Bachelor programme Biological Sciences

List of courses offered in English if international students are enrolled

The duration of each course is 6 weeks, either in the 1st or 2nd half of the semester.

Summer semester (middle of April until middle of July)

- BSc-Biow-12A Plant Ecology, 1st half of semester (starting in 2023), 6 ECTS credits
- BSc-Biow-12B Animal Physiology, 1st half of semester, 6 ECTS credits
- BSc-Biow-13B Neurobiology I, 2nd half of semester, 6 ECTS credits
- BSc-Biow-13C Molecular Plant Physiology, 2nd half of semester, 6 ECTS credits

Winter semester (middle of October until middle of February of the following year)

- BSc-Biow-14B Cell Biology, 1st half of semester, 6 ECTS credits
- BSc-Biow-15A Evolutionary Biology and Diversity of Animals, 2nd half of semester, 6 ECTS credits
- BSc-Biow-15B Neurobiology II, 2nd half of semester, 6 ECTS credits

Course descriptions

Course descriptions

BSc-Biow-12A - **Plant Ecology**, 1st half of semester, starting in 2023, 6 ECTS credits

				60	CP (total) =	= 180 h						
BSc-Biow- 12A	Plant Ecology		Elective module	Co 4 S	ontact stud SWS / 60 h	у	Self-study 120 h		4 \$	SWS		
Contents	•											
The pract	ical course teaches basic methods of	plant ecologi	cal research u	using select	ed native ed	cosyster	ns as exa	mples. T	his pract	tical		
approach	approach serves to deepen the theoretical knowledge acqui				gy". In addi	tion, ch	aracterist	tic specie	s of the			
respective	e ecosystems as well as important inc	licator species	es for certain site characteristics are to be learned. Knowledge about the effects									
Educational	Directives / Competences		n de imparieu.									
Students	will master key ecological study met	hods and be fa	amiliar with t	he most im	portant nat	ive ecos	vstems i	n terms o	f area. T	hev will		
recognize	selected ecologically significant spe	cies (characte	er species of e	ecosystems.	, indicator s	species f	or specif	ic site ch	aracteris	stics).		
They will	They will understand the effect of abiotic factors on plant occurrence and performance.									,		
Requirements	s for Participation			*								
Requireme	nt for participation is the successful of	completion of	the modules	BSc-Biow-	1 (Structur	e and Fu	inction o	of Organis	sms), BS	c-Biow-		
6a and BSc	-Biow-6b (Diversity of Organisms) a	and BSc-Biow	v-9 (Ecology	and Evolut	ionary Biol	logy). Ez	ception	s for stud	ents on c	courses		
other than l	BSc Biosciences require approval on	a case-by-cas	e basis by the	e module le	ader prior t	to alloca	tion of p	laces.				
Recommende	a Requirements	11 (Dlant Dh		Mianahial) A							
Successiu	completion of the module BSC-Blow	-11 (Plant Ph	ysiology and	Microbiolo	ogy).							
In the case	of field work travel costs may be in	ourred by the	internshin na	rticinante s	Since part o	f the int	ernshin 1	vill be co	nducted	in the		
field, partic	cipants are advised to get immunized	against TBE	in time by va	ccination.	since part o	i the fift	cinsinp v		nuucteu	in the		
Dates and Mo	odule Frequency	Ŭ	Once a year in the summer semester.									
Duration			1/2 semester									
Module respo	nsible		Prof. Dr. J.F. Niek Scheepens									
Proof of Stud	у											
Proof of	participation		Active participation in the practical course									
Course A	Assessment		Protocols									
Forms of Tea	ching		Practical course, seminar									
Module Comple	etion Test		none									
Module C	ompletion Test consists of:											
		LV-Form	rm SWS CP Semester									
					1	2	3	4	5	6		
Plant Eco	ology	Р	3	5				Х				
Plant Eco	ology	S	1	1				Х				
Module e	xamination											
Sum			4	6								

