

Module Catalogue

for the Subject

Didactics in Physics (Middle School)

as Didaktikfach

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

> Examination regulations version: 2015 Responsible: Faculty of Physics and Astronomy

JMU Würzburg • generated 18-Apr-2025 • exam. reg. data record L7|873|-|-|H|2015



Contents

The subject is divided into	3
Learning Outcomes	4
Abbreviations used, Conventions, Notes, In accordance with	5
Compulsory Courses	6
Physics Teaching Concepts 1	7
Physics Teaching Concepts 2	9
Physics 1 for Primary and Secondary General School	11
Physics 2 for Primary and Secondary General School	12
Physics 3 for Primary and Secondary General School	13
Freier Bereich (general as well as subject-specific electives)	14
Physics	15
Teaching Seminar Fundamental Principles	16
Selected Topics in Physics Didactics	18
Preparatory Course Mathematics	20
Student Lab Supervision (Physics)	22
Low Cost - High Impact. Low-budget Experiments for Science Courses (Physics)	24
Teaching Science with Hands-on-Exhibits (Physics)	26
Astrophysics	28
Principles of Energy Technologies	30
Current Topics of Teaching Concepts in Physics	32
Scientific Work in Teaching Concepts	34
Current Topics in Physics	36
Selected Topics of Physics	38
Thesis	40
Thesis in Physics Secondary General School	41



The subject is divided into

section / sub-section	ECTS credits	starting page
Compulsory Courses	20	6
Freier Bereich (general as well as subject-specific electives)		14
Physics		15
Thesis	10	40

Learning Outcomes

UNIVERSITÄT

WÜRZBURG

German contents and learning outcome available but not translated yet.

Wissenschaftliche Befähigung

- Die Absolventinnen und Absolventen verstehen die Grundlagen der Physik und können diese anwenden.
- Die Absolventinnen und Absolventen können unter Anleitung Experimente durchführen, analysieren und die erhaltenen Ergebnisse darstellen und bewerten.
- Die Absolventinnen und Absolventen besitzen ein grundlegendes Abstraktionsvermögen und die Fähigkeit, komplexe Zusammenhänge zu strukturieren.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolventinnen und Absolventen können fachliche Inhalte und ihre Erkenntnisse didaktisch aufbereiten und adressatengerecht vermitteln.
- Die Absolventinnen und Absolventen kennen Konzepte, Prinzipien, Methoden und evidenzbasierte Erkenntnisse aus dem Bereich der Physikdidaktik und können diese zur ziel- und adressatengerechten Ausgestaltung von Lehr/Lern-Settings anwenden.
- Die Absolventinnen und Absolventen können den Einsatz von Experimenten und Medien im Physikunterricht und die Betreuung von Schülerinnen und Schülern an ausgewählten Lehr-Lernsituationen wissenschaftlich fundiert reflektieren.

Persönlichkeitsentwicklung

- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und beachten sie.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse in einer Lehrsituation angemessen und selbstbewusst darstellen.
- Die Absolventinnen und Absolventen besitzen die Fähigkeit didaktisches Wirken in einer Lehr-/ Lernsituation angemessen zu reflektieren und passende Schlussfolgerungen zu ziehen.

Befähigung zum gesellschaftlichen Engagement

- Die Absolventinnen und Absolventen haben ihr Wissen bezüglich wirtschaftlicher, gesellschaftlicher, naturwissenschaftlicher, kultureller etc. Fragestellungen erweitert (z.B im Hinblick auf Bildung für nachhaltige Entwicklung) und können begründet Position beziehen.
- Die Absolventinnen und Absolventen entwickeln die Bereitschaft und Fähigkeit, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.



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:

LASPO2015

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

20-Oct-2015 (2015-219)

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.





Compulsory Courses

(20 ECTS credits)

Successful completion of modules worth 20 ECTS credits in each subject selected as Didaktikfach (subject studied with a focus on teaching methodology) is a prerequisite for admission to the Erste Staatsprüfung (First State Examination) in the subject Didaktiken einer Fächergruppe der Mittelschule (Didactics of a Group of Subjects of Mittelschule).

Module	e title				Abbreviation		
Physic	Physics Teaching Concepts 1 11-L-PD1-152-m01						
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
2	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	its						
teachin	ng conc methoo	tic study of technical co epts. Student preconce ds, and techniques to c	ptions and typical lear	ning difficulties in so	chool physics, corres	sponding te-	
Intende	ed learr	ning outcomes					
learnin proach and go	g diffic es for s als of tł	rstanding of school-rel ulties; knowledge of ho elected topics; knowle ne school subject Phys and working tools.	w to change student p dge of epistemological	reconceptions; know methods of Physics	ledge of alternative knowledge of the le	teaching ap- egitimation	
Course	S (type, n	umber of weekly contact hours	s, language — if other than Gei	rman)			
V (2)							
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
b) oral c) oral	examin examin	nination (approx. 45 m ation of one candidate ation in groups (groups ssessment: German an	each (approx. 10 minu 5 of 2, approx. 10 minu				
Allocat	ion of p	olaces					
Additio	onal info	ormation					
Worklo	ad						
60 h							
Teachi	ng cyclo	9					
Referre	ed to in	LPOI (examination regulation	ons for teaching-degree progra	immes)			
§ 36 N § 38 N § 53 N	Referred to in LPO I (examination regulations for teaching-degree programmes) § 36 Nr. 7 § 38 Nr. 1 § 53 Nr. 2 § 77 Nr. 2						
Module	e appea	rs in					
First sta First sta First sta First sta	ate exa ate exa ate exa ate exa	mination for the teachi mination for the teachi	ng degree Grundschule ng degree Realschule F ng degree Gymnasium ng degree Sonderpäda	e Didactics in Physics Physics (2015) Physics (2015) gogik Didactics in Ph			
LA Mittelsc	hulen Dida	actics in Physics (Middle	JMU Würzburg • g	enerated 18-Apr-2025 • exam		page 7 / 41	
School) (20	515)		cord Lenramt M	ittelschulen (Didaktikfach) Ph	iysik - 2015		



