • • • • • • • • • •			
a) written exa or c) examina groups of 2)	amination (approx. 45 min ation of one candidate eac	utes) or b) term pape h (approx. 10 minute:	r (approx. 8 pages, t s) or d) examination	in groups (approx. 20 minutes,			
Allocation of	nlaces						
Additional in	formation						
Workload							
Teaching cyc	le						
Referred to i	n LPO I (examination regulation	s for teaching-degree progra	mmes)				
Module appe	ars in						
First state ex First state ex	First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2009)						
First state ex	First state examination for the teaching degree Hauptschule Physics (2009)						
First state ex	amination for the teaching	g degree Hauptschule	Didactics in Physics	s (Secondary School) (2009)			
First state ex	amination for the teaching	g degree Gymnasium	Physics (2009)				
First state ex	amination for the teaching	g degree Sonderpäda	gogik Didactics in Ph	nysics (Secondary School) (2009)			
First state ex	amination for the teaching	g degree Sonderpäda	gogik Didactics in Ph	nysics (Middle School) (2013)			
First state ex	amination for the teaching	g degree Mittelschule	irst state examination for the teaching degree Mittelschule Physics (2013)				
First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2013)							

LA Grundschulen Physics (2009) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Lehramt Grundschulen (Unterrichtsfach) Physik - 2009 page 30 / 36

Teaching Science with Hands-on-Exhibits (Physics) 11-MIND-Ph2-121	L-M01			
Module coordinator Module offered by				
holder of the Chair of Physics and its Didactics Faculty of Physics and Astronomy				
ECTS Method of grading Only after succ. compl. of module(s)				
2 (not) successfully completed				
Duration Module level Other prerequisites				
1 semester undergraduate This module can be chosen by students studying at least the natural sciences.	one subject in			
Contents				
Designing and creating hands-on exhibits for STEM subjects.				
Intended learning outcomes				
The students evaluate the advantages and disadvantages of the hands-on approach for teaching tents in and out of school. They plan and implement an interdisciplinary science exhibition as an ject-oriented work with pupils of secondary level I and II.	scientific con- example of pro-			
Courses (type, number of weekly contact hours, language — if other than German)				
S (no information on SWS (weekly contact hours) and course language available)				
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, inform module is creditable for bonus)	mation on whether			
a) written examination (approx. 45 minutes) or b) term paper (approx. 8 pages, time to complete: or c) examination of one candidate each (approx. 10 minutes) or d) examination in groups (appro- groups of 2)	1 to 4 weeks) x. 20 minutes,			
Allocation of places				
Additional information				
Workload				
Teaching cycle				
Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module appears in				
First state examination for the teaching degree Grundschule Physics (2009)				
First state examination for the teaching degree Grundschule Didactics in Physics (Primary School)) (2009)			
First state examination for the teaching degree Hauptschule Physics (2009)				
First state examination for the teaching degree Hauptschule Didactics in Physics (Secondary Scho	001) (2009)			
First state examination for the teaching degree Gymnasium Physics (2009)				
First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Secondary School) (200				
First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle Scl	hool) (2013)			
First state examination for the teaching degree Mittelschule Physics (2013)	<i>.</i>			
First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School)	(2013)			

Module title			Abbreviation			
Preparatory Course Mathematics			11-P-VKM-092-m01			
Module coordinator			Module offered by			
Managi the Inst	ng Dire itute o	ectors of the Institute of f Theoretical Physics ar	Applied Physics and Astrophysics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
2	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for			o as- ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as- alification for
Conten	ts					
Principl the intr and alg Integral	es of n oductio ebra 2 calcul	nathematics and eleme on to and preparation o . Coordinate systems a us	ntary calculation meth f the modules of Exper nd complex numbers 3	ods from school and imental and Theoret . Vectors - vectored v	l partially beyond, es ical Physics. 1. Basic /alues 4. Differential	specially for geometry calculus 5.
Intende	ed learı	ning outcomes				
The stu success	dents l sfully s	know the principles of r tudying Theoretical and	nathematics and elem I Experimental Physics	entary calculation m •	ethods which are re	quired for
Courses	5 (type, n	number of weekly contact hours	, language — if other than Ge	rman)		
T (no in	format	ion on SWS (weekly co	ntact hours) and cours	e language available)	
Method module is	l of ass creditab	Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
discuss Assessi and wil examin	ion an ment o l be an ation r	d exercises (approx. 15 ffered: When and how nounced in due form u egulations) 2009.	minutes) often assessment will l nder observance of Se	pe offered depends offered strain 32 Subsection 3	on the method of ass 3 ASPO (general aca	sessment demic and
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Reterred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Bachelo	or' deg	ree (1 major) Physics (2	012)			
LA Grundsc	hulen Phy	rsics (2009)	JMU Würzburg ● ge cord Lehramt Gru	enerated 26-Aug-2024 • exam ndschulen (Unterrichtsfach) F	n. reg. data re- Physik - 2009	page 32 / 36