BSc-Biow-12B - Animal Physiology, 1st half of semester, 6 ECTS credits

			6	5 CP (total) =	= 180 h							
BSc-Biow- 12B	Animal Physiology		Elective module	C 4	Contact stud 4 SWS / 60 h	l y	Self-st 120 h	tudy	4 \$	SWS		
Contents	•											
The pract energy ba	ical course provides insights into exp lance, excretion, blood, circulation, p	perimental inv respiration, m	estigation me usculature and	thods for d nutritio	r comparativ on)	e physio	logy in ł	iumans and	l anima	ls (e.g.		
Educational (Objectives / Competences											
Students	will master important physiological i	e laborato	ory. They are	able to	evaluate	evolutiona	ary adaj	ptation				
strategies and their individual development and know the importance of abiotic factors on reaction mechanisms and their selective e									/e effect			
on compe	tition.											
Requirements	s for Participation											
Requireme 6a and BSc	nt for participation is the successful of Biow-6b (Diversity of Organisms) a	completion of and BSc-Biow	the modules v-7 (Biochemi	BSc-Biov	w-1 (Structur Animal Phy	re and Fu siology).	inction of	of Organisı	ns), BS	c-Biow-		
Recommende	d Requirements											
Special notes												
Dates and Mo	dule Frequency		Once a year in the summer semester.									
Duration			1/2 semester									
Module respo	nsible		Prof. Dr. Sv	ven Klimp	pel							
Proof of Stud	У											
Proof of	participation		Active participation in the practical course									
Course A	Assessment		Protocols									
Forms of Tea	ching		Practical course, seminar									
Module Comple	etion Test		none									
Module C	ompletion Test consists of:											
		LV-Form	SWS	CP		Semester						
					1	2	3	4	5	6		
Animal Pl	nysiology	Р	3	5				Х				
Animal P	nysiology	S	1	1				Х				
Module e	xamination											
Sum			4	6								

BSc-Biow-13B - Neurobiology I, 2nd half of semester, 6 ECTS credits

				6	CP (total)	= 180 h						
BSc-Biow- 13B	Neurobiology		Elective module		Contact stud SWS / 60 h	ly I	Self-study 120 h		4	SWS		
Contents												
Teaching	and learning of basic methods of neu	robiology, in	cluding histol	logical ex	aminations	of nervo	us tissue	and of ser	sory o	rgans,		
basic elec	trophysiological experimental setups	, psychophys	visical approaches to examination, simulation of neuronal activity.									
Educational C)bjectives / Competences											
Students	will learn basic neurobiological work	ing methods	to understand	experime	ental approa	ches in r	eurobio	logy and to	prepa	te for an		
appropriate bachelor thesis.												
Requirements	for Participation											
Requirement	nt for participation is the successful c	ompletion of	the modules	BSc-Biow	w-1 (Structu	re and Fu	unction of	of Organisr	ns), BS	Sc-Biow-		
6a and BSc	-Biow-6b (Diversity of Organisms) a	nd BSc-Biow	v-10 (Neurobi	ology, Ce	ell and Deve	lopment	al Biolo	gy).				
Recommende	d Requirements											
Special notes												
Dates and Mo	dule Frequency		Once a year in the summer semester.									
Duration			1/2 semeste	r								
Module respo	nsible		Prof. Dr. Be	ernd Grün	newald, PD	Dr. Bern	hard Ga	ese				
Proof of Study	9											
Proof of	participation		Active participation in the practical course									
Course A	ssessment		Protocols									
Forms of Tea	ching		Practical course, seminar									
Module Comple	tion Test		none									
Module C	ompletion Test consists of:	* * * *	awa	CD			~					
		LV-Form	SWS	СР	Semester							
					1	2	3	4	5	6		
Neurobio	logy I	Р	3	5				Х		1		
Neurobio	logy I	S	1	1				Х		1		
Module e	xamination									1		
Sum			4	6						1		