First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015)

Module title					Abbreviation	
Physics Teaching Concepts 2					11-L-PD2-152-m01	
Module	e coord	inator		Module offered by		
Managi	ing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
3	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
tional g	goals of on of pl	he basic knowledge of s f physics, qualification r nysical contents, metho rning.	nodels and education	al standards: elemer	ntarisation and dida	ctic recon-
Intende	ed lear	ning outcomes				
learning proach and goa	g diffic es for s als of t	erstanding of school-rele ulties; knowledge of how selected topics; knowled he school subject Physic and working tools.	w to change student p lge of epistemologica	reconceptions; know methods of Physics	ledge of alternative ; knowledge of the le	teaching ap- egitimation
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
V (2) +	Ü (1)		_			
		sessment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informati	on on whether
b) oral c) oral e d) term	examir examin paper ge of a	mination (approx. 45 mi nation of one candidate nation in groups (groups (approx. 8 pages) ssessment: German and	each (approx. 10 minu of 2, approx. 10 minu			
Allocal		JIACES				
 Additio	nalinf	ormation				
Auuilio	ilat illi					
Worklo	ad					
90 h	au					
Teachir		0	_			
Teacim	ig cyci	c				
Referre	d to in	LPOI (examination regulatio	ns for teaching-degree progra	mmes)		
§ 36 N § 38 N § 53 N § 77 N	lr. 1 Ir. 2					
		ars in				
Module appears inFirst state examination for the teaching degree Grundschule Physics (2015)First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015)First state examination for the teaching degree Realschule Physics (2015)First state examination for the teaching degree Gymnasium Physics (2015)First state examination for the teaching degree Gymnasium Physics (2015)First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015)						
LA Mittelscl School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam ittelschulen (Didaktikfach) Pr		page 9 / 41





First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015)

Module	title				Abbreviation
Physics	5 1 for F	Primary and Secondary G	eneral School		11-L-SP1-152-m01
Module coordinator Module offe					
holder	of the C	Chair of Physics and its D	idactics	Faculty of Physics a	ind Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
		rical grade			
5 Duratio	I	Module level	Other prerequisites		
1 seme		undergraduate			
Conten					
Physica	al conte	ents (mechanics, thermoo und- and Hauptschule.	dynamics) relevant to	classes in Natural S	Sciences or technical-natural
Intende	ed learr	ning outcomes			
classes demon	in Gru stratior	nd- and Hauptschule; kn n and pupils experiments	owledge of typical ap	proaches to the imp	scientific or technical-scientific olementation and evaluation of
		umber of weekly contact hours, l	anguage — If other than Ger	iiidfi)	
V (3) +			·		
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
	ge of a	ation in groups (groups o ssessment: German and, places		es per candidate)	
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachi	ng cycle	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 36 N § 38 N	lr. 7				
Module		irs in			
First sta First sta First sta First sta First sta First sta	ate exa ate exa ate exa ate exa ate exa ate exa	mination for the teaching mination for the teaching	g degree Sonderpäda g degree Mittelschule g degree Grundschule g degree Sonderpäda g degree Mittelschule g degree Grundschule	gogik Didactics in Ph Didactics in Physics Didactics in Physics gogik Didactics in Ph Didactics in Physics Didactics in Physics	s (Primary School) (2018) nysics (Middle School) (2018)
		mination for the teaching mination for the teaching			-

