Compulsory modules:

INS IN	Einführung in die	Compulsory	13 CP = 390 h		10 SWI
Introduction to Neuroscience	Neurowissenschaften	module	Contact study 10 SWH / 150 h	Self study 240 h	- SWE
Content		I			
Content: Cellular Mechanisms of sig function, basis of of the human brain Series of lectures The lectures go in including non-inva psychology as we Seminars relating The students will Introductory sess Introducing neuro Colloquium Participating in 7 Weekend semina Presenting and dis	on selected topics in neu to more detail about speci asive analyses of the huma ll as methodological devel g to the lectures in select assess research papers rele sions biology research in Frank neurobiology oriented col	tical background to t ty, learning, memory f the nervous system trosciences II (SS) fic aspects of experi- an brain, degenerative lopments, e.g. optog ed topics in neurose evant to the lectures furt. Presenting the N loquia at the institute	r, sensory systems, moto , rhythmic control of ne mental neurology, patho re diseases of the nervou enetics. ciences I and II Master's programme.	or control, nervous rve function and a plogy and diagnos us system and med	tics, lical
The students gai applications. The various specific a	in broad interdisciplinar y learn about neuroscient reas and paradigms in ne of an oral presentation.	ific research concep	ts and should be in the	e position to link	togethe
applications. They various specific a	y learn about neuroscient reas and paradigms in ne of an oral presentation.	ific research concep	ts and should be in the	e position to link	togethe
The students gai applications. The various specific a papers in the form Requirements for pa	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating	ific research concep	ts and should be in the	e position to link	togethe
The students gai applications. The various specific a papers in the form Requirements for pa None Helpful previous kn None	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge	ific research concepturosciences. They were a series of the series of th	ts and should be in the vill be able to critically	e position to link assess scientific	togethe
The students gain applications. The various specific a papers in the form Requirements for parallelements for parallements for parallements for parallelement	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge	ific research concepturosciences. They we have a second se	ts and should be in the vill be able to critically	e position to link assess scientific	togethe
The students gai applications. They various specific a papers in the form Requirements for pa None Helpful previous kn None Assignment of modu	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci	e position to link / assess scientific ence / FB15	togethe
The students gai applications. They various specific a papers in the form Requirements for pa None Helpful previous km None Assignment of modu Suitable for other co Times offered	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nce per year, winter sem	e position to link / assess scientific ence / FB15 eester	researc
The students gain applications. They various specific a papers in the form Requirements for paralleling None Helpful previous km None Assignment of modu Suitable for other continues Duration	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nce per year, winter sem odule covers the first tw	e position to link / assess scientific ence / FB15 tester /o semesters of the	researc
The students gai applications. The various specific a papers in the form Requirements for paralytic papers in the form Requirements for paralytic papers None Helpful previous km None Assignment of modu Suitable for other co Times offered Duration Person in charge	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge lle (course / department) purses	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nce per year, winter sem	e position to link / assess scientific ence / FB15 tester /o semesters of the	togethe
The students gai applications. The various specific a papers in the form Requirements for paral None Helpful previous km None Assignment of modu Suitable for other co Times offered Duration Person in charge Confirmation of modu	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge ile (course / department) purses dule completion:	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nee per year, winter sem odule covers the first tw ead of examination boar	e position to link / assess scientific ence / FB15 eester /o semesters of the d	togethe researc
The students gai applications. The various specific a papers in the form Requirements for paralytic papers in the form Requirements for paralytic papers None Helpful previous km None Assignment of modu Suitable for other co Times offered Duration Person in charge	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge ile (course / department) purses dule completion: ation	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nee per year, winter sem odule covers the first tw ead of examination boar all units (except lecture minar talk in both semin	e position to link / assess scientific ence / FB15 ester /o semesters of the d s)	togethe researc
The students gai applications. The various specific a papers in the form Requirements for pa None Helpful previous km None Assignment of modu Suitable for other co Times offered Duration Person in charge Confirmation of mod Proof of particip	y learn about neuroscient reas and paradigms in ne of an oral presentation. articipating owledge ile (course / department) purses dule completion: ation	ific research concept purosciences. They we have a second	ts and should be in the vill be able to critically rerdisciplinary Neurosci nce per year, winter sem odule covers the first tw ead of examination boar all units (except lecture	e position to link assess scientific ence / FB15 ester o semesters of the d s) nars (WiSe, SoSe)	e course

Modul exam			Forn	n / duration	/ content(if	applicable)	
Cumulative module exam:		One written exam (90 minutes long) per set of lectures:"Neuroscience I –selected topics" and "Neuroscience II – selected topics" (each at the en of a semester)					
Determination of module gr	ading		arithr exam	metic averag 18	e of the grad	les of both v	vritten
Introduction to Neuroscience	Form of teaching	SWH	СР	1	Sem 2	lester 3	4
Lecture Selected topics in Neurosciences I	L, SeStu	3	4	X			
Seminar to the lecture Selected topics in Neurosciences I	S, SeStu	1	2	X			
Lecture Selected topics in Neurosciences II	L, SeStu	2	3		Х		
Seminar to the lecture Selected topics in Neurosciences II	S, SeStu	1	2		Х		
Introductory session	L, S	0.5	0.5	Х			
Colloquia	Ко	0.5	0.5	2	K		
Weekend seminar	S, SeStu	2	1	X			
Module exam			0	Х	Х		
Sum		10	13				

INS BM	Einführung in Basismethoden der	Compulsory module	13 CP = 390 h		11 SWH
Introduction into Basic Methods in Neuroscience	Neurowissenschaften		Contact study 11 SWH / 165 h	Self study 225 h	SWI

Content

The module focusses on the following areas:

(1) <u>Methods of cell biology, molecular biology and genetics</u>: Imparting of knowledge on practical and theoretical basics for working with chemical solutions, physical-chemical features of proteins and their isolation, subcellular fractioning and centrifugation, preparation of cell cultures, immune-histology and microscopy and the basic principles of molecular genetics and genomics.

(2) <u>Anatomy of the central nervous system:</u> Using slices, plastic models and stored data-sets the structure and the development of the human brain and spinal cord are shown, including the autonomous nervous system and the cerebral blood supply. Furthermore imaging methods like MRI and fMRI are introduced. Also the evaluation of brains and animal model organisms are discussed.

(3) <u>Electrophysiology</u>: In lectures and seminars/discussions the basics of membrane potentials, action potentials, forwarding of potentials, synaptic morphology/geometry/function are dealt with. Important methods for recognition and analysis of single neurons (extracellular, intracellular, patch-clamp) and neural networks activity are discussed. Both electrical and optical techniques of neural stimulation are presented.

(4) <u>MATLAB-programming and statistics</u>: Basics of programming of neural data recordings and analysis with MATLAB are discussed. A focus lies on practical programming exercises. Basic statistical methods are introduced, discussed and realised in MATLAB.

(5) Legal and ethical aspects of animal experimentation, genetic manipulations, biological safety and proper scientific conduct are imparted.

Objectives

Within this module the students learn to discuss intensely and independently theoretical as well as practical contents of the study. They attain practical competence in cellular and molecular lab techniques, cell culture techniques and programming of neuro-biological questions in MATLAB. When having finished the module they have basic knowledge on neurogenetics. They have fundamental knowledge on human brain anatomy as well as animal models, can identify important cerebral structures and interpret histological preparations adequately. They possess basic knowledge regarding neural potentials and synaptic mechanisms and can assess potentialities and limitations of electro-physiological technologies. They can apply adequate statistical methods in assessing significance and comparison of neural records. They will attain competence regarding rules of good scientific practice, and to keep the directives regarding genetic works, bioassay practices, and animal welfare.

Requirements for participating

None

Helpful previous knowledge

None	
Assignment of module (course/department)	MSc Interdisciplinary Neuroscience / FB15
Suitable for other courses	no
Times offered	Once per year, 1. half of the winter semester
Duration	6 weeks (3-4 days per week)
Person in charge	Head of examination board
Confirmation of module completion:	
Proof of participation	Regular participation in all units
Course assessment	Successful (at least grade 4 =,,sufficient") performance in graded tests following each teaching unit listed under ,,content"

Teac	hing forms			Prac	tical, lecture	, seminar, ex	ercises, self	study
Tuiti	on language			Engl	ish			
Mod	ule exam			Forn	n / duration /	content (if aj	oplicable)	
Fi	nal modul exam			none				
		Form of teaching	SWH	СР	Semester			
		8			1	2	3	4
	ntroduction into Basic Aethods in Neuroscience	L, S, P, exercises, SeStu	11	13				
	Aethods of cell biology, nolecular biology and genetics							
	natomy of the central nervous ystem				x			
E	lectrophysiology							
	IATLAB programming and tatistics							
	egal and ethical aspects of nimal experimentation							
S	um		11	13				

	Einführung		-	oulsory		$15 \mathrm{CP} = 43$	50 h		15
mittinous in	ieurowissei Arbeitstech	nschaftliche niken	modu	le		Contact st 15 SWH /	·	Self-study 225 h	SWH
Content								1	•
The module is a pra much as possible ab their Master's projec	out the mo	ost important e	experin	nental t	echniqu	les recomme	nded for	the specialise	
Objectives									
After completing the Master's project in the publications and the criticizing methods a	heir chosen Internet and	topic. They wa	ill be a	ble to e	fficient	ly find inform	nation at	out methods fi	om
Requirements for part									
Successful completion						s" and the m	nodule "E	Basic Methods	n
Neuroscience" as we Helpful previous know		t 2 out of the 3	s electi	ve mod	ules				
	leuge.								
Assignment of module	(course/de	partment)			Inter	disciplinary	Neurosci	ence / FB15	
Suitable for other cour	rses				no				
Times offered					As of	f 3 rd semeste	r of the c	ourse	
Duration					6 we	eks			
Person in charge					Repr	esentatives c	of elective	e modules	
Confirmation of comp	letion								
Participation									
Course assessment					Pract	cical protocol	1		
Teaching forms					Pract	tical, self-stu	dy		
Tuition language					Engl	ish			
Module exam					Form	n / duration	/ conten	t (if applicabl	e)
	exam				none				
Module completion									
Module completion Methods in Neurose	cience	Tanching form	m a 1	сwл	CP	Semester			
-	cience	Teaching form	ns	SWH	СР	Semester 1	2	3	4

	Forschungs	konzepte in	Compulsory	/	16 CP =	= 480 h		16
Current Concepts in Neuroscience	den Neurowisser		module		Contac 16 SW	t study H / 245 h	Self-study 235 h	⁷ SWH
Content								
The module include theoretical background scientific papers, t them.	ound for deve	eloping a researc	h concept in	one neu	ırobiologi	cal topic. A	After working	g on recent
Weekendseminar:								
Presentation and d relevant aspects in			in the neuros	science	s; themat	isation of e	ethical and le	gally
Objectives								
The students attain methods in neuros concerning bioassa Requirements for pa Successful comple Neuroscience" as	cience like no ay practise, p articipating etion of the m	eural stimulation rotection of anim odule "Introduct	or neuroenhals directive	anceme s and an science	nt. They with the second se	will attain t fare act.	topical know	ledge
Helpful previous kno	owledge:							
Assignment of modu	le (course/de	epartment)		Inte	rdisciplin	ary Neuros	science / FB	5
Suitable for other co		* *		no				
Times offered						ester of the	e course	
Duration					eeks			
Person in charge				Rep	oresentativ	ves of elect	ive modules	
Confirmation of com	ipletion							
Participation Course assessmen				Turi	ton recon	ch concep	t	
Teaching forms	n					ninar, self-		
Tuition language					glish		Judy	
Module exam						tion / cont	ent (if appli	cable)
Module completio	n exam						seminar talk	
	e in	Teching forms	SWH	CP	Semeste	er		
Current Concept	5 III - i	1 coming tormo		1	1			
Current Concept Neuroscience	5 111				1	2	3	4
		P, SeStu	15	15	1	2	3 X X	4