BSc-Biow-13C - Molecular Plant Physiology, 2nd half of semester6 ECTS credits

					6	CP (total)	= 180 h						
BS 130	c-Biow- C	Molecular Plant Physiology		Elective module	C 4	Contact stud SWS / 60 h	ly I	Self-st 120 h	tudy	4	SWS		
Co	ntents			•									
	Teaching biochemis	and learning of basic methods in mo stry and methods to examine metabo	lecular plant plant	physiology ar	d develo	pmental phy	siology,	includin	g basic m	ethods	of plant		
Ed	ucational C	bjectives / Competences											
	Students po the ability to for a corres	ssess practical skills in basic laborat o quantitatively analyse and to critic ponding bachelor thesis.	ory technique ally evaluate	es in plant phy experimental	siology, l data. The	biochemistry ey are trained	y and bio 1 in expe	physics. rimental	In additic concepts	on, stud as a pre	ents have erequisite		
Re	quirements	for Participation											
	Prerequisite for participation is the successful completion of the modules BSc-Biow-1 (Structure and Function of Organisms), BSc-Biow 6a and BSc-Biow-6b (Diversity of Organisms) and the successful completion of the module BSc-Biow-11 (Plant Physiology and Microbiology).								c- Biow-				
Re	commendee	d Requirements											
	Successful of for Natural	completion of modules BSc-Biow-2a Scientists and Teachers L2") and BS	a and -2b (Ge Sc-Biow-5 (St	neral and Inor atistics).	rganic Ch	nemistry), B	Sc-Biow-	-3a and -	3b ("Orga	nic Ch	emistry		
Spe	ecial notes												
-													
Da	tes and Mo	dule Frequency		Once a year in the summer semester.									
Du	ration			1/2 semester									
Mo	dule respon	nsible		Prof. Dr. C	Prof. Dr. Claudia Büchel								
Pre	pof of Study	/											
	Proof of j	participation		Active participation in the practical course									
-	Course A	ssessment		Protocols									
For	rms of Teac	ching		Practical course, seminar									
Mod	ule Comple	tion Test		none									
Module Completion Test consists of:				CWC	CD			Sam	aatan				
			LV-FOIII	5W5	CP	1	2	2		5	6		
						1	2	3	4	3	0		
	Molecular	Plant Physiology	Р	3	5				Х				
	Molecular	Plant Physiology	S	1	1				Х				
	Module ex	xamination											
	Sum			4	6								

BSc-Biow-14B - Cell Biology, 1st half of semester, 6 ECTS credits

				6	CP (total) =	= 180 h						
BSc-Biow- 14B	Cell Biology		Elective module		ontact stud SWS / 60 h	y Self-study 120 h		udy	4 \$	SWS		
Contents												
In the pra- function of reporter of transport	ctical course, typical cell and develop of eukaryotic cells in its normal and d onstructs, induction of apoptosis in c of receptors linked to Alzheimer's dia	omental biolo lisease state. ell culture, ch sease using C	logy experiments are carried out to better understand the organization and . This includes, for example, the transformation of plant cells with fluorescen challenging early development in zebrafish embryo, investigating cellular <i>C. elegans</i> mutant lines.									
Educational C	bjectives / Competences											
The stude	nts will identify and analyze differen	t cell types, t	issues and org	gans, as we	ell as the in	ternal org	ganizatio	on of cells	s in diffe	rent		
eukaryoti	e model systems. They will better une	derstand how	cells function	n in a mult	ticellular or	ganism, [•]	with a fo	cus on si	gnal			
transducti	on, cell identity, cell death, and intra	cellular trans	port. The part	icipants w	vill learn to	handle d	ifferent 1	nulticellu	ılar mod	el		
systems a	s well as to apply various staining an	d fluorescenc	e microscopy	technique	es.							
Requirements	for Participation	1.0	6.1 1.1	DG D'	1 (6)	1 5		60				
BSc-Biow-	6a and BSc-Biow-6b (Diversity of C	ompletion of Organisms) an	d BSc-Biow-	BSC-Blow 10 (Neuro	v-1 (Structu biology, Ce	ell and P	unction o evelopm	ental Bio	sms), logy).			
Recommende	l Requirements											
Successful	completion of the module BSc-Biow	-7 (Biochem	istry and Ani	nal Physic	ology).							
Special notes												
Dates and Mo	dule Frequency		Once a year in the winter semester.									
Duration			1/2 semester									
Module respo	nsible		Prof. Dr. Virginie Lecaudey									
Proof of Study	7											
Proof of p	participation		Active participation in the practical course									
Course A	ssessment		Protocols									
Forms of Teac	ching		Practical course, seminar									
Module Comple	tion Test		none									
Module Co	ompletion Test consists of:	LUE	CWC	CD			C					
		LV-Form	242	CP	CP Semester				6			
					1	2	3	4	3	0		
Cell biolo	ду	Р	3	5					Х			
Cell biolo	ду	S	1	1					Х			
Module e	xamination											
Sum			4	6								

BSc-Biow-15A - Evolutionary Biology and Diversity of Animals, 2nd half of semester, 6 ECTS credits