mouule	e title				Abbreviation
Physics	s 2 for I	Primary and Secondary (General School		11-L-SP2-152-m01
Module coordinator				Module offered by	Ι
holder	of the (Chair of Physics and its D	Didactics	Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
		rical grade			
5 Duratio	·	Module level			
			Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
		ents (science of electricit und- and Hauptschule.	y, electronics) releva	nt to classes in Natu	ral Sciences or technical-natura
		ning outcomes			
		-		elevant contents of	scientific or technical-scientific
					plementation and evaluation of
		n and pupils experiments		,	
		umber of weekly contact hours,	-	rman)	
V (3) +		,		·	
-		accmont (if all and the C		A second s
		le for bonus)	age — If other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 mir			
	en exai	11111ation (applox, 90 1111			
h) oral	examin			ites) or	
		ation of one candidate e	each (approx. 15 minu	-	
c) oral	examin		each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral Langua	examin ge of a	ation of one candidate e ation in groups (groups ssessment: German and	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral	examin ge of a	ation of one candidate e ation in groups (groups ssessment: German and	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat 	examin ge of a ion of p	ation of one candidate e ation in groups (groups ssessment: German and places	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat 	examin ge of a ion of p	ation of one candidate e ation in groups (groups ssessment: German and	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat Additio	examin ge of a ion of p nal info	ation of one candidate e ation in groups (groups ssessment: German and places	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat Additio Worklo	examin ge of a ion of p nal info	ation of one candidate e ation in groups (groups ssessment: German and places	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat Additio Worklo 150 h	examin ge of a ion of p nal info ad	ation of one candidate e ation in groups (groups ssessment: German and olaces ormation	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat Additio Worklo	examin ge of a ion of p nal info ad	ation of one candidate e ation in groups (groups ssessment: German and olaces ormation	each (approx. 15 minu of 2, approx. 15 minut	-	
c) oral (Langua Allocat Additio Worklo 150 h Teachin 	examin ge of a ion of p nal info ad	ation of one candidate e ation in groups (groups ssessment: German and olaces ormation	each (approx. 15 minu of 2, approx. 15 minut /or English	tes per candidate)	
c) oral (Langua Allocat Additio Worklo 150 h Teachin 	examin ge of a ion of p nal info ad ng cyclo	ation of one candidate e ation in groups (groups ssessment: German and olaces ormation	each (approx. 15 minu of 2, approx. 15 minut /or English	tes per candidate)	
c) oral (Langua Allocat Additio Worklo 150 h Teachin Referre	examin ge of a ion of p nal info ad ng cyclo ed to in Ir. 7	ation of one candidate e ation in groups (groups ssessment: German and olaces ormation	each (approx. 15 minu of 2, approx. 15 minut /or English	tes per candidate)	
c) oral (Langua Allocat Additio Worklo 150 h Teachin Referre § 36 I N	examin ge of a ion of p nal info ad ad ed to in Ir. 7 Ir. 1	ation of one candidate e ation in groups (groups ssessment: German and places ormation e LPO I (examination regulation	each (approx. 15 minu of 2, approx. 15 minut /or English	tes per candidate)	
c) oral (Langua Allocat Additio Worklo 150 h Teachin Referre § 36 N § 38 N Module	examin ge of a ion of p nal info ad ad ng cyclo ed to in lr. 7 lr. 1 e appea	ation of one candidate e ation in groups (groups ssessment: German and places ormation e LPO I (examination regulation	each (approx. 15 minu of 2, approx. 15 minut /or English	ammes)	s (Primary School) (2015)
c) oral (Langua Allocat Additio Worklo 150 h Teachin Referre § 36 l N § 38 l N Module First sta	examin ge of a ion of p mal info ad ad ed to in Ir. 7 Ir. 1 e appea ate exa	ation of one candidate e ation in groups (groups ssessment: German and places ormation e LPO I (examination regulation ars in mination for the teaching	each (approx. 15 minu of 2, approx. 15 minut /or English s for teaching-degree progra	ammes) e Didactics in Physic	s (Primary School) (2015) hysics (Middle School) (2015)
c) oral (Langua Allocat Additio 150 h Teachin § 36 N § 38 N Module First sta First sta	examin ge of a ion of p mal info ad ad ed to in lr. 7 lr. 1 e appea ate exa ate exa	ation of one candidate e ation in groups (groups ssessment: German and places ormation e LPO I (examination regulation ars in mination for the teaching	each (approx. 15 minu of 2, approx. 15 minu /or English 	ammes) e Didactics in Physic gogik Didactics in Physic	nysics (Middle School) (2015)
c) oral (Langua Allocat Additio Worklo 150 h Teachin § 36 N § 38 N § 38 N Module First sta First sta First sta	examin ge of a ion of p nal info ad ad d to in lr. 7 lr. 1 e appea ate exa ate exa ate exa	e LPOI (examination regulation in groups to the teaching mination for	each (approx. 15 minu of 2, approx. 15 minu /or English 	ammes) e Didactics in Physic gogik Didactics in Physics	nysics (Middle School) (2015)
c) oral (Langua Allocat Additio Worklo 150 h Teachin Referre § 36 N § 38 N Module First sta First sta First sta First sta	examin ge of a ion of p mal info ad ad ad ad ad ad ad ad ad ad ad ad ad	e LPOI (examination regulation in groups to the teaching mination for	each (approx. 15 minut of 2, approx. 15 minut /or English s for teaching-degree progra g degree Grundschule g degree Mittelschule g degree Grundschule	ammes) e Didactics in Physic gogik Didactics in Physics e Didactics in Physics	nysics (Middle School) (2015) 5 (Middle School) (2015)
c) oral c Langua Allocat Additio Worklo 150 h Teachin Referre § 36 I N § 38 I N Module First sta First sta First sta First sta	examin ge of a ion of p mal info ad ad ed to in Ir. 7 Ir. 1 e appea ate exa ate exa ate exa ate exa ate exa ate exa	ation of one candidate e ation in groups (groups ssessment: German and places ormation e LPO I (examination regulation mination for the teaching mination for the teaching	each (approx. 15 minu of 2, approx. 15 minut /or English s for teaching-degree progra g degree Grundschule g degree Mittelschule g degree Grundschule g degree Sonderpäda	e Didactics in Physic gogik Didactics in Physic gogik Didactics in Physic gogik Didactics in Physics	nysics (Middle School) (2015) s (Middle School) (2015) s (Primary School) (2018)
c) oral (Langua Allocat Additio Worklo 150 h Teachin § 36 N § 38 N Module First sta First sta First sta First sta First sta First sta	examin ge of a ion of p nal info ad ad ad ad ad ad ad ad ad ad ad ate exa ate exa ate exa ate exa ate exa ate exa ate exa ate exa ate exa	Examination for the teaching mination for th	each (approx. 15 minut of 2, approx. 15 minut /or English s for teaching-degree progra g degree Grundschule g degree Sonderpäda g degree Grundschule g degree Sonderpäda g degree Sonderpäda g degree Mittelschule	ammes) e Didactics in Physic gogik Didactics in Physics e Didactics in Physics gogik Didactics in Physics b Didactics in Physics gogik Didactics in Physics	nysics (Middle School) (2015) 5 (Middle School) (2015) 5 (Primary School) (2018) nysics (Middle School) (2018)
c) oral (Langua Allocat Additio Worklo 150 h Teachin § 36 N § 38 N § 38 N Module First sta First sta First sta First sta First sta First sta First sta First sta	examin ge of a ion of p nal info ad ad ad ad ad ad ad ad ad ad ate exa ate exa	e LPO I (examination regulation mination for the teaching mination for	each (approx. 15 minut of 2, approx. 15 minut /or English s for teaching-degree progra g degree Grundschule g degree Sonderpäda g degree Grundschule g degree Sonderpäda g degree Mittelschule g degree Mittelschule g degree Mittelschule g degree Grundschule	e Didactics in Physic gogik Didactics in Physic e Didactics in Physics bidactics in Physics cogik Didactics in Physics	nysics (Middle School) (2015) 5 (Middle School) (2015) 5 (Primary School) (2018) nysics (Middle School) (2018) 5 (Middle School) (2018)