INS MA			mpulsory	r	30 CP = 90	00 h		30
Masterthesis		mo	dule		Contact st 30 SWH /		Self-study 450 h	SWH
Content								
question for a pe written up in a N	aster's degree a student t criod of 6 months. The w faster's thesis in the style s by the supervisor and a	ork can be e of a scier	experime ntific pape	ntal, en	npirical or an	nalytic. 7	The results mus	t be
Objectives								
The students wil	l be able to work intensi tion of modern research							
Requirements for p	oarticipating							
Proof of at least								
Helpful previous k	nowledge:							
	lule (course/departmen	t)		Inte	rdisciplinary	Neuros	cience / FB15	
Suitable for other o	courses			No				
Times offered				The	timing is op	on		
Times offered				The	unning is op	CII		
Duration				6 m	onths			
Person in charge				Rep	resentatives	of electi	ve modules	
Confirmation of co	mpletion			Non	e			
Participation Course assessm	t							
Teaching forms	ent			Prac	tical, self-stu	udv		
Tuition language				Eng		udy		
Module exam				0		1/ conte	nt (if applicab	le)
Module complet	ion exam			thes		s will ca	he form of a M arry double the odules	
Mastartheret	T 1'	- C	CWII	СР		S	emester	
Masterthesis	Teaching	g torms	SWH		1	2	3	4
Masterthesis	P, SeStu		30	30				Х

Elective Modules Subject Area A: Basic Neuroscience

	Externes Pra		Elective n	odule		11 CP = 3	330 h		11
	"Neurowisse Grundlagent	nschaftliche forschung"				Contact s 11 SWH /		Self-study 165 h	SWH
Content			•					1	•
The practical provid on own topical proj to present scientific The module can be foreign countries as	ects under i work throu e offered by	nstructions and gh writing up a y departments	l introduce in appropria of the Goe	the result ate result othe unive	ts ir pro ersi	n the form ptocol.	n of a semi	nar talk. They	learn how
Objectives									
The students gain king learn working indep								a of basic resea	rch. They
Requirements for partic none	ipating								
Halafal anadara harada									
Helpful previous knowle	edge:								
none									
Assignment of module (course/depai	rtment)		Int	erd	isciplinar	y Neurosci	ence / FB15	
Suitable for other course	es								
Times offered				De	per	nding on p	provider		
Duration				De	per	nding on p	orovider		
Person in charge								d of the master Neuroscience	's degree
Confirmation of comple	tion				- 1				
Participation					-	ar particij			
Course assessment								vider of the ele	
								a working repo	
								be given on bot	
				of	ow	n experim	nents and t	opical literatur	e.
Tooshing from				D		col colf -	tudy		
Teaching forms						cal, self-s			
Tuition language					1	0 1		if applicable)	
Module exam Module completion ex	vom							vider of the ele	ativa
would completion ex	хаш					le are app		vider of the ele	etive
				Ifg	grad	ding is no	t scheduled	d by the provid shows a graded	er, the l protocol.
External Practical M	Iodule	Teaching form	s SWI	н ср		Semester			
"Basic Neuroscience	"	Teaching form	s [5W]			1	2	3	4
Practical		P, SeStu	11	11					
Module exam							Х		
Sum			11	11					

	eitgeber-Mechanisı		Elective modu	ıle	11 CP = 33	0 h		11
	Säugerneuronen u euroendokrinen Ze				Contact stu 11 SWH / 1		Self-study 165 h	— SWH
Content					1			
The practical presen students analyze the and write up the resu talk they present or introduced: immunol	cellular and molec lts. Then the resul iginal research fr	cular eler ts obtaine om the	nents for chi ed are presen area of chro	onobio ted in t	logical beha he form of a obiology. T	viour, wo seminar 'he follov	orking under su talk. In a furtho wing technique	pervision, er seminar es will be
Objectives								
Basic knowledge abo in chronobiological s								
Requirements for particip	ating							
none	0							
Helpful previous knowled	ge:							
none								
Assignment of module (co	ourse/department)			Inter	disciplinary	Neurosci	ence / FB15	
Suitable for other courses	,							
Times offered				Onc	e per year, si	ummer se	mester	
Duration				4 we	eks			
Person in charge				Prof	Eric Maron	de		
Confirmation of completi	on							
Participation				Reg	ular participa	ition		
Course assessment				expe		eminar ta	lts of one's own lk on current	1
Teaching forms				Prac	tical, self-stu	ıdy		
Tuition language				Engl	ish			
Module exam							if applicable)	
Module completion exa	am			Grad	led protocol	or writte	n exam (45 min	utes)
Clock Mechanisms	in _{Tanahi}	ng forms	SWH	СР	Semester			
Mammalian Neuron Neuroendocrine Ce	ns and	ig iorilis	ЗМП	Ur	1	2	3	4
Practical	P, SeS	tu	11	11				
Module exam	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					X		
Sum			11	11	1			

	leurobiolog	ie des I	Elective mod	ule	11 CP = 33	30 h		11
	Vematoden Caenorhabdi	tis elegans			Contact st 11 SWH /	-	Self-study 165 h	SWH
Content		I			1		1	
This practical focuse as more general mol behaviour assays w acetylcholine recep neuromuscular syna proteins) or endoger lab's standard reper <i>elegans</i> by light, tra electrophysiological method is too compl The students work of the form of a semina	ecular biolo ithout and tors, GAB pses. In ac nous protein toire. More insmitted by conductant icated to le	by methods, this with the effect A receptors) the dition, cell biole ins (using specific e specialised me y the transgene effect ice from <i>C. eleg</i> arn in 6 weeks).	s involves ge of specific lat are use ogy method c antibodies thods that a expressed, p <i>ans</i> muscle under the s	enetic m agonists d for g s for ez) in rela tre used hoto-act cells (upervisi	ethods (cross for ligand general cha consistent cha	sses, geno mediated racterizationalysis of genetic banous stimu on channe hly as a o o student a	typing) as well l ion channels ion of the fu transgenes (G uckground are p ulation of neur l rhodopsin-2, demonstration, and present the	as simple (nicotinia unction o TP-fusion part of the rons in <i>C</i> as well a since the e results in
Objectives Familiarity with star crosses, cell biology relevant publications Requirements for partici none Helpful previous knowled	methods, 1 s. pating							
none	uge.							
		4		Tuta		NT	/ ED15	
Assignment of module (co Suitable for other courses	-	tment)		Inter	disciplinary	Neurosci		
Times offered	8							
				Twie	e ner vear	winter ser		r semeste
				_		winter ser	nester, summer	r semeste
Duration				4-6 v	weeks		nester, summer	r semester
Duration Person in charge	ion			4-6 v			nester, summer	r semeste
Duration Person in charge Confirmation of completi	ion			4-6 v Prof	weeks Alexander	Gottschal	nester, summer	r semeste
Duration Person in charge Confirmation of completi Participation	ion			4-6 v Prof.	veeks Alexander ılar participa	Gottschal ation	nester, summer k	
Duration Person in charge Confirmation of completi	ion			4-6 v Prof. Regu 1 ser	veeks Alexander ılar participa	Gottschal ation n the resul	nester, summer	
Duration Person in charge Confirmation of completi Participation	ion			4-6 v Prof. Regu 1 ser expe	veeks Alexander Ilar participa ninar talk or	Gottschal ation 1 the resul rk report	nester, summer k	
Duration Person in charge Confirmation of complete Participation Course assessment	ion			4-6 v Prof. Regu 1 ser expe	veeks Alexander Ilar participa ninar talk or riments, wo tical, self-str	Gottschal ation 1 the resul rk report	nester, summer k	
Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms				4-6 v Prof. Regu 1 ser expe Prac Engl Forn	veeks Alexander ilar participa ninar talk or riments, wo tical, self-stu ish	Gottschal ation 1 the resul rk report udy ' content (i	nester, summer k	
Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Neurobiology of the Nematode Caenorh	am	Teaching forms	SWH	4-6 v Prof. Regu 1 ser expe Prac Engl Forn	veeks Alexander Ilar participa ninar talk or riments, wo tical, self-stu ish n / duration /	Gottschal ation 1 the resul rk report udy ' content (i	nester, summer k lts of one's own	
Duration Person in charge Confirmation of complete Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Neurobiology of the	am		SWH	4-6 v Profi Regu 1 ser expe Prac Engl Forn Grad	veeks Alexander ilar participa ninar talk or riments, wo tical, self-stu ish h / duration / led protocol Semester	Gottschal ation 1 the resul rk report udy ' content (i	nester, summer k lts of one's own	n
Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Neurobiology of the Nematode Caenorh elegans	am	Teaching forms P, SeStu		4-6 v Prof Regu 1 ser expe Prac Engl Forn Grad	veeks Alexander Ilar participa ninar talk or riments, wo tical, self-str ish A / duration / led protocol Semester 1	Gottschal ation 1 the resul rk report udy ' content (i	nester, summer k lts of one's own	n