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Nanostructure Technology (2012) First state examination for the teaching degree Grundschule Physics (2009) First state examination for the teaching degree Hauptschule Physics (2009) First state examination for the teaching degree Realschule Physics (2009) First state examination for the teaching degree Gymnasium Physics (2009) First state examination for the teaching degree Mittelschule Physics (2013) No final examination Special study offering (2010)

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 33 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module title			Abbreviation		
Experiments for science courses in primary schools			11-P-GS-FB-NE-092-m01		
Module coordinator				Module offered by	
holder	of the C	Chair of Physics and its D	idactics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
2	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Scientil current precon	fic teac curricu ception	hing in Science and Soci Ilum of Grundschule; pup Is	al Studies of Grundso bils experiments in pl	chule; physical and c nysical and chemical	chemical contexts suitable for the l contexts; characteristic student
Intende	ed learr	ning outcomes			
Unders experin conduc	tanding nents s ting ex	g of physical and chemica uitable for Grundschule v periments	al contexts; knowled with accessible and a	ge of typical learning ffordable materials;	difficulties; knowledge of pupils competencies in developing and
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)
Methoo module is	d of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) writte didate	en exar each (a	nination (approx. 45 min pprox. 10 minutes) or d)	utes) or b) term pape oral examination in g	r (approx. 8 pages) o groups (approx. 20 m	or c) oral examination of one can- ninutes, groups of 2)
Allocat	ion of p	olaces			
Number of places: 20. Places will be allocated according to the number of subject semesters/ECTS credits (1st: studying in 3rd subject semester or higher, 2nd: has achieved a minimum of 50 ECTS credits, and 3rd: highest number of subject semesters if studying in 1st or 2nd subject semester). Among applicants with the same number of subject semesters/ECTS credits, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.					
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	irs in			
First sta	ate exa	mination for the teaching	degree Grundschule	Physics (2009)	
First sta	First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2009)				





Thesis

(10 ECTS credits)

Preparation of a written Hausarbeit (thesis) in accordance with the provisions of Section 29 LPO I (examination regulations for teaching-degree programmes) is a prerequisite for teaching degree students to be admitted to the Erste Staatsprüfung (First State Examination). In accordance with the provisions of Section 29 LPO I, students studying for a teaching degree Grundschule may write this thesis in the subject Didaktik der Grundschule (Didactics of Grundschule), in the subject they selected as Unterrichtsfach (subject studied with a focus on the scientific discipline) or in the subject Erziehungswissenschaften (Educational Science). Pursuant to Section 29 Subsection 1 Sentence 2 LPO I, students may also choose to write an interdisciplinary thesis.

LA Grundschulen Physics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 35 / 36
	cord Lehramt Grundschulen (Unterrichtsfach) Physik - 2009	

Module title					Abbreviation		
Thesis in Physics Primary School					11-P-GS-UF-HA-092-m01		
Module coordinator				Module offered by			
chairperson of examination committee			_	Faculty of Physics and Astronomy			
ECTS Method of grading		Only after succ. compl. of module(s)					
10	nume	rical grade					
Duration Module level		Other prerequisites					
1 semester undergraduate Where applicable, specific modules as specified by supervisor.				pecified by supervisor.			
Contents							
Independent processing of a topic of Physics and/or Didactics of Physics, chosen in consultation with a lecturer.							
Intended learning outcomes							
The students are able to independently work on a predetermined physical topic while applying the knowledge and methods acquired in the teaching degree programme. They are able to present their results in written form in due consideration of didactic aspects.							
Courses (type, number of weekly contact hours, language — if other than German)							
no courses assigned							
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)							
written thesis (approx. 40 pages) Language of assessment: German, exceptions in accordance with Section 29 Subsection 4 LPO I (examination re- gulations for teaching degree programmes)							
Allocation of places							
Additio	onal inf	ormation					
Additional information on module duration: 1 to 2 semesters.							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
First state examination for the teaching degree Grundschule Physics (2009)							