Module	e title				Abbreviation
Physics 3 for Primary and Secondary General School					11-L-SP3-152-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Physics and its D	idactics	Faculty of Physics a	ind Astronomy
ECTS		od of grading	Only after succ. con		,
			Only arter succ. con		
5		rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
		ents (optics, acoustics, A ciences in Grund- and Ha		ysics) relevant to cla	asses in Natural Sciences or tech
Intende	ed leari	ning outcomes			
classes demon	s in Gru stratior	nd- and Hauptschule; kn n and pupils experiments	owledge of typical ap	proaches to the imp	scientific or technical-scientific olementation and evaluation of
		umber of weekly contact hours, l	anguage — If other than Ger	man)	
V (3) +	U (1)				
		e ssment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether
	ge of a	ation in groups (groups c ssessment: German and, places			
 Additio	nal inf	ormation			
Worklo					
	au				
150 h					
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 36 N § 38 N	-				
Module	e appea	irs in			
First sta First sta First sta First sta	ate exa ate exa ate exa ate exa	mination for the teaching mination for the teaching mination for the teaching mination for the teaching	g degree Sonderpäda g degree Mittelschule g degree Grundschule g degree Sonderpäda	gogik Didactics in Ph Didactics in Physics Didactics in Physics gogik Didactics in Ph	s (Primary School) (2018) nysics (Middle School) (2018)
First sta First sta	ate exa ate exa		g degree Grundschule g degree Sonderpäda	Didactics in Physics gogik Didactics in Ph	s (Primary School) (2020) nysics (Middle School) (2020)



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

(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".





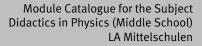
Physics (ECTS credits)

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

Modul	e title				Abbreviation	
Teaching Seminar Fundamental Principles					11-L-EL1-152-m01	
Modul	e coord	inator		Module offered by		
holder	ofthe	Chair of Physics and its [idactics	Faculty of Physics a	ind Astronomy	
ECTS	Meth	od of grading	Only after succ. con		· · · · · ·	
3	1	successfully completed		• • • •		
Duratio		Module level	Other prerequisites	i		
1 seme	ester	undergraduate				
Conter	nts)			
ception sed on	ns and specifi	nterdisciplinary aspects typical learning difficulti c contents of physics ed xperiments and suitable	es, elementarisation a ucation, verbalisatior	and didactic reconst	ruction of physical co	ontents ba-
Intend	ed lear	ning outcomes				
studen	it preco	alitative knowledge of so nceptions and special m versity and school regard	edia on relevant topi	cs; awareness of the		
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
S (2)						
a) term b) pres c) writt d) oral e) oral	s creditat paper sentatic en exar examir examir	sessment (type, scope, langua ole for bonus) (approx. 8 pages) or on (approx. 45 minutes) or mination (approx. 45 min nation of one candidate of nation in groups (groups ussessment: German and	or nutes) or each (approx. 15 minu of 2, approx. 15 minu	ites) or		
Allocat		-	<u>.</u>			
Additio	onal inf	ormation	_			
	_					
Worklo	ad					
90 h						
Teachi	ng cvcl	e				
Referre	ed to in	LPO I (examination regulation	is for teaching-degree progra	ammes)		
§ 22 § 22 § 22	Nr. 1 h) Nr. 2 f)					
Modul	e appea	ars in				
mouut		min ation for the stopphin	a dograo Crupdachul	Physics (2015)		
First st First st First st First st First st First st	ate exa ate exa ate exa ate exa ate exa	mination for the teachin mination for the teachin	g degree Grundschule g degree Realschule F g degree Gymnasium g degree Sonderpäda g degree Mittelschule	e Didactics in Physics Physics (2015) Physics (2015) gogik Didactics in Pl Physics (2015)	nysics (Middle Schoo	ol) (2015)
First st First st First st First st First st First st First st	ate exa ate exa ate exa ate exa ate exa ate exa	mination for the teachin mination for the teachin mination for the teachin mination for the teachin	g degree Grundschule g degree Realschule F g degree Gymnasium g degree Sonderpäda g degree Mittelschule g degree Mittelschule	e Didactics in Physics Physics (2015) Physics (2015) gogik Didactics in Pl Physics (2015)	nysics (Middle Schoo s (Middle School) (20	ol) (2015)

First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module title					Abbreviation	
Selected Topics in Physics Didactics					11-L-EL2-152-m01	
Module coordinator				Module offered by		
-		f examination committe	e .	Faculty of Physics a	nd Astronomy	
ECTS	1	od of grading	Only after succ. con	· · ·		
3		successfully completed				
Duratio		Module level	Other prerequisites			
	_	-				
1 seme		undergraduate				
Conter						
		in physics education.				
		ning outcomes				
		have knowledge of a cu e according to subject-s				y the acqui-
Course	es (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
S (2)						
	d of ass	sessment (type, scope, langi	Jage — if other than German.	examination offered — if no	t every semester, informati	ion on whether
		le for bonus)			,	
a) term	n paper	(approx. 8 pages) or				
		on (approx. 45 minutes)				
		mination (approx. 45 mi				
		nation of one candidate				
		ation in groups (groups ssessment: German an		les per candidate)		
	tion of					
Alloca		JIACES				
Additio	onal inf	ormation				
Worklo	pad					
90 h	_					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
-	Nr. 1 h)					
	Nr. 2 f)					
§ 22						
	e appea					
		mination for the teaching		•		
		mination for the teachin		•	5 (Primary School) (2	.015)
		mination for the teachin		• •		
		mination for the teachir mination for the teachir	,	•	nusice (Middle Scher) (2015)
		mination for the teaching	,			50 (2015)
		mination for the teachir			(Middle School) (20	015)
		mination for the teaching				<i></i>
		mination for the teaching		•	s (Primary School) (2	.018)
		mination for the teachin		•		
LA Mittale	hulan Did	actics in Physics (Middle	IMIT Mürzburg • «	enerated 18-Apr-2025 • exam	reg data re-	page 18 / 41
School) (2)		actics in Enysics (midule		ittelschulen (Didaktikfach) Pl	-	puge 10 / 41