	Neuropharma	kologie	Elective mod	ule	11 CP = 330 h		11 SWI
Neuropharmacology					Contact study 11 SWH / 165 h	Self-study 165 h	- SWH
Content							
neurodegenerative methods, with a experiments, stud measurements of	e disease such a focus on micro dents will be neurotransmit include invest	as stroke and o odialysis which trained to me ters (e.g. accessing tigations of the	dementia of th ch allows acc nanufacture pr etylcholine, gl	e Alzhe ess to t robes fe utamate	ogy. Our lab works simer type. We use in he extracellular fluid or microdialysis stude and energy metable system and of the e	vitro- as well as l. In demonstrati dies and will ca olites (glucose,	in vivo- ions and arry out lactate).
in a way that wo	ould permit pub resented as sem	olication; thus	s, the students the end of the	will le module	vze their data both gra earn basics of scienti . In a further seminar nacology.	fic work. The in	dividual
Objectives							
practice of microc	lialysis, analysi	is of neurotrar	nsmitters and 1	netabol	edge in animal experi ites with chromatogra of relevant literature	phic (HPLC) and	
Requirements for part	icipating						
none	LB						
Helpful previous know	ledge:						
none							
Assignment of module	(course/departm	ment)		Inter	disciplinary Neurosci	ence / FB15	
Assignment of module Suitable for other cour	· •	ment)		Inter yes	disciplinary Neurosci	ence / FB15	
~	· •	ment)		yes Twie	ee per year, winter ser		semester
	· •	ment)		yes	ee per year, winter ser		emester
Suitable for other cour Times offered	· •	ment)		yes Twic 4 we	ee per year, winter ser		semester
Suitable for other cour Times offered Duration Person in charge	rses	ment)		yes Twic 4 we	ee per year, winter ser eks		emester
Suitable for other cour Times offered Duration	rses	ment)		yes Twic 4 we Prof	ee per year, winter ser eks		emester
Suitable for other cour Times offered Duration Person in charge Confirmation of comp	letion	ment)		yes Twid 4 we Prof Regu 1 set expe	ee per year, winter ser eks Jochen Klein	nester, summer s	emester
Suitable for other cour Times offered Duration Person in charge Confirmation of comp Participation Course assessment	letion	ment)		yes Twic 4 we Prof Regu 1 ser expe publ	ee per year, winter ser eks Jochen Klein lar participation ninar talk on the resu riments, 1 seminar ta	nester, summer s	emester
Suitable for other cour Times offered Duration Person in charge Confirmation of comp Participation Course assessment Teaching forms	letion	ment)		yes Twic 4 we Prof Regu 1 ser expe publ	ee per year, winter ser eks Jochen Klein lar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study	nester, summer s	emester
Suitable for other cour Times offered Duration Person in charge Confirmation of compl Participation	letion	ment)		yes Twic 4 we Prof Regu 1 set expe publ Prac Engl	ee per year, winter ser eks Jochen Klein lar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study	nester, summer s	emester
Suitable for other cour Times offered Duration Person in charge Confirmation of compl Participation Course assessment Teaching forms Tuition language	letion	ment)		yes Twid 4 we Prof Regu 1 ser expe publ Prac Engl Form	ce per year, winter ser eks Jochen Klein Ilar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study ish	nester, summer s	emester
Suitable for other cour Times offered Duration Person in charge Confirmation of compl Participation Course assessment Teaching forms Tuition language Module exam	exam	ment)	s SWH	yes Twid 4 we Prof Regu 1 ser expe publ Prac Engl Form	ee per year, winter ser eks Jochen Klein Ilar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study ish h / duration / content (led protocol	nester, summer s lts of one's own lk on current if applicable)	
Suitable for other cour Times offered Duration Person in charge Confirmation of compl Participation Course assessment Teaching forms Tuition language Module exam Module completion Neuropharmacol	exam	Teaching forms		yes Twid 4 we Prof Regu 1 sen expe publ Prac Engl Form Grac	ce per year, winter ser eks Jochen Klein ilar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study ish h / duration / content (led protocol	nester, summer s	semester
Suitable for other cour Times offered Duration Person in charge Confirmation of compl Participation Course assessment Teaching forms Tuition language Module exam Module completion	exam		s SWH	yes Twid 4 we Prof Regu 1 ser expe publ Prac Engl Forn Grac	ee per year, winter ser eks Jochen Klein Ilar participation ninar talk on the resu riments, 1 seminar ta ications, work report tical, self-study ish h / duration / content (led protocol	nester, summer s lts of one's own lk on current if applicable)	

	Zelluläre	Elective mod	ule	11 CP = 33	11 CP = 330 h			
of Dopaminergic C Neurons	Neurophysio dopaminerg				Contact stu 11 SWH / 1	udy 165 h	Self-study 165 h	- SWH
Content								
The practical cover electrodes) of the d projects under supe present an original Parkinsos's disease activity (current-cl characterisation of t with various config The students learn involves interdiscip	lopaminergi ervision and piece of re- e, schizophr lamp) and this neurona urations of about the	c midbrain sys present their r search from the enia, drug add measuring (al activity medi the patch-clamp associated stor	tem of mice <i>i</i> esults in the f e field of basa iction). The n voltage-clamp ated by synap o technique. T chastic backgr	<i>n vivo</i> orm of l gangli nain foc) as tic and his also ound a	and <i>in vitro</i> a seminar ta a neurophys cuses are m well as bi post-synapt includes us nd how to	The stuc alk. In a f siology ar easuring a ophysical ic mechan ing statist use the re	lents work on t urther seminar ad pathophysiol and evaluating and pharma iisms (e.g. ion c ical evaluation	heir own talk they ogy (e.g. neuronal cological channels) methods.
Objectives Familiarity with car dopaminergic neuro biophysical and pha clamp technique with activity. Stochastic molecular pathophy corresponding mous Requirements for particin none	ons <i>in vivo</i> a armacologic th neuroana description vsiological c se models.	and <i>in vitro</i> , using al properties of tomical and im and statistical a	ng and evaluat synaptic and munohistologi malysis of the	ing the post-syr cal anal recorde	patch-clamp haptic ion ch lyses. Basic rd time seque	e technique annels. Co computer ence data.	e to characterise ombination of tl modelling of n Understanding	ne patch- euronal the
Helpful previous knowle	edge:							
Assignment of module (c	course/depai	tment)		T .	1 1.			
		••••••		Inter	disciplinary	Neuroscie	ence / FB15	
Suitable for other course				Inter	disciplinary	Neuroscie	ence / FB15	
Times offered				Once	e per year, si			
Times offered Duration				Once 4 we	e per year, si eks	ummer sei		
Times offered Duration Person in charge	tion			Once 4 we	e per year, si	ummer sei		
Times offered Duration Person in charge Confirmation of complet	tion			Once 4 we Prof.	e per year, si eks Jochen Roe	ummer sei eper		
Suitable for other course Times offered Duration Person in charge Confirmation of complet Participation Course assessment	tion			Once 4 we Prof. Regu 1 ser expe	e per year, su eks Jochen Roe Ilar participa ninar talk or riments, 1 so	ummer ser eper ation a the resul eminar tal		
Times offered Duration Person in charge Confirmation of complet Participation Course assessment	tion			Once 4 we Prof. Regu 1 ser expe publi	e per year, su eks Jochen Roe Ilar participa ninar talk or	ummer ser eper ation n the resul eminar tal rk report	mester ts of one's own	
Times offered Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms	tion			Onco 4 we Prof. Regu 1 ser expe publi Prac	e per year, su eks Jochen Roe ilar participa ninar talk or riments, 1 so cations, wo tical, self-stu	ummer ser eper ation n the resul eminar tal rk report	mester ts of one's own	
Times offered Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms Tuition language				Once 4 we Prof. Regu 1 ser expe publ Prac Engl Forn	e per year, su eks Jochen Roe Ilar participa ninar talk or riments, 1 so ications, wo tical, self-stu ish	ummer ser eper ation n the resul eminar tal rk report idy content (i	mester ts of one's own	
Times offered Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Cellular Neurophy	xam vsiology	Teaching forms	s SWH	Once 4 we Prof. Regu 1 ser expe publ Prac Engl Forn	e per year, su eks Jochen Roe ilar participa ninar talk or riments, 1 so ications, wo tical, self-stu ish h / duration / ded protocol Semester	ummer ser eper ation a the resul eminar tal rk report ady content (i	mester ts of one's own k on current f applicable)	
Times offered Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Cellular Neurophy of Dopaminergic N	xam vsiology	-		Once 4 we Prof. Regu 1 ser expe publ Prac Engl Forn Grad	e per year, su eks Jochen Roe ilar participa ninar talk or riments, 1 so ications, wo tical, self-stu ish 1 / duration /	ummer ser eper ation n the resul eminar tal rk report idy content (i	mester ts of one's own k on current	4
Times offered Duration Person in charge Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Cellular Neurophy	xam vsiology	Teaching forms P, SeStu	5 SWH 11	Once 4 we Prof. Regu 1 ser expe publ Prac Engl Forn Grad	e per year, su eks Jochen Roe ilar participa ninar talk or riments, 1 so ications, wo tical, self-stu ish h / duration / ded protocol Semester	ummer ser eper ation a the resul eminar tal rk report ady content (i	mester ts of one's own k on current f applicable)	4

INS A-10	Neurophysiolog	jie und	Elect	ive modu	ıle	11 CP = 330 h		11 CW/I
Neurophysiology and Behaviour	Verhalten					Contact study 11 SWH / 165 h	Self-study 165 h	SWH
Content								
project on a them clamp conductand brain preparation pharmacology, e drosophila) are u work, neuromodu	ne defined togeth ce, intracellular o l, confocal laser extracellular con- sed as model or llation, learning b	ner beforeha conductance microscopy ductance, 1 ganisms. Th pehaviour, ol	nd. The, calci y, fluc learnin he prir lfactor	ne techni ium imagorescence g and nciple ar	ques th ging, ce e micro memory eas are ry form	bur control. The stud at are taught include ell culture); neuroana oscopy); behavioural y, social behaviour ; how ion channels a ation, and social behaviour soster. In a further ser	: cell physiolog tomy (staining experiments (). Insects (hor and transmitter aviour of bees.	gy (patch- methods, behaviour ney bees, receptors
and the students familiar with writ	receive comprehe ing a scientific p	ensive feedl ublication by	back a y prod	bout the ucing a	conten protoco	apers. These presenta t and style of the pro- l in the form of a pap	esentation. The er.	y become
planning to carryi						e students mostly we	ork independer	my, from
Objectives								
Planning, carrying	anatomical metho	ods. How to				easuring ion flow; obs estions, working with		
Requirements for part	ticinating							
none	icipating							
Helpful previous know	vledge:							
none								
Assignment of module	(course/departme	ent)			Inter	disciplinary Neurosci	ence / FB15	
Suitable for other cour		,			yes			
Times offered					Once	e per year, summer se	mester	
Duration					4 we			
Person in charge					Prof.	Bernd Grünewald		
Confirmation of comp	letion							
Participation	iction				Regu	lar participation		
Course assessment	•				U	ninar talk on the result	Its of one's own	
- Course assessment						riments, 1 seminar tal		1
						cations, work report		
Teaching forms					Pract	tical, self-study		
Tuition language					Engl	ish		
Module exam Module completion	exam					i / duration / content (i ed protocol	if applicable)	
Neurophysiology Behaviour	r and Te	eaching forms	s	SWH	СР	Semester 1 2	3	4
Practical	P	, SeStu		11	11	<u> 1 </u>	3	+
Module exam	1,	, 50514		11	11	Х		
Sum				11	11			
•						•		