					6 (6 CP (total) = 180 h								
BSc-B 15A	iow-	Evolutionary Biology and Divers Animals	sity of	Elective module		ontact stud SWS / 60 F	ly 1	Self-st 120 h	study h		4 SWS			
Conte	nts													
In ha bu gr st pr w	n this mo and, this ut also pr raphical i imulated redomina hereby th	dule different contents of evolutiona is done through laboratory practical ractical components to be carried ou implementations are also trained. The l in discussion or seminar rounds to antly from the research areas of the p he students at the same time gain an	d biodiversit sibly also in t ly. On the oth ceive basic th content of the ecturers (vert heir respectiv	y of animal he field), w her hand, ex eoretical in e material. T ebrates, inv e research	l organisma which inclu xercises, st troduction The conter vertebrates field and th	s are pres de a dem atistical o s to the r at and the , data set he projec	sented ex onstration calculation espective model of s from re- t-specifi	templarily. on and explored and dra e topic of to organisms of esearch pro c analysis a	On the anation wing- he day come jects, c approace	e one n part, and are others), ches.				
Educa	tional O	bjectives / Competences												
T bo ev of	The students are able to realistically assess the biological diversity in the animal kingdom, how it is represented within species and between species. They will be able to independently formulate (within the context of the examples covered) approaches to analysis in evolutionary biology and evaluate results. They will be familiar with selected laboratory and computational techniques used for analyse of evolutionary and behavioral biology, evolutionary ecology and phylogeny, and biodiversity, communities, and populations									nd sis in analyses				
Rec 6a a	Requirements for participation is the successful completion of the modules BSc-Biow-1 (Structure and Function of Organisms), BSc-Biow- 6a and BSc-Biow-6b (Diversity of Organisms) and BSc-Biow-9 (Ecology and Evolutionary Biology)									c-Biow-				
Recon	ımended	1 Requirements												
Specia	l notes													
For field	some of t d work, m rmediate s	he module days, appropriate dissecting ec inor travel costs may be incurred (no ove semester.	quipment should rnight stays). Fo	d be kept on ha	nd. Some of al reasons, th	the content ne module m	involves w ay be offe	vork and a ered as a b	analysis on F block course	Cs. In c in the	ase of			
Dates	and Mo	dule Frequency		Once a year in the winter semester.										
Durati	ion			1/2 semester, if necessary as a compact module in the intermediate semester										
Modu	le respoi	nsible		Prof. Dr. Henner Hollert										
Proof	of Study	7												
Р	roof of p	participation		Active participation in the practical course										
C	Course A	ssessment		Protocols										
Forms	of Teac	hing		Practical course, exercises, seminar										
Module	Comple	tion Test		none										
Me	odule Co	ompletion Test consists of:	1											
			LV-Form	SWS	СР	1	2	Sem 3	ester 4	5	6			
Ev	olution a	nd Diversity of Animals	Р	3	5	_				v				
Eve				5						Λ				
Evolution and Diversity of Animals S				1	1					л Х				
N	olution a lodule ex	nd Diversity of Animals nd Diversity of Animals xamination	S	1	1					X				

BSc-Biow-15B - Neurobiology II, 2nd half of semester, 6 ECTS credits

			6	6 CP (total) = 180 h								
BSc-Biow- 15B	Neurobiology II		Elective module	C 4	ontact stud SWS / 60 h	studySelf-stud60 h120 h		tudy	4	4 SWS		
Contents												
Basic me	thods of neurobiology are applied pr	ractically. The	main focus is	s on cellula	ar and mole	cular ne	urobiolo	gy.				
Educational (Objectives / Competences											
The stude	ents acquire an overview of the mole	cular function	s of nerve cel	lls and thei	ir interactio	ns by us	ing cell l	biological	and mo	lecular		
biologica	l examination techniques including	neurons in cult	ture, 2D and 3	3D analysi	s of mouse	brain.						
Requirements	s for Participation											
Requireme	nt for participation is the successful	completion of	the modules	BSc-Biow	-1 (Structu	re and F	unction o	of Organis	sms), BS	Sc-Biow-		
6a and BSc	-Biow-6b (Diversity of Organisms)	and BSc-Biow	v-10 (Neurob	iology, Ce	ll and Deve	elopment	al Biolo	gy).				
Recommende	d Requirements											
Special notes												
Dates and Mo	dule Frequency		Once a year in the winter semester.									
Duration			1/2 semeste	er								
Module respo	nsible		Prof. Dr. A	mparo Ac	ker-Palmer							
Proof of Stud	y 											
Proof of	participation		Acuve participation in the practical course									
Course A	Assessment		Protocols									
Forms of Tea	cning		Practical course, seminar									
Module Comple	etion Test		none									
Wiodule C	ompletion Test consists of.	LV Form	SWS	CP			San	actor				
		L v -Pom	5465	CI	1	2	3		5	6		
					1	2	5	-	5	0		
Neurobiolo	gy II	Р	3	5					X			
Neurobiolo	gy II	S	1	1					Х			
Module e	xamination											
Sum			4	6			1					