First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module	e title				Abbreviation	
Preparatory Course Mathematics					11-P-VKM-152-m01	
Module	e coord	inator		Module offered by		
Managing Directors of the Institute of Applied Physics and Faculty of Physics and Astronomy						
-	-	f Theoretical Physics a			ind / lotionomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
2	(not)	successfully completed	t			
Duratio	on .	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts		ļ			
the intr 1. Basic 2. Coor 3. Vecto	roducti c geom rdinate ors - ve erential	on to and preparation etry and algebra systems and complex ctored values calculus	entary calculation meth for the modules of Expe numbers			specially for
Intende	ed lear	ning outcomes				
			mathematics and elem d Experimental Physics		ethods which are re	quired for
Course	S (type, r	number of weekly contact hou	rs, language — if other than Ger	rman)		
T (2)						
		sessment (type, scope, lan Ile for bonus)	guage — if other than German,	examination offered — if no	t every semester, informa	tion on whether
b) talk	(appro	successful completion x. 15 minutes) ffered: Once a year, wi	of approx. 50% of appronent of approx. 50% of approx.	ox. 6 exercise sheets	i) or	
Allocat	ion of _l	olaces				
	-					
Additio	onal inf	ormation				
Worklo	ad					
60 h						
Teachi	ng cycl	e				
	-					
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	immes)		
§ 22 § 22 § 22	Nr. 1 h) Nr. 2 f)					
Module	e appea	ars in				
Bachel	or's de	gree (1 major) Physics	(2015)			
			ucture Technology (201	5)		
		gree (1 major) Mathem				
		gree (1 major, 1 minor)	-			
			ing degree Grundschule			
	ate exa					`
			ing degree Grundschule	•	s (Primary School) (:	2015)
First sta	ate exa		ing degree Realschule F	•	-	2015)

First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) Bachelor's degree (1 major) Mathematical Physics (2016)

First state examination for the teaching degree Grundschule Physics (2018)

First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018)

First state examination for the teaching degree Realschule Physics (2018)

First state examination for the teaching degree Gymnasium Physics (2018)

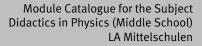
First state examination for the teaching degree Mittelschule Physics (2018)

First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018)

Module title Abbreviation						
					11-L-L3B-152-m01	
Module coordinator				Module offered by		
holder	of the (Chair of Physics and its I	Didactics	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				
Conten						
The mo	dule p	rovides an introduction g-learning-laboratory.	to successful supervis	ion of pupils indepe	ndently carrying out	experiments
Intende	ed lear	ning outcomes				
vel of p experin ly and o ve beha terns b	erform nenting criticall aviour J y repea	earn to classify differen ance, to support the pu g (supervision competer y evaluate their own act patterns and to support tedly working on the sa etencies).	pils according to their icies in open classroo ions. A lecturer gives the students' strength	needs and age and t m situations). The st ndividual feedback is. The students deve	to help them during i udents are able to m to the students to av elop professional be	independent ethodical- oid negati- haviour pat-
Course	S (type, r	umber of weekly contact hours,	language — if other than Gei	man)		
P (2)						
Method	d of ass	essment (type, scope, langu	age — if other than German,	examination offered — if no	t every semester, informati	on on whether
		le for bonus)				
b) oral c) oral	examir examin	mination (approx. 45 mi ation of one candidate ation in groups (groups (approx. 8 pages)	each (approx. 10 minu			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
This mo	odule is	s designed for students		subject in the natura	l sciences.	
Worklo	ad					
60 h						
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulatio	ns for teaching-degree progra	mmes)		
§ 22 § 22 § 22	Nr. 1 h) Nr. 2 f)		- 101 (cduining degree progre			
Module	e appea	ins in				
First state examination for the teaching degree Grundschule Physics (2015) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015) First state examination for the teaching degree Realschule Physics (2015) First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) LA Mittelschulen Didactics in Physics (Middle Mittelschule Didactics in Physics (Middle School) (2015)						
School) (20				ittelschulen (Didaktikfach) Ph	*	