			ective modu	le	11 CP = 33	0 h		11
The Neuro-Vascular Interface	Schnittstelle				Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content								
developmental an of the blood-brain experiments in the basic mouse gene pathway as well a hybridization and infection techniqu protein gel electro The results of the the end of the cou	rse offers basic theored d pathological neurob n barrier (BBB), and e laboratory to elucida tics techniques and th s conditional/inducibl immunohistochemist ues, immunofluorescen- phoresis, Western blo practical course are p urse. The students also members of the group cts.	biology. Pri its relevant ate the mole he handling le gain- and ty, isolation nce, confoct of and immu- presented bo take part of	incipal area nce for ne ecular mec of transge d loss-of-fu n of primatical and live unoprecipit by every stron the wee	as of re uronal hanism nic mid unction ry corti te-cell r tation. udent c kly lab	essearch are t function. The s of BBB force (various r s strains), pr ical microve microscopy, on the form of meetings w	the develo the student primation. The porter me occessing of essels from biochemic of a writtee there they	pment and ma s take part or Their work may ouse strains fo of brain tissue to n mice, transfe cal techniques on protocol and learn about the	intenance n ongoing y include: r the Wnt for in situ ection and including d a talk at e ongoing
handle mouse tiss		iments. The						
none				T.	1 1.	<u>.</u>		
Assignment of module				Inter	disciplinary	Neuroscie		
Suitable for other cour	ses						ence / FB15	
Times offered				yes				
				Once	e per year, su	ummer ser		
				Once 4 we	eks			
Person in charge				Once 4 we				
Person in charge Confirmation of comp	etion			Onco 4 we PD I	eks Dr. Stefan Li	ebner		
Person in charge				Onco 4 we PD I Regu 1 set	eks Dr. Stefan Li Ilar participa ninar talk or	ebner ntion n the result	nester s of one's owr	1
Person in charge Confirmation of comp Participation				Once 4 we PD I Regu 1 ser expe publ	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, wor	ebner ation a the result eminar tall rk report	nester s of one's owr	
Person in charge Confirmation of comp Participation Course assessment				Once 4 we PD I Regu 1 ser expe publ Prac	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, wor tical, self-stu	ebner ation a the result eminar tall rk report	nester s of one's owr	1
•				Onco 4 we PD I Regu 1 ser expe publ Prac Engl	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, won tical, self-stu ish	ebner ation a the result eminar tall rk report ady	nester s of one's owr c on current	1
Person in charge Confirmation of comp Participation Course assessment Teaching forms Tuition language				Onco 4 we PD I Regu 1 ser expe publ Prac Engl Form	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, wor tical, self-stu	ebner ation a the result eminar tall rk report ady	nester s of one's owr c on current	1
Person in charge Confirmation of comp Participation Course assessment Teaching forms Tuition language Module exam Module completion The Neuro-Vasce	exam	ng forms	SWH	Onco 4 we PD I Regu 1 ser expe publ Prac Engl Form	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, wor tical, self-stu ish n / duration / led protocol Semester	ebner ation a the result eminar tall rk report ady content (if	nester s of one's owr c on current ' applicable)	
Person in charge Confirmation of comp Participation Course assessment Teaching forms Tuition language Module exam Module completion The Neuro-Vascu Interface	exam ılar Teachin			Onco 4 we PD I Regu 1 ser expe publ Prac Engl Form Grac	eks Dr. Stefan Li ilar participa ninar talk or riments, 1 se ications, wor tical, self-stu ish n / duration / led protocol	ebner ation a the result eminar tall rk report ady	nester s of one's owr c on current	
Person in charge Confirmation of comp Participation Course assessment Teaching forms Tuition language Module exam Module completion The Neuro-Vasce	exam		SWH 11	Onco 4 we PD I Regu 1 ser expe publ Prac Engl Forn Grac	eks Dr. Stefan Li Ilar participa ninar talk or riments, 1 se ications, wor tical, self-stu ish n / duration / led protocol Semester	ebner ation a the result eminar tall rk report ady content (if	nester s of one's owr c on current ' applicable)	

	Embryonale und adulte	Elective modu	ıle	11 CP = 330	11 CP = 330 h			
Embryonic and Adult Neurogenesis	Neurogenese			Contact stu 11 SWH / 1		Self-study 165 h	- SWH	
Content								
	tical course are principles ning cell fate specification							
addition, one origin discussed. The resu of a short research	on their own projects with nal publication from recer- ults obtained during the co n paper or of a short gra- two important forms of so	nt literature relevourse will be reconstructed out the second sec	vant to corded n orde	his/her resea in a written 1	rch proje esults pr	ect will be prese otocol either in	nted and the form	
Objectives								
organisms used are vitro; working with biochemical technic	te teaches basic techniques mice and chick embryos. a cell lines and primary cel ques (sub cellular fraction king with transgenic anima	Emphasis will b ll cultures (embr ation, protein pu	oe place ryonic a	ed on retrovir and adult neu	al gene t ral stem	ransfer <i>in vivo</i> a and progenitor c	nd <i>in</i>	
Requirements for partic	cipating							
none	g							
Helpful previous knowle none						(777.4.5		
Assignment of module (- · ·			disciplinary	Neurosci	ence / FB15		
Suitable for other cours	es		yes					
Times offered			0					
Duration				e per year, su	mmer se	mester		
Duration Porson in charge			4 we	eks		mester		
Person in charge	tion		4 we			mester		
Person in charge Confirmation of comple	tion		4 we Prof	eks Dorothea Sc	chulte	mester		
Person in charge	tion		4 we Prof Regu 1 set expe	eks Dorothea Sc Ilar participa ninar talk on riments, 1 se	chulte tion the resul minar tal	ts of one's own		
Person in charge Confirmation of comple Participation Course assessment	tion		4 we Prof Regu 1 set expe publ	eks Dorothea So Ilar participa ninar talk on	chulte tion the resul minar tal k report	ts of one's own		
Person in charge Confirmation of comple Participation	tion		4 we Prof Regu 1 set expe publ	eks Dorothea So Ilar participa ninar talk on riments, 1 se ications, wor tical, self-stu	chulte tion the resul minar tal k report	ts of one's own		
Person in charge Confirmation of comple Participation Course assessment Teaching forms			4 we Prof Regg 1 ser expe publ Prac Engl Form	eks Dorothea So Ilar participa ninar talk on riments, 1 se ications, wor tical, self-stu	chulte tion the resul minar tal k report dy	ts of one's own k on current		
Person in charge Confirmation of comple Participation Course assessment Teaching forms Tuition language Module exam	xam	ns SWH	4 we Prof Regg 1 ser expe publ Prac Engl Form	eks Dorothea So Ilar participa ninar talk on riments, 1 se ications, wor tical, self-stu ish n / duration /	tion the resul minar tal k report dy content (i	ts of one's own k on current	4	
Person in charge Confirmation of comple Participation Course assessment Teaching forms Tuition language Module exam Module completion e Embryonic and A	xam	ns SWH 11	4 we Prof Regg 1 ser expe publ Prac Engl Forn Grac	eks Dorothea So Ilar participa ninar talk on riments, 1 se ications, wor tical, self-stu ish n / duration / led protocol Semester	chulte tion the resul minar tal k report dy	Its of one's own k on current f applicable)	4	
Person in charge Confirmation of comple Participation Course assessment Teaching forms Tuition language Module exam Module completion e Embryonic and A Neurogenesis	xam dult Teaching forr		4 we Prof Regu 1 sen expe publ Prac Engl Form Grac	eks Dorothea So Ilar participa ninar talk on riments, 1 se ications, wor tical, self-stu ish n / duration / led protocol Semester	tion the resul minar tal k report dy content (i	Its of one's own k on current f applicable)	4	

INS A-15	trophysiological Ableitungen an sich frei			11 CP = 330) h		11
Electrophysiological recordings in freely behaving animals	Ableitungen an sich fr bewegenden Tieren	'el		Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content							
animals. Students working memory t train animals to pe how to extract the analyze these signa	l introduce students t will record neural acti ask and analyze the ne erform a behavioral ta spiking of individual r als in relation to each o yzed at the end of the p k in a journal club.	ivity extracellu eural data in re sk, how to per neurons as wel other and the a	larly from t lation to the form extrac l as local fie nimals' beh	he hippocamp animal's beh ellular record ld potentials avior. Studen	pus of mi avior. Stu ings in fi from the ts will pr	ice performing udents will lea reely behaving neural data; a esent the data	g a spatial rn how to g animals; nd how to they have
Objectives							
behaving animals; test them.	g; basic knowledge of t ability to generate scie						
Requirements for partie	zipating						
Helpful previous knowl	edge:						
none							
			T.	1 1.		(FD 1 6	
Assignment of module (<u> </u>			rdisciplinary	Neuroscie	ence / FB15	
Suitable for other cours	es		yes				
Times offered			sem	ester	inter sen	nester, summe	r
Duration			4 we				
Person in charge				Torfi Sigurds gram director		Manfred Köss	sl
Confirmation of comple	etion						
Participation			Reg	ular participa	tion		
Course assessment			expe	minar talk on eriments, 1 se lications, wor	minar tal	ts of one's ow k on current	n
Teaching forms			Prac	tical, self-stu	dy		
			Eng	lish			
Tuition language							
Module exam				n / duration /	content (i	f applicable)	
	xam			n / duration / ded protocol	content (i	f applicable)	
Module exam Module completion of Electrophysiologic recordings in free	cal Teaching	g forms SV			2	f applicable)	4
Module exam Module completion of Electrophysiologi recordings in free behaving animals	cal Teaching		Grad WH CP	ded protocol Semester			4
Module exam Module completion of Electrophysiologic recordings in free	cal Teaching		Grad WH CP	ded protocol Semester	2		4

Anditow Frant'	Gestörte		ective modu	le	11 CP (insg	.) = 330 h		11 SWH	
and Dysfunction: Behavior and	Hören: Vo	ungen und			Contact stu 11 SWH / 1	-	Self-study 165 h	SWH	
Content		I							
The practical teacher be used to determined hearing loss. The fill comparison to norm study design, animad data analysis. The fill determine the effect projects under super measuring and analy function, and statist project. After complation a further seminar ta hearing. Objectives Familiarity with carr behavioral data, statist recording in minimation signal processing, ar about the usage and Requirements for particing none	e effects of ocus is of al functio il handlin behaviora s of dysf ervision a yzing beh ical evalu etion, the alk the st rying out istical ana lly invasi nd graphic <u>limitation</u> pating	of pharmacologi n behavioral to ns. All steps th g, control of ex l analysis is pa unction and tree nd present the avioral data, pe uation methods. individual proj udents will pre well controlled lysis). Performing ve preparations. cal display. Deri	ical or beha echniques at are neces xperimental aralleled by atments at ir results i erforming e Preparatio ects will be sent an ori behavioral ing physiole . Additiona iving scient	vioral t suitable ssary for paramo y basic the phy n the f fficient n of a p present ginal p experim- ogical n l aspects ific que:	reatments of s to characterin r a project in eters, pharma electrophysio siological lev form of a set physiological potential public ed and discuss iece of resear- ments (animal line assurements s are: introductions from th	sensory dia ize the dia cological m elogical m el. The str minar talk l experime ication wi ssed in the rch from t handling, n including	sorders such as sorder rather p re taught in th treatment of a easurements n udents work or the main f ents to determine the the final form of a sem the area of co measuring and electrophysiolo tware for data	s tinnitus o precisely in is practical nimals, and eccessary to n their own occuses are ne auditory part of the inar talk. In gnition and analyzing ogical handling,	
Assignment of module (co	ourse/depa								
	T	rtment)		Inter	disciplinary 1	Neuroscier	nce / FB15		
Suitable for other courses	5	irtment)		Inter yes	disciplinary l	Neuroscier	nce / FB15		
	8	artment)		yes	rdisciplinary l e a year, sumi				
Times offered	8	rtment)		yes	e a year, sum				
Times offered Duration	5	irtment)		yes Onc 6 we	e a year, sum	mer semes			
Times offered Duration Person in charge	-	urtment)		yes Onc 6 we	e a year, sum eeks	mer semes			
Duration Person in charge Confirmation of completi	-	irtment)		yes Onc 6 we PD	e a year, sum eeks Dr. Bernhard	mer semes Gaese			
Times offered Duration Person in charge	-	irtment)		yes Onc 6 we PD I Reg 1 set expe	e a year, sum eeks Dr. Bernhard ular participat minar present eriments, 1 see	mer semes Gaese tion ation on the minar pres	ter e results of on entation on rec		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment	-	urtment)		yes Onc 6 wo PD 1 Reg 1 set expo scient	e a year, sum eeks Dr. Bernhard ular participat minar present	mer semes Gaese ion ation on th minar pres work repo	ter e results of on entation on rec		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms	-	irtment)		yes Onc 6 wo PD 1 Reg 1 set expo scient	e a year, sum eeks Dr. Bernhard ular participat minar present eriments, 1 se atific papers, tical, self-stud	mer semes Gaese ion ation on th minar pres work repo	ter e results of on entation on rec		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language	-	urtment)		yes Onc 6 wo PD 1 Reg 1 set expo scien Prac Eng	e a year, sum eeks Dr. Bernhard ular participat minar present eriments, 1 se atific papers, tical, self-stud	mer semes Gaese ion ation on th minar pres work report dy	ter te results of on entation on rec rt		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language	on	irtment)		yes Onc 6 we PD 1 Reg 1 set expe sciet Prac Eng For	e a year, sum eeks Dr. Bernhard ular participat minar present criments, 1 sen ntific papers, tical, self-stud lish	mer semes Gaese ion ation on th minar pres work report dy	ter te results of on entation on rec rt		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam	on		SWH	yes Onc 6 we PD 1 Reg 1 set expe scien Prac Eng Forr Grad	e a year, sum eeks Dr. Bernhard ular participat minar present criments, 1 sen ntific papers, tical, self-stud lish n / duratiom/ o	mer semes Gaese ion ation on th minar pres work report dy	ter te results of on entation on rec rt		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam	on	Teaching forms	SWH	yes Onc 6 we PD 1 Reg 1 set expe sciet Prac Eng For	e a year, sum eeks Dr. Bernhard ular participat minar present criments, 1 sen ntific papers, tical, self-stud lish n / duratiom/ of	mer semes Gaese ion ation on th minar pres work report dy	ter te results of on entation on rec rt		
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Auditory Function Dysfunction: Behav	am		SWH 11	yes Onc 6 we PD 1 Reg 1 set expe scien Prac Eng Forr Grad	e a year, sum eeks Dr. Bernhard ular participat minar present criments, 1 sen ntific papers, tical, self-stud lish n / duratiom/ ded protocol	mer semes Gaese ion ation on the minar pres work repordy content (if a 2	ter e results of on entation on rec rt applicable)	cent	
Times offered Duration Person in charge Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion ex Auditory Function	am	Teaching forms		yes Onc 6 we PD 1 Reg 1 ser expe scien Prac Eng Grad	e a year, sum eeks Dr. Bernhard ular participat minar present criments, 1 sen ntific papers, tical, self-stud lish n / duratiom/ ded protocol	mer semes Gaese ion ation on the minar pres work repo dy content (if s	ter e results of on entation on rec rt applicable)	cent	