First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module title					Abbreviation	
Low Cost - High Impact. Low-budget Experiments for Science Courses (Phy-						01
sics)						
Module	Module coordinator M					
holder	of the C	Chair of Physics and its [Didactics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
2		successfully completed		•		
Duratio	r	Module level	Other prerequisites			
1 semes		undergraduate				
Conten		undergraduate]			
					· · · · · ·	
		nd realisation of experim and secondary level I.	ental stations with or	ainary and inexpens	ive consumables for	classes of
		ning outcomes	_			
		develop simple scientific	ovnovimonting statio	no to use for the tree	acition from primon.	ta cacanda
ry level	l for sn	nall groups from differer ant to the curriculum in	it types of schools. In	doing so, they learn	,	
Course	S (type, n	umber of weekly contact hours,	- language — if other than Ger	man)		
S (2)	.,,,,					
	l of acc	essment (type, scope, langu	- if other than Corman of	wamination offered if no	t ovoru comostor informati	on on whothor
		le for bonus)	age — II other than German, e	xammation onered — ii no	it every semester, monnati	on on whether
		nination (approx. 45 min				
		ation of one candidate		-		
		ation in groups (groups (approx. 8 pages)	of 2, approx. 20 minu	tes) or		
Allocati						
Additio	nal info	ormation				
This mo	odule is	designed for students	studving at least one s	subiect in the natura	l sciences.	
Worklo			, , ,	,		
60 h						
Teachir		h				
Teacini	ig cycu	5				
 Deferme	d 4 a 1 m					
		LPO I (examination regulation	is for teaching-degree progra	mmes)		
§ 22 N § 22 N						
§ 22						
Module		rs in				
		mination for the teachin	g degree Grundschule	Physics (2015)		
		mination for the teachin		• •	s (Primary School) (2	015)
		mination for the teachin		•	, (
		mination for the teachin		•		
		mination for the teachin	,	• -	nysics (Middle Schoo	ol) (2015)
First sta	ate exa	mination for the teachin	g degree Mittelschule	Physics (2015)		
First sta	ate exa	mination for the teachin	g degree Mittelschule	Didactics in Physics	(Middle School) (20	o15)
First sta	ate exa	mination for the teachin	g degree Grundschule	Physics (2018)		
First sta	ate exa	mination for the teachin	g degree Grundschule	Didactics in Physics	s (Primary School) (2	018)
First sta	ate exa	mination for the teachin	g degree Realschule P	hysics (2018)		
LA Mittelscł School) (20		actics in Physics (Middle		nerated 18-Apr-2025 • exam ttelschulen (Didaktikfach) Pr	-	page 24 / 41



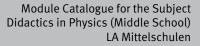
First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module	title				Abbreviation	
Teachin	ng Scie	nce with Hands-on-Exhi	bits (Physics)		11-MIND-Ph2-152-m	01
Module	coord	inator		Module offered by	<u> </u>	
holder of the Chair of Physics and its Didactics			Vidactics	Faculty of Physics a	and Astronomy	
			• · · · · · · · · · · · · · · · · · · ·	ind Astronomy		
ECTS			Only after succ. com			
2		successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Designi	ng and	l creating hands-on exhi	bits for STEM subjects	5.		
Intende	ed leari	ning outcomes				
tents in	and o	evaluate the advantages ut of school. They plan a vork with pupils of secor	nd implement an inte			
Courses	5 (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
S (2)						
		s essment (type, scope, langua le for bonus)	age — if other than German, e	examination offered — if no	ot every semester, informati	on on whether
b) oral e c) oral e	examin examin	nination (approx. 45 mir ation of one candidate e ation in groups (groups (approx. 8 pages)	each (approx. 10 minu			
Allocati			-			
AllULal		Jaces				
		ormation				
This mo	dule is	s designed for students s	studying at least one s	subject in the natura	l sciences.	
Worklo	ad					
60 h						
Teachin	ng cycl	е				
Referre	d to in	IPOI (examination regulation	s for teaching degree progra	mmec)		
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 1 h) § 22 II Nr. 2 f) § 22 II Nr. 3 f)						
Module	appea	in and a second s				
First state examination for the teaching degree Grundschule Physics (2015) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015) First state examination for the teaching degree Realschule Physics (2015) First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Grundschule Physics (2018)						
A Mittelschulen Didactics in Physics (Middle JMU Würzburg • generated 18-Apr-2025 • exam. reg. data re- page 26 / 41 School) (2015) cord Lehramt Mittelschulen (Didaktikfach) Physik - 2015 page 26 / 41						

First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module title				Abbreviation		
Astroph	nysics				11-AP-152-m01	
Module	coord	inator		Module offered by		
Managing Director of the Institute of The and Astrophysics			Theoretical Physics	Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
History of astronomy, coordinates and time measurement, the Solar System, exoplanets, astronomical scales, telescopes and detectors, stellar structure and atmospheres, stellar evolution and end stages, interstellar medi- um, molecular clouds, structure of the milky way, the local universe, the expanding universe, galaxies, active ga- lactic nuclei, large-scale structures, cosmology.						
Intende	d lear	ning outcomes				
physica	l obse	are familiar with the mo rvations and evaluation familiar with the physic	ns. They are able to use	e these methods to p	lan and analyse owr	n observati-
Courses	5 (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)		
V (2) + I Module		t in: German or English				
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
b) oral e c) oral e d) proje e) prese If a writ stead ta of asses nation o Langua	 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 					
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
180 h						
Teaching cycle						
		LPO I (examination regulati	ons for teaching-degree progra	mmes)		
§ 22 Nr. 1 h) § 22 Nr. 2 f)						
§ 22 II Nr. 3 f) Module appears in						
LA Mittelsch School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam ittelschulen (Didaktikfach) Pr	-	page 28 / 41

UNIVERSITÄT WÜRZBURG



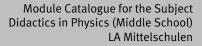
Bachelor's degree (1 major) Physics (2015) Bachelor's degree (1 major) Mathematical Physics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2015) First state examination for the teaching degree Grundschule Physics (2015) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015) First state examination for the teaching degree Realschule Physics (2015) First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) Bachelor's degree (1 major) Mathematical Physics (2016) Master's degree (1 major) Nanostructure Technology (2016) Bachelor's degree (1 major) Aerospace Computer Science (2017) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) Master's degree (1 major) Nanostructure Technology (2020) Bachelor's degree (1 major) Physics (2020) Bachelor's degree (1 major) Mathematical Physics (2020) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2020) Bachelor's degree (1 major) Aerospace Computer Science (2020) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Physics (2020) Master's degree (1 major) Quantum Technology (2021) exchange program Physics (2023) Bachelor's degree (1 major) Mathematical Physics (2024)

Module title				Abbreviation				
Princip	les of E	nergy Technologies			11-ENT-152-m01			
Module	e coord	inator		Module offered by				
Managi	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy			
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)				
6	nume	rical grade						
Duratio	n	Module level	Other prerequisites	;				
1 semester graduate								
Conten	ts							
Physical principles of energy conservation and energy conversion, energy transport and energy storage as well as renewable resources of energy. We also discuss aspects of optimising materials (e.g. nanostructured insula- ting materials, selective layers, highly activated carbons). The course is especially suitable for teaching degree students. Energy conservation via thermal insulation. Thermodynamic energy efficiency. Fossil fired energy con- verters. Nuclear power plants. Hydroelectricity. Wind turbines. Photovoltaics. Solar thermal: Heat. Solar thermal: Electricity. Biomass. Geothermal energy. Energy storage. Energy transport								
Intende	ed lear	ning outcomes						
		know the principles of a ge. They understand th						
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)				
V (3) + I Module		t in: German or English						
		sessment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether		
		le for bonus)						
b) oral e c) oral e d) proje e) prese If a writ stead ta of asse nation Langua Assess	 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, winter semester 							
Allocat	ion of p	olaces						
Additio	nal inf	ormation						
 Worklo	ad							
180 h								
Teaching cycle								
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)				
§ 22 Nr. 1 h) § 22 Nr. 2 f) § 22 Nr. 3 f)								
Module	e appea	ars in						
LA Mittelscl School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam littelschulen (Didaktikfach) Pł	-	page 30 / 41		

UNIVERSITÄT WÜRZBURG

Bachelor's degree (1 major) Physics (2015) Bachelor's degree (1 major) Nanostructure Technology (2015) First state examination for the teaching degree Grundschule Physics (2015) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015) First state examination for the teaching degree Realschule Physics (2015) First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) Master's degree (1 major) Functional Materials (2016) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) Bachelor's degree (1 major) Physics (2020) Bachelor's degree (1 major) Nanostructure Technology (2020) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Physics (2020) Bachelor's degree (1 major) Quantum Technology (2021) Master's degree (1 major) Functional Materials (2022) exchange program Physics (2023) Master's degree (1 major) Functional Materials (2025)

Module title Abbreviation						
Current Topics of Teaching Concepts in Physics					11-L-APD-152-m01	
Module	e coord	inator		Module offered by	<u> </u>	
chairpe	erson o	f examination committe	e	Faculty of Physics a	and Astronomy	
ECTS Method of grading Only after succ. co					,	
		rical grade				
3 Duratio		Module level	Other prerequisites			
1 seme		undergraduate				
Conten	Its					
Current topics in physics education.						
		ning outcomes				
		-	want auch die sin line of .		ad awa abla ta alaasii	
		nave knowledge of a cu e according to subject-s				ry the acqui-
Course	S (type, r	umber of weekly contact hours	, language — if other than Ger	rman)		
S (2)						
	e taugh	t in: German or English				
Metho	d of ass	essment (type, scope, langu	lage — if other than German, o	examination offered — if no	ot every semester, informat	ion on whether
module is	s creditab	le for bonus)				
		nination (approx. 45 mi				
		ation of one candidate		-		
		ation in groups (groups	of 2, approx. 10 minut	tes per candidate) o	r	
		(approx. 8 pages) or	- !			
		5 minutes) with discus	sion			
Allocat	tion of p	olaces				
	nal inf	ormation				
Additio	onal inf	ormation				
Worklo	ad					
90 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)		
§ 22						
§ 22						
§ 22						
Module						
		mination for the teachir		-	·	
		mination for the teachir		•	s (Primary School) (2	2015)
First state examination for the teaching degree Realschule Physics (2015)						
First state examination for the teaching degree Gymnasium Physics (2015)						
First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015)						
First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015)						
				-	(ivilaale School) (20	015)
First state examination for the teaching degree Grundschule Physics (2018)						
First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018)						
This state examination for the leaching degree redistingle rhysics (2018)						
		actics in Physics (Middle		enerated 18-Apr-2025 • exam	-	page 32 / 41
School) (20	015)		cord Lehramt M	ittelschulen (Didaktikfach) Pl	1ysık - 2015	



First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module title				Abbreviation		
Scienti	ific Wor	k in Teaching Concepts			11-L-WPD-152-m01	
Module	e coord	inator		Module offered by		
Managing Director of the Institute of Applied Physics			pplied Physics	Faculty of Physics a	nd Astronomy	
			Only after succ. con			
		successfully completed				
3						
Duratio		Module level	Other prerequisites			
1 seme	1 semester undergraduate					
Contents						
Current	t topics	in scientific work in phy	vsics education			
Intend	ed lear	ning outcomes				
		have knowledge of a cur ucation on the basis of s		physics education ar	nd are able to proces	s questions
		number of weekly contact hours,		rman)		
	5 (type, 1	iumber of weekly contact hours,	Tanguage — If other than Ger	illidi)		
S (2)	a taugh	t in: German or English				
		sessment (type, scope, langu Ile for bonus)	age — if other than German,	examination offered — if no	t every semester, informati	on on whether
		minutes)				
Allocat	ion of p	olaces				
			_			
Additio	onal inf	ormation				
Worklo	ad					
90 h						
-	ng cycl	e				
	3 -)					
Deferre						
	-	LPO I (examination regulation	ns for teaching-degree progra	immes)		
§ 22 § 22	Nr. 1 h) Nr. 2 f)					
§ 22 § 22						
_	e appea	ars in				
		mination for the teachin	a dogroo Grundschuld	Physics (2015)		
		mination for the teachin			(Primary School) (2	015)
		mination for the teachin				015)
		mination for the teachin				
		mination for the teachin			nysics (Middle Schoo	ol) (2015)
First st	ate exa	mination for the teachin	g degree Mittelschule	Physics (2015)		
First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015)						
		mination for the teachin		-		
		mination for the teachin		•	s (Primary School) (2	018)
		mination for the teachin		•		
		mination for the teachin		-		
		mination for the teachin		-	weice (Middle Cake	(2040)
		mination for the teachin mination for the teachin				
				-		(01)
LA Mittelsc School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam ittelschulen (Didaktikfach) Pr		page 34 / 41