		verarbeitung	Elective mo	dule	11 CP (in	(sg.) = 33	0 h	11
Information in Processing in the Central Auditory System	m Zentralen	Hörsystem			Contact s 11 SWH		Self-study 165 h	- SWH
Content								
The practical co processing of sen cell techniques in analyzed with the aspects (e.g. com under supervision measuring and an The following an data sets and stati of the project Afte seminar talk. In a area of cognition a	sory inform n rodents in e goal to un text-depend n and present nalyzing neu nalyzing neu nalysis inclu istical evalu er completion n further ser and hearing	nation in the audition in the audition in the awake and inderstand behave ence) are taken ent their results in their results in their results modern tect ation methods. The individuation in talk the states	litory domai anesthetized ioral response into accounts in the form different co- chniques of s Preparation of al projects word udents will p	n. The d prep ses font. The n of configu- signal of a po- ill be preser	e focus is parations. I bllowing au ne students a seminar urations of processing otential pu presented nt an origin	on elect Brain ac aditory s work of talk. T in-vivo g, efficion blication and disc nal piece	rophysiologi tivity is acq stimulation. On their owr The main for recording te ent handling n will be the ussed in the e of research	cal single uired and Cognitive a projects cuses are chniques. of larger final part form of a from the
Familiarity with c analyzing electric and histological st for data handling, influences on sens Deriving scientifi Requirements for par none	al activity a taining tech signal proc sory inform c questions	t the single neur niques. Basic in essing, statistica ation processing	con level. Controduction to al analysis an g as an impor	mbini beha d graj	ng physiol vioral cont phical disp	ogy with rol. Intro lay. Unc	n neuroanato oduction to s lerstanding c	mical oftware ognitive
Helpful previous know	wledge:							
none								
Assignment of module	e (course/dep	partment)		Inte	erdisciplina	ary Neur	oscience / Fl	315
Suitable for other cou	· · ·	,		yes	-	•		
Times offered				One	ce a year, s	ummer	semester	
Duration				6 w	veeks			
Person in charge				PD	Dr. Bernh	ard Gaes	se	
Confirmation of comp	oletion			-				
Participation				Reg	gular partic	ipation		
Course assessment	t			1 se one pres	eminar pre e's own exp	sentation periment	n on the results, 1 seminar scientific pa	
Teaching forms					ctical, self	-study		
Tuition language				_	glish	2		
Module exam					-	om/ conte	ent (if applica	ble)
Module completion	n exam				ided protoc			
		Teaching forms	SWH	СР	Semester			
		reaching forms	зип	υr	1	2	3	4
				11				
Information Pro the Central Audi System		P, SeStu	11	11		x		
the Central Audi		P, SeStu	11	11		x		

	Neuronale	Elective module		le	11 CP (insg	.) = 330 h		11
acoustic a communication in I	Grundlagen der akustischen Kommunikation bei Säugetieren				Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content					1			I
The main goal of thi The course is desig consequently subdivi mammalian species tools, the students wi with the receiver. In located in the auditor behaviorally relevant provide the students experiments. An intro- in the form of a scien	gned from the pe ided into two parts. (Mongolian gerbils ill try to figure out to this part, the stude ry cortex. The main t sound. At the begin with the necessary roduction to statistic	rspectiv The finance and base the voca nts will n aim h finning of theore cs and t	ve of the rst part is ats) while al alphabo l learn ho ere is to a of each co etical bac to MATL.	e "broad meant f e they ar et of bats w the ge assess w ourse par kground AB will	deaster-receive for understan re communice s and gerbils. erbil's voice that happens rt, there will for conduct also be offer	ver" appr ding the s ating. Ba The seco is process in the bra be introdu ing and v red. The	oach, and the sounds broadca sically, using b nd part of the o ed in the brain in when an ani actory discussion understanding t final report wil	refore it i sted by two bioacoustic course deal by neuron mal hears ons that will he differen
Objectives By the end of the cou sound as a mechanica cards. (2) Measure ba required for acquiring field potential, recept basic statistical tests	al wave, sound tran asic parameters of a g neuronal data. (4) tive field, brain topo	sduction sound Unders ography	n using m wave (fre stand basi y, spike cl	icropho equency, c neuros ustering	nes, analog-to duration, int science conce , brain oscilla	o-digital c ensity). (2 epts such a ations. (5)	conversion usin 8) Perform basi as: action poter Testing hypot	g sound c surgeries ttial, local nesis using
	· · ·			1				//
Requirements for particip	Jating							
none	Jating							
none Helpful previous knowled none	ge:			Inter	disciplinary 1	Neuroscie	nce / FB15	
none Helpful previous knowled none	ge: urse/department)			Inter	disciplinary 1	Neuroscie	nce / FB15	
none Helpful previous knowled none Assignment of module (co Suitable for other courses	ge: urse/department)			yes	disciplinary l e a year, sumi			
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered	ge: urse/department)			yes	e a year, sum			
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration	ge: urse/department)			yes Once 5 we	e a year, sum eks ulio Hechava	mer seme:		l (program
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion	ge: urse/department)			yes Once 5 we Dr. J direc	e a year, sumi eks ulio Hechava tor)	mer seme: nrria /Prof	ster	l (program
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation	ge: urse/department)			yes Once 5 we Dr. J direc Regu	e a year, summ eks ulio Hechava tor)	mer seme: nrria /Prof	ster . Manfred Köss	
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion	ge: urse/department)			yes Once 5 we Dr. J direc Regu 1 sen exper	e a year, sumi eks ulio Hechava tor) ilar participat ninar present riments, 1 ser	mer seme: arria /Prof tion ation on t minar pre	ster Manfred Köss he results of on sentation on rec	e's own
none Helpful previous knowledge none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment	ge: urse/department)			yes Once 5 we Dr. J direc Regu 1 sen exper scien	e a year, summ eks ulio Hechava tor) tlar participat ninar present	mer seme nrria /Prof ion ation on t minar pre work repo	ster Manfred Köss he results of on sentation on rec	e's own
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms	ge: urse/department)			yes Once 5 we Dr. J direc Regu 1 sen exper scien	e a year, sumi eks ulio Hechava tor) ilar participat ninar present riments, 1 set tific papers, tical, self-stu	mer seme nrria /Prof ion ation on t minar pre work repo	ster Manfred Köss he results of on sentation on rec	e's own
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms Tuition language	ge: urse/department)			yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form	e a year, sum eks ulio Hechava tor) llar participat ninar present riments, 1 sen tific papers, tical, self-stud ish	mer seme nrria /Prof ion ation on t minar pre work repo	ster Manfred Köss he results of on sentation on rec ort	e's own
none Helpful previous knowled none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation	ge: urse/department)			yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form	e a year, sum eks ulio Hechava tor) ilar participat ninar present riments, 1 se tific papers, tical, self-stud ish	mer seme nrria /Prof ion ation on t minar pre work repo	ster Manfred Köss he results of on sentation on rec ort	e's own
none Helpful previous knowledge none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms Tuition language Module exam	ge: ourse/department)	forms	SWH	yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form	e a year, sum eks ulio Hechava tor) llar participat ninar present riments, 1 sen tific papers, tical, self-stud ish	mer seme: urria /Prof ion ation on t minar pre work repo dy content (if	ster Manfred Köss he results of on sentation on rec ort	e's own cent
none Helpful previous knowledge none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms Tuition language Module exam Module completion exa	ge: urse/department)	forms		yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form Grad	e a year, summ eks ulio Hechava tor) ular participat ninar present riments, 1 sen tific papers, tical, self-stud ish h / duratiom/ of	mer seme nrria /Prof ion ation on t minar pre work repo	ster Manfred Köss he results of on sentation on rec ort	e's own
none Helpful previous knowledge none Assignment of module (construction Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms Tuition language Module exam Module completion exa Neuronal basis of ac communication in	ge: urse/department)	forms	SWH 11	yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form Grad	e a year, sum eks ulio Hechava tor) llar participat ninar present riments, 1 sen tific papers, tical, self-stud ish h / duratiom/ d led protocol	mer seme: nrria /Prof cion ation on t minar pre work repo dy content (if	ster Manfred Köss he results of on sentation on recort applicable)	e's own cent
none Helpful previous knowledge none Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Teaching forms Tuition language Module exam Module completion exa Neuronal basis of action	ge: urse/department)	forms		yes Once 5 we Dr. J direc Regu 1 sen exper scien Pract Engli Form Grad	e a year, sum eks ulio Hechava tor) llar participat ninar present riments, 1 sen tific papers, tical, self-stud ish h / duratiom/ d led protocol	mer seme: urria /Prof ion ation on t minar pre work repo dy content (if	ster Manfred Köss he results of on sentation on recort applicable)	e's own cent

	mouse and zebrafish orm of a seminar talk. By writing a result pro- vided in two units. brain tissue for immu- ence microscopy, cor- estern blotting. In the using methods in mo- v as well as zebrafish chniques for studying lured cells under ster vill be trained in zebr ata and images. The s- ults in English.	The studer In a second otocol, they The first pa nohistocher focal micro second part olecular bio embryo mar cellular, mo rile conditio afish embry	nts work seminar will lear rt inclue nistry, b scopy, a of the p ogy and ipulatio	t on their own r talk they pre- r how to write des the follow pasic techniquand biochemic ractical course histological n and basic b and systemic the epifluore ng and basic	e area of n projects esent an o te scientif wing task ues of wor ical techn se, the stud technique ehavioral	s under superv original publica fic reports. (s: basic moust rking with neu- niques includin dents will be i es, confocal m tests. (blogy (as detai icroscope and chniques, and t and learn how	vision and ation from se genetic uronal cel ng proteir introduced nicroscopy led the stereou
The practical course offer systemic neurobiology in present the results in the for the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If The practical course is different to the field of their projects. If Objectives Students learn the basic term to basic term above). They work with complexity of the students of and analyse the obtained different to the communicate their rese Requirements for participating none Helpful previous knowledge: none Assignment of module (course/of Suitable for other courses	mouse and zebrafish orm of a seminar talk. By writing a result pro- vided in two units. brain tissue for immu- ence microscopy, cor- estern blotting. In the using methods in mo- v as well as zebrafish chniques for studying litured cells under ster will be trained in zebr ata and images. The s- ults in English.	The studer In a second otocol, they The first pa nohistocher focal micro second part olecular bio embryo mar cellular, mo rile conditio afish embry	nts work seminar will lear rt inclue nistry, b scopy, a of the p ogy and ipulatio	t on their own r talk they pro- r talk they pro- r how to write des the follow pasic techniquand biochemi- ractical course histological n and basic b and systemic the epifluore ng and basic	n projects esent an o te scientif wing task ues of won ical techn se, the stud technique ehavioral e neurobio escence mi genetic te vironment	s under superv original publica fic reports. (s: basic moust rking with neu- niques includin dents will be i es, confocal m tests. (blogy (as detai icroscope and chniques, and t and learn how	vision and ation from se genetic uronal cel ng protein introduced nicroscopy led the stereo l quantify
systemic neurobiology in present the results in the for the field of their projects. If The practical course is different techniques, processing of cultures, immunofluoresce gel electrophoresis and We to basic zebrafish genetics and brightfield microscopy Objectives Students learn the basic tech above). They work with cumicroscope. The students and analyse the obtained did and communicate their res Requirements for participating none Helpful previous knowledge: none Assignment of module (course/of	mouse and zebrafish orm of a seminar talk. By writing a result pro- vided in two units. brain tissue for immu- ence microscopy, cor- estern blotting. In the using methods in mo- v as well as zebrafish chniques for studying litured cells under ster will be trained in zebr ata and images. The s- ults in English.	The studer In a second otocol, they The first pa nohistocher focal micro second part olecular bio embryo mar cellular, mo rile conditio afish embry	nts work seminar will lear rt inclue nistry, b scopy, a of the p ogy and ipulatio	t on their own r talk they pro- r talk they pro- r how to write des the follow pasic techniquand biochemi- ractical course histological n and basic b and systemic the epifluore ng and basic	n projects esent an o te scientif wing task ues of won ical techn se, the stud technique ehavioral e neurobio escence mi genetic te vironment	s under superv original publica fic reports. (s: basic moust rking with neu- niques includin dents will be i es, confocal m tests. (blogy (as detai icroscope and chniques, and t and learn how	vision and ation from se geneti- uronal cel ng protein introduced nicroscop led the stereo l quantify
Students learn the basic ted above). They work with cumicroscope. The students wand analyse the obtained dand communicate their ress Requirements for participating none Helpful previous knowledge: none Assignment of module (course/of Suitable for other courses	Itured cells under ste will be trained in zebr ata and images. The s ults in English.	rile conditio afish embry	ns, with o handli in an int	the epifluore ng and basic ernational en	scence mi genetic te vironment	icroscope and echniques, and t and learn ho	the stere quantify
Students learn the basic ted above). They work with cumicroscope. The students wand analyse the obtained dand communicate their res Requirements for participating none Helpful previous knowledge: none Assignment of module (courses	Itured cells under ste will be trained in zebr ata and images. The s ults in English.	rile conditio afish embry	ns, with o handli in an int	the epifluore ng and basic ernational en	scence mi genetic te vironment	icroscope and echniques, and t and learn ho	the stere
Helpful previous knowledge: none Assignment of module (course/o Suitable for other courses	lepartment)		Inter	disciplinary 1	Neuroscie	ence / FB15	
none Assignment of module (course/ Suitable for other courses	lepartment)		Inter	disciplinary 1	Neuroscie	ence / FB15	
none Assignment of module (course/c Suitable for other courses	lepartment)		Inter	disciplinary N	Neuroscie	ence / FB15	
Suitable for other courses	lepartment)		Inter	disciplinary N	Neuroscie	ence / FB15	
Suitable for other courses	lepartment)		Inter	disciplinary f	Neuroscie	ence / FBIS	
			1100				
Times offered			yes			mastar	
Dates				e per year; su	mmer sen	nester	
Duration			4 we		D-1	er, Bettina Kiro	-1
Person in charge			PTOL	. Amparo Aci	ker-Paime	er, bettina Kir	chinaler,
Confirmation of completion Participation			Dom	ılar participat	tion		
Course assessment			-	1 1		s of one's own	n
course assessment				riments, 1 sei			u
			publ	ications, worl	k report		
Teaching forms				tical, self-stud	dy		
Tuition language			Engl				
Module exam				n / duration / c	content (if	applicable)	
Module completion exam			Grac	led protocol			
Cellular, molecular and	Traching	CWIT	CP	Semester			
systemic Neurobiology in	Teaching forms	SWH	CP	1	2	3	4
mouse and zebrafish							
Practical	P, SeStu	11	11				
Module exam Sum		1	1	1 1	Х		

INS A-22	Optogenetik und Cal		Elective	11 CP (insg	= 330 h		11
Optogenetics and calcium recordings in freely behaving animals	Messungen in sich fr verhaltenden Tieren	ei	module	Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content							·
The aim of this practical m freely behaving animals p for viral injections and op experiments in freely beha fiber photometry; and ho manipulations and calcium perform behavioral tasks s the results of the experimen	erforming behaviora otical fiber implanta aving animals; how ow to analyze calci recordings will mai uch as reward learni	l tasks. T tions; ho to perfor um sign nly be pe	The stude w to per rm calciu als in re erformed	nts will lear form behavi m recording elation to an in the midbr	n how to oral tasks is in freel nimal's b ain dopar	perform chroni s; how to run o ly behaving ani behavior. The o nine system wh	c surgerie optogeneti mals using optogeneti ile animal
Objectives							
The students will learn the							
experiments in freely beha	ving animals. They v	vill learn	how to d	esign experii	ments to t	est specific hyp	otheses.
Requirements for participating							
none							
Helpful previous knowledge:							
incipial providuo into mouger							
Assignment of module (course/d	epartment)		Interc	lisciplinary I	Neuroscie	ence / FB15	
Suitable for other courses							
Times offered			Once	per year; su	mmer sen	nester	
Duration			4 wee	eks			
Person in charge			Dr. S direct		/Prof. Ma	anfred Kössl (pi	rogram
Confirmation of completion							
Participation			Regu	lar participat	tion		
Course assessment			exper	riments, 1 ser	minar pre	he results of one sentation on rec actical protocol	ent
Teaching forms			Pract	ical, self-stu	dy		
Tuition language			Engli	sh			
Module exam				/ Dauer / ggf	. Inhalt		
Module completion exam				ed protocol			
Optogenetics and calcium	Tratin C	CW/II	CP	Semester			
recordings in freely	Teching forms	SWH	CP	1	2	3	4
behaving animals							
Practical	P, SeStu	11	11				
Module exam					X		
Sum		11	11				

	Celluläre und molekulare	Elective mod	ule	11 CP = 33	80 h		11
molecular n	Aechanismen in Ieurovaskulärer Erkrankungen			Contact str 11 SWH / 1		Self-study 165 h	SWH
Content				1		I	
vascular disorders. T of a seminar talk. T result protocol, they The practical course mouse models. This basic mouse genetic techniques, immunof	offers basic theoretical the students work on their his talk also includes an will learn how to write so consists of systemic, ce includes the following t techniques, processing of fluorescence microscopy	r own projects original publicientific report llular and molechniques: in of brain tissue, confocal mice	under s ication s. ecular a vivo 2-F for imm	supervision a from the fie spects that w Photon Micro nunohistoche	and prese eld of the will be ad oscopy, I emistry, b	nt the results i ir projects. By dressed using mage- and dat pasic primary of	n the form writing a transgenic a analysis, cell culture
Objectives	oresis and Western blotti	ng					
as cellular processes handling and the live Image- and data anal technique as well as cultured cells under s	sorders (as described abo in real time. The student imaging process. The ac ysis skills. The immunol the underlying scientific sterile conditions, with th ment and learn how to w	s are presented quired data w istochemical s question of the e epifluoresce	with th ll be and tainings experin nce – an	e opportunit alyzed by the of brain sec nent. Moreo d stereo mic	y to observe e students etions will over, the s proscope.	rve in vivo ani s, teaching then l teach the students will w The students a	mal n basic lents the ork with
none	B						
Helpful previous knowled	ge:						
none							
Assignment of module (co	urse/department)		Inter	rdisciplinary	Neurosci	ience / faculty	15
Suitable for other courses							
Times offered			Ann	ually in sum	mer and	winter term	
Duration			4 we	eeks, daily			
Person in charge			_	Jasmin Hefe	ndehl /Pro	of. Kössl (prog	gram
Confirmation of completion	0 n						
Participation			Reg	ular particip	ation		
Course assessment			cove		erimental	sentation (15 - l results and a rature.	
Teaching forms			Prac	tical, self-st	udy		
Tuition language			Eng	lish			
Module exam			Forr	n / duration /	/ content (if applicable)	
Module completion exa	am		Grad	ded protocol			
Cellular and molecu mechanisms in Alzh Disease and stroke	neimer's		СР	Semester 1	2	3	4
Practical	P, SeStu	11	11				
		1					
Module exam Sum		11	11	X	Х		

INS A-24		Elective	e module	11 CP = 33	60 h		11 SWII
activity during H natural behaviour in d	Dekodierung von Hirnaktivität während les natürlichen Zerhaltens in Echtzeit			Contact str 11 SWH / 3		Self-study 165 h	SWH
Content							
attention are often re focused on how each neuronal activity rep or varies across spe trained to do natural populations in their Depending on when	e good at multitasking presented in the same l of these processes affer resents such cognitive p cies. For this, we condisite foraging tasks in a visual system. Since the you come, you get e ophysics, virtual reality	brain areas cts neuron processes s luct parall virtual er ne lab is s experience	at the sam al activity in imultaneous el experime avironment, till in the b in mouse/n	e time. Previ a isolation. In ly, and wheth nts in monko while we rec uild-up phase nonkey hand	ious resea contrast, ner this is eys and n cord the a e, what y ling and	rch has overw in our lab we evolutionarily nice. These a ctivity of larg ou would do	helmingly study how preserved nimals are e neuronal is various.
Objectives							
handling of animals surgeries to implant of their task. In addition their own data analysis	le the students will get of (mice and/or monkeys electrodes, and electroph n, the students can do s sis project, which will a ronment and learn how t	s), training hysiologica some psychillow them	the animal recordings ophysics of to learn Ma	s on a natur s from these e n human sub atlab/Python	al task in electrodes jects in th programm	n a virtual en as the animal ne VR, and the ning. The stud	vironment, s are doing ey will get
Requirements for particip	oating						
Helpful previous knowled	ge:						
none			T.	1 1.	NT 1		1.5
Assignment of module (co	<u> </u>		Inte	erdisciplinary	Neurosci	ience / faculty	15
Suitable for other courses	·		A				
Times offered				nually in sum reeks, daily	mer and	winter term	
Duration					nith / Dr	Marieke Schö	lyingk /
Person in charge						gram director)	
Confirmation of completion	on					,	
Participation			Reg	gular participa	ation		
Course assessment						sentation (15	
				ering the exp		results and a	short
Teaching forms				ctical, self-st		lature.	
Tuition language				glish	- J		
Module exam				m / duration /	content (if applicable)	
Module completion exa	am			ided protocol		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Deciphering brain act during natural behavi real time	ivity our in Teaching for	rms S	WH CP	Semester 1	2	3	4
Practical	P, SeStu	1	1 11				
Module exam				X	X		
		1	1 11	1	1		

Elective Modules Subject Area B: Clinical Neuroscience

	rnal Practical "Klinische					0 h		11
L'Atternar l'acticar		chaften"			Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content								·
The practical provid topical projects under present scientific wo The module can be foreign countries as y	er instructio rk through v offered by	ns and introc writing up an departments	luce the resul appropriate re of the Goeth	ts in the sult prot e univer	e form of a cocol. rsity, from o	seminar t	alk. They lea	arn how to
Objectives								
The students gain kn						ical neuro	sciences. The	y learn
working independent		itic questions	based on rele	vant put	olications.			
Requirements for particip	pating							
Helpful previous knowled	dge:							
none								
Assignment of module (co	ourse/depart	ment)		Inter	disciplinary	Neurosci	ence / FB15	
Suitable for other courses	s							
Times offered				Dep	ending on pr	ovider		
Duration				Dep	ending on pr	ovider		
Person in charge							d of the maste Jeuroscience	r's degree
Confirmation of completi	ion					1 2		
Participation				Regi	ular participa	ation		
Course assessment				mod requ writt	ule are appli est any study en,and talks	ed. If the y proofs, a have to b	vider of the ele provider does working repo e given on bo pical literatur	not ort must be th, results
Teaching forms					tical, self-stu		•	
Tuition language				Dep	ending on pr	ovider		
Module exam					n / duration /			
Module completion ex	am				regulations o ule are appli		vider of the el	ective
							by the provid shows a grade	
External Practical I "Clinical Neuroscie		Teaching form	s SWH	СР	Semester 1	2	3	4
Practical		P, SeStu	11	11	1			+
Module exam		,			- 	x		
Sum			11	11	1			

INS B-1	Altern und	Elective mod	ıle	11 CP = 330 h			11
Ageing and Neurodegeneration	Neurodegeneration			Contact study 11 SWH / 165 I		Self-study 65 h	SWH
Content					•		
Parkinson's and at (Offenfeld, Rotaro molecular genetic profile of mutated Journal Club, and	se introduces basic ana axia. The students are d, etc.), statistical eval mutation tests (tail bio tissue. They work on present the experimen- ough writing up a result	trained in obj uation for pro psy, DNA ex current proje ttal results in	ective m gression traction, cts unde	ethods to measu analyses (ANO quantitative PC r supervision, re	re motor VA, Reg R) and a port on	and behavior pression, etc. analysing the up to date s	our pattern) as well a expression science in a
Objectives							
evaluation. Learnin		gy (fibroblast	s/cell cul	ture, transfectior	ı), molec	ular genetics	/biology
	-						
Helpful previous knowl	edge:						
none							
Assignment of module (course/department)		Inter	disciplinary Neu	roscienc	e / FB15	
Suitable for other cours	es						
Times offered			Twi	ce per year, winte	er semest	ter, summer :	semester
Duration			4 we	eks			
Person in charge			Prof	Georg Auburge	r		
Confirmation of comple	tion						
Participation			Reg	ular participation			
Course assessment			expe	minar presentatio riments, 1 semin ntific papers, wor	ar presei		
Teaching forms			Prac	tical, self-study			
Tuition language			Engl	lish			
Module exam			Form	n / duratiom/ cont	tent (if ap	plicable)	
Module completion e	exam		Grad	led protocol			
Ageing and Neurodegeneration	Teaching fo	rms SWH	СР	Semester 1	2	3	4
Practical	P, SeStu	11	11				
Module exam				x			1

	ology and Schmerzpharmakologie	lective mod	ule	11 CP = 33	0 h		11	
Physiology and Pharmacology of Pain	Schmerzpharmakol	ogie			Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content								
The practical focus purpose, various a pharmacological in under supervision. the end of the pract	animal and cell of tervention, novel t The results will be	culture mo reatment s	odels are a trategies ar	applied re exam	and, by th ined. The st	ne use o udents p	of knock-out erform individ	models or lual studies
The experiments concerning the cells, preparation of								mulation of
Objectives	1		,					
mediators of inflam protocol. Requirements for partic none Helpful previous knowle none	ipating	Iture mode	l, preparing	; one's c	own results i	n the for	m of a talk and	l written
Assignment of module (course/department)			Inter	rdisciplinary	Neurosc	ience / FB15	
Suitable for other course	es							
Times offered				Onc	e per year, si	ummer se	emester	
Duration				4 we	eeks, daily			
Person in charge				Prof	. Dr. Ellen N	liederber	ger	
Confirmation of comple	tion							
Participation				Reg	ular participa	ation		
Course assessment				cove		erimenta	esentation (15 l results and a grature.	
Teaching forms				Prac	tical, self-stu	ıdy		
Tuition language				Engl				
Module exam				Form		content ((if applicable)	
Module completion e	xam			Grac	ded protocol			
Module completion e Physiology and Pharmacology of I	Teach	ing forms	SWH	Grad	ded protocol Semester 1	2	3	4
Physiology and	Teach	C	SWH 11		Semester		3	4
Physiology and Pharmacology of I	Pain Teach	C		СР	Semester	2 X	3	4

	lastizität im	Elective mod	lule	11 CP = 330 h			11 SWH
Hippocampus – N	Iippocampus – Aorphologie, Physiologi nd klinische Relevanz	e		Contact study 11 SWH / 165 h		Self-study 165 h	
Content							
The main topics of re damage or neuronal mechanisms of hipp organotypic slice cul activity, live-cell a pharmacology, and research project, con talk. The accompany	and seminars provide esearch comprise morp l (over-) stimulation, bocampal plasticity a tures of the hippocamp nd fixed tissue ima molecular biology mo duct their own experin- ing seminars will give l consider their relevan	hological and ph cellular networ nd homeostasis, ous. Experimenta ging (confocal ethods. Students nents under supe insights into re	ysiologi k dyna To stu il techni micros will le rvision, levant c	ical responses of mics, as well a udy these proce ques include opt icopy), immuno earn appropriate and present their urrent publication	hippoc s the sses, v ogenet cytocho technio r scient	ampal neuro underlying we use the ic manipulat emistry, par ques within tific work in	molecula molecula model o ion of cel tch-clamp a curren a semina
Objectives							
Students will gain kn	owledge and training i and learn how to work						e, and
none Helpful previous knowled Experimental work in			-			_	
Assignment of module (co	urse/department)		Inter	rdisciplinary Neu	roscier	nce / FB15	
Suitable for other courses			yes				
Times offered				ce per year, winte ester	er seme	ester, summe	er
Duration			4-6	weeks			
Person in charge				Tijana Radic, Dr. mas Deller	Tassil	o Jungenitz,	Prof.
Confirmation of completion)n						
Participation Course assessment			1 set	ular participation minar talk on the minar talk on cur	results		
Teaching forms			repo Prac	tical, self-study			
Tuition language			Eng	· · · ·			
Module exam				n / duration / cont	ent (if •	annlicable)	
Module completion exa	ım			ded protocol or e		· ·	
Plasticity in Hippoc Morphology, Physic and Clinical Releva	nce		СР	Semester 1	2	3	4
Practical	P, SeStu	11	11				
Module exam			11	X			
Sum		11					

INS B-6	Hirnschädigung	Elective mod	ule	11 CP = 33	0 h		11	
Brain Damage and Neuroprotection	Neuroprotektio	n			Contact stu 11 SWH / 1	·	Self-study 165 h	SWH
Content								•
The practical inv neuronal cell line stimuli <i>in vitro</i> , a <i>in vivo</i> , detecting transcriptional str	es), inducing isch ssessing neurona g proteins and oth	hemia <i>in vivo</i> l cell death a her compoun	o in rats, <i>in</i> nd neuroprot ds in the cel	<i>vitro</i> h ection l using	ypoxia/ische by cytokines fluorescence	mia, appl and phan and lase	lication of fur maceuticals <i>ir</i> er scanning m	ther stress <i>vitro</i> and
Objectives								
Familiarity with o knowledge about questions based o	anesthetising and	l surgical app						
Requirements for par	ticipating							
none								
Helpful previous knov	vledge:							
none								
Assignment of module	e (course/departme	ent)		Inte	rdisciplinary	Neurosci	ence / FB15	
Suitable for other cou	rses							
Times offered				Onc	e per year, si	ummer se	mester	
Duration				4 we	eeks			
Person in charge				Prof	. Donat Kög	el, Prof. /	Abdelhaq Ram	i
Confirmation of comp	letion							
Participation				Reg	ular participa	ation		
Course assessmen	t				minar talk or eriments, 1 se		lts of one's ow lk on current	'n
					lications, wo			
Teaching forms				Prac	tical, self-stu	ıdy		
Tuition language				Eng	lish			
Module exam				For	n / duration /	content (i	if applicable)	
Module completion	exam			Gra	ded protocol			
Brain Damage a Neuroprotection		eaching forms	SWH	СР	Semester 1	2	3	4
Practical		, SeStu	11	11		2	3	4
Module exam	1	, 20014				Х		
	1					21		

	Klinische Neuropädiatrie	Elective mod	ule	11 CP = 33	60 h		11
Clinical Paediatric Neurology				Contact st 11 SWH / 2		Self-study 165 h	SWH
Content							
the first year of syndromes and ne	tigates neurological questi life, applied neurophysi urotraumatology. The stu- ent their results in the form apers.	iology in chil dents take par	dren, n t in rele	europaedriat vant investi	tric medi gations, v	icine includin write up an ex	g epilepsy perimental
Objectives							
Familiarity with sta	andard methods in clinical clinical symptoms, learnin						
Requirements for parti	cipating						
none							
Helpful previous knowl	edae.						
Basic knowledge o							
Assignment of module ((course/department)		Inter	disciplinary	Neurosc	ience / FB15	
Suitable for other cours	ses						
Times offered			_	e per year, w	vinter sem	nester	
Duration			4 we				
Person in charge			Prof	Dr. Matthia	as Kieslic	h	
Confirmation of comple	etion						
Participation			-	ular participa			
Course assessment			expe	eriments, 1 se	eminar ta	lts of one's ow lk on current	'n
Teaching forms			-	ications, wo tical, self-stu	_		
Tuition language			Engl		idy		
Module exam			0		content (if applicable)	
Module completion of	exam			led protocol	content (n appneasie)	
Clinical Paediatri Neurology	c Teaching form	ns SWH	СР	Semester 1	2	3	4
Practical	P, SeStu	11	11	1	<u> </u>		· ·
Module exam	1,20200			X			1
wiodule exam							

	Klinisches Neuroimaging	Elective modul	e	11 CP = 330 h		11 SWH
Clinical Neuroimaging				Contact study 11 SWH / 165 h	Self-study 165 h	- SWH
Content						
examining the CNS are used: molecular the skull and spinal to basic neuroradiol	ides an introduction to b 5 (cerebral and spinal) wit resonance tomography (M column, digital cerebral a logical intervention measur actical presents the theore	h neuroradiologi (IRT) of the head nd spinal subtractions res.	ical im d and s ction a	naging procedures. ' spinal column, comp ngiography (DSA)	The following pr puter tomography as well as an intr	ocedures (CT) o oduction
image composites, s	ussing on nuclear resonar sequences and sequence pa e tracking), functional	arameters of MR	T, diff	fusion and perfusion	weighted MRT	imaging
	bile a written protocol of and in the form of a semination		ions c	arried out and pre	sent this along	with the
Objectives						
Familiarity with neurologica	uroanatomy (cerebral/spina al diseases. Learning about as well as assigning them	t indications for	neuror	adiological examina		
Requirements for partic	ipating					
	1					
none						
Helpful previous knowle	dae					
Basic knowledge of						
Assignment of module (c	ourse/denartment)		Inter	disciplinary Neuros	cience / FB15	
Suitable for other course	<u> </u>					
Times offered	<u> </u>			es per year, winter s ster		
Duration			seme		semester, summe	r
D 1 1				veeks	semester, summe	r
Person in charge			4-6 v			r
Person in charge Confirmation of complet	ion		4-6 v	veeks		r
-	ion		4-6 w Prof.	veeks		r
Confirmation of complet	ion		4-6 w Prof. Regu 1 sen exper	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar ta	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment	ion		4-6 w Prof. Regu 1 sen exper publi	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar to cations, work report	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment Teaching forms	ion		4-6 w Prof. Regu 1 sen exper publi Pract	veeks Dr. Joachim Berket lar participation ninar talk on the resp riments, 1 seminar ta cations, work repor- tical, self-study	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment Teaching forms	ion		4-6 v Prof. Regu 1 sen exper publi Pract Engli	veeks Dr. Joachim Berket lar participation ninar talk on the resp riments, 1 seminar ta cations, work repor- tical, self-study	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment Teaching forms Tuition language			4-6 w Prof. Regu 1 sen exper publi Pract Engli Form	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar ta cations, work repor- tical, self-study	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam	xam	15 SWH	4-6 w Prof. Regu 1 sen exper publi Pract Engli Form	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar to cations, work repor- tical, self-study ish / duration / content	feld ults of one's own alk on current	
Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam Module completion exam	xam		4-6 w Prof. Regu 1 sen exper publi Pract Engli Form Grad	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar to cations, work repor- tical, self-study ish / duration / content ed protocol	feld ults of one's own alk on current t (if applicable)	
Confirmation of complet Participation Course assessment Teaching forms Tuition language Module exam Module completion exam Clinical Neuroima	xam ging Teaching form		4-6 w Prof. Regu 1 sen exper publi Pract Engli Form Grad	veeks Dr. Joachim Berket lar participation ninar talk on the rest riments, 1 seminar to cations, work repor- tical, self-study ish / duration / content ed protocol	feld ults of one's own alk on current t (if applicable)	

INS B-9	Klinische Auditorische	Elective mod	ule	11 CP = 330 h		11 SW/II
Clinical Auditory Neuroscience	Neurowissenschaften			Contact study 11 SWH / 165 h	Self-study 165 h	SWH
Content						
assess hearing di emissions, imped recording (BERA cochlear implants	will be shown in different also part of the practical.	speech audiom e eardrum, and shall be demon	etry as differe strated.	well as clinical a ent methods of auc The fitting of imp	pplication of or litory brainstem lantable hearing	toacoustic response aids and
In a further sem stimulation/record appropriate result electrical stimulat	k on their own projects wit inar talk they present an ling of auditory responses t protocol. The main topi tion by means of cochlear c responses of the auditory	original piece They learn ho cs are: psycho implants, inve	of restown to p acoustic stigation	earch from the field resent scientific work measurements of n of different record	ld of neuro-phy ork through writ auditory percep ding techniques	siological ing up an tion with to assess
Objectives						
Familiarity with c	arrying out psycho-acoustic ing how to work on scientif					asics of
Requirements for part	icinating					
parts						
none						
Helpful previous know	ledge:					
none						
Assignment of module	(course/department)		Inter	disciplinary Neuros	cience / FB15	
Suitable for other cour	ses					
Times offered				nes per year, winter	semester, summ	er
Duration			4 we	ester eeks		
Person in charge			_	. Uwe Baumann		
Confirmation of compl	letion					
Participation			Reg	ular participation		
Course assessment			expe	minar talk on the res eriments, 1 seminar t ications, work repor	alk on current	n
Teaching forms				tical, self-study	•	
Tuition language			Engl	lish		
Module exam Module completion	exam			n / duration / content led protocol	(if applicable)	
Clinical Auditory	y Teaching for	ms SWH	СР	Semester 2		
Neuroscience				1 4	3	4
Neuroscience Practical	P, SeStu	11	11		3	4
Neuroscience	P, SeStu	11	11		3	4

	Experimentelle und	Elective mod	ule	11 CP = 330 h		11
Experimental and the Translational Psychiatry the Translational th	ranslationale Psychiatrie			Contact study 11 SWH / 165 h	Self-study 165 h	SWH
Content						
psychiatric disorders participate in include large cohorts of patie behavioural tests rele and histological cha neuroimaging meth magnetoencephalogra Objectives Students will receive psychiatric disorders	ical is to introduce studen from the bench to the b e cell culture techniques ents, the assessment of th evant for psychiatric disc aracterisations are perfo ods, such as function aphy are used to assess at training in a range of mo and design experiments u	edside. The w to functionally e effect of dru orders. After s rmed. There al magnetic perrant neural j lecular and be using the know	ide var v evalua ig targe such ex is als resona process haviour ledge g	iety of translational j ate gene candidates i eted, viral vector targ periments, a variety to the possibility to ince imaging, elec ing and coordination ral techniques commo gained. They will also	projects that studentified from eted or knocko of immunohist gain insight troencephalogra in psychiatric con only used to stud receive basic	idents can studies in ut mice in ochemical into how aphy and lisorders.
hyperactivity disorde	disorders, particularly me er, in a series of seminars					
presentations). Requirements for particip						
none Helpful previous knowled	ge:					
none						
Assignment of module (co	- · ·		Inte	rdisciplinary Neurosc	ience / faculty	16
Suitable for other courses						
Times offered			Twi	ce,winter semester, s	summer semeste	er
Duration			6 we	eeks		
Person in charge			Prof	. David Slattery		
Confirmation of completion	on					
Participation			Reg	ular participation		
Course assessment				minar talk on experin nal article, work repo		lseminar
Teaching forms				tical, self-study		
Tuition language			Eng	lish		
Module exam Module completion exa	am		For	n / duration / content (ded protocol	(if applicable)	
Experimental and Translational Psych	Teaching form	IS SWH	СР	Semester 1 2	3	4
I l'ansiational i sych			1			
Practical	P, SeStu	11	11			
·	P, SeStu	11	11	Х		

-	Neurobiologische humane Zellmodelle	Elective mo	dule	11 CP = 33	30 h		11			
Neurobiological human cell models	Lellmodelle				Self-study 165 h	SWH				
Content										
After attending this p techniques to study methods to study net as fluorescence and p After modification o assays can be adapt	genetic varues of the seneric varues of the seneric se	ariants in hum erentiation and uminescence as n neuronal pro- y and statistica	an neurona to genetical says. genitor cell ally analyze	l cell m y modif ines sev	odels. These y DNA seque eral immuno	e techniq ences usin -histoche	ues include c ng CRISPR/Ca mical and mor	ell culture as9 as wel phologica		
insights into genome Objectives	and transc	riptome analys	15.							
neurons in vitro. Thi together with the stu- human neuronal prog seminars and journal current knowledge al Hyperactivity-Disord Requirements for particip none Helpful previous knowled	dents. At th genitor cell l clubs, also bout underl der or Cond pating	he end of the pr lines as cellula in close collab lying psychiatri	actical expension r model for poration with	rience th psychiat the adu	e students wi ric disorders. lt psychiatry,	ll have th In addition the stude	e know-how to on, within opti ent can expand	o use onal their		
cell culture techniques	ige.									
Assignment of module (co	ourse/depar	tment)		Inte	erdisciplinary	Neurosc	ience / faculty	16		
Suitable for other courses	5									
Times offered				Tw	ice, winter se	mester, s	summer semes	ter		
Duration				6 w	reeks					
Person in charge				Pro	f. Dr. Andrea	s Chioce	hetti			
Confirmation of completi	on									
Participation				Reg	gular particip	ation				
Course assessment				1 se		-	ental results, recent scienti	fic papers,		
Teaching forms				Pra	ctical, self-st	udy				
Tuition language				Eng	glish					
Module exam					m / duration /	-	if applicable)			
Module completion example	am			Gra	ded protocol					
Neurobiological hu models	man cell	Teaching form	s SWH	СР	Semester 1	2	3	4		
Practical		P, SeStu	11	11						
Module exam					X	Х				
Sum			11	11						

Electice Modules Subject Area C: Cognitive and computational neuroscience

	1 Practical"Cognitive und"Cognitivetheoretische				è	11 CP = 33	0 h		11
Module "Cognitive th						Contact stu 11 SWH / 1	1dy 165 h	Self-study 165 h	SWH
Content									
The practical provide students work on ow They learn how to pr The module can be foreign countries as y	n topical esent scier offered b	projects under ntific work thro y departments	instructior ugh writin of the Go	ns and ng up a ethe u	introo in app inivers	luce the rest ropriate rest sity, from o	ults in the ilt protoco	form of a ser l.	ninar talk.
Objectives									
The students gain kno computational model based on relevant pul	ing of neu	robiological qu							
Requirements for particip	oating								
none									
Helpful previous knowled	σe:								
none	50.								
					T .	1 1.	<u>.</u>	/ ED 1 /	
Assignment of module (co		rtment)			Inter	disciplinary	Neuroscie	ence / FB15	
Suitable for other courses	5								
Times offered					-	nding on pr			
Duration					-	ending on pr		0.1	
Person in charge								of the master euroscience	's degree
Confirmation of completi	on								
Participation						lar participa			