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Physics (2020)

Module title				Abbreviation			
Current Topics in Physics				11-LX6-152-m01			
Module	e coord	inator		Module offered by	Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
6		rical grade		· · · · ·			
Duratio		Module level	Other prerequisites				
1 seme	ster	undergraduate		ination committee re	equired.		
	Contents						
Current topics in physics.							
		ning outcomes					
		have knowledge of a cu		Dhusics and underst	and the measuring a	nd/or colou	
lation r	nethod	s necessary to acquire lication areas.					
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	man)			
V (3) +	R (1)						
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
d) proje e) prese If a writ stead ta of asse nation Langua Allocat	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 in- stead 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 exami- nation date at the latest. Language of assessment: German and/or English Allocation of places Additional information						
Worklo	ad						
180 h							
Teachi		•					
	is cyci						
Deferre	d to in			`			
Referred to in LPO I (examination regulations for teaching-degree programmes) § 22 II Nr. 1 h) § 22 II Nr. 2 f) § 22 II Nr. 3 f)							
Module appears in							
First state examination for the teaching degree Grundschule Physics (2015) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015) First state examination for the teaching degree Realschule Physics (2015) First state examination for the teaching degree Gymnasium Physics (2015) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015)							
LA Mittelsc School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam ittelschulen (Didaktikfach) Pł	-	page 36 / 41	



First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Mittelschule Physics (2020) First state examination for the teaching degree Mittelschule Physics (2020) First state examination for the teaching degree Mittelschule Physics (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)

Module title					Abbreviation	
Selecte	d Topi	cs of Physics			11-LCS6-152-m01	
Module coordinator			Module offered by			
chairpe	rson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
4	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	Approval from exam	ination committee re	equired.	
Contents						
Current topics in experimental physics. Credited academic achievements, e.g. in case of change of university or study abroad.						
Intende	ed lear	ning outcomes				
sics of t underst	the Bao tand th	have advanced compete chelor's programme. Th e measuring and/or events bject-specific contexts	ey have knowledge of aluation methods nece	a current subdiscipli ssary to acquire this	ne of Experimental I	Physics and
Courses	S (type, r	number of weekly contact hours	, language — if other than Gei	man)		
V (2) +	R (1)					
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
d) proje e) prese If a writ stead ta of asse nation o	ect repo entatio ten exa ake the ssmen date at	ation in groups (groups ort (approx. 8 to 10 page n/talk (approx. 30 minu amination was chosen a e form of an oral examin t is changed, the lecture the latest. ssessment: German an	es) or utes) as method of assessmo ation of one candidate er must inform student	ent, this may be char e each or an oral exa	nged and assessme mination in groups.	If the method
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
120 h						
Teachir	ıg cycl	e				
		LPO I (examination regulation	ons for teaching-degree progra	mmes)		
§ 22 II Nr. 1 h) § 22 II Nr. 2 f) § 22 II Nr. 3 f)						
Module appears inFirst state examination for the teaching degree Grundschule Physics (2015)First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2015)First state examination for the teaching degree Realschule Physics (2015)First state examination for the teaching degree Gymnasium Physics (2015)						
LA Mittelscł School) (20		actics in Physics (Middle		enerated 18-Apr-2025 • exam ittelschulen (Didaktikfach) Pł	•	page 38 / 41



First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Physics (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Grundschule Physics (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2018) First state examination for the teaching degree Realschule Physics (2018) First state examination for the teaching degree Gymnasium Physics (2018) First state examination for the teaching degree Mittelschule Physics (2018) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Grundschule Didactics in Physics (Primary School) (2020) First state examination for the teaching degree Grundschule Physics (2020) First state examination for the teaching degree Gymnasium Physics (2020) First state examination for the teaching degree Realschule Physics (2020) First state examination for the teaching degree Sonderpädagogik Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020) First state examination for the teaching degree Mittelschule Physics (2020)





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 Mittelschule may write this thesis in the subject Didaktik einer Fächergruppe der Mittelschule (Didactics of a Group of Subjects of Mittelschule), 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.

Module title A					Abbreviation
Thesis	in Phys	sics Secondary General S	ichool		11-L-HA-MS-DF-152-m01
Module coordinator Module offere			Module offered by		
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1-2 sen	nester	undergraduate			
Conten	Its				
Indepe	ndent p	processing of a topic of P	hysics and/or Didact	ics of Physics, chose	en in consultation with a lecturer.
Intend	ed leari	ning outcomes			
and me due co	ethods nsidera	acquired in the teaching tion of didactic aspects.	degree programme.	They are able to pres	while applying the knowledge sent their results in written form in
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Gei	rman)	
No cou	rses as	signed to module			
		s essment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
prox. 4 Langua	o page: age of a	s)	-	-	eaching-degree programmes) (ap- on 4 LPO I (examination regulati-
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	immes)	
§ 29					
-	e appea	irs in			
First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2015) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2018) First state examination for the teaching degree Mittelschule Didactics in Physics (Middle School) (2020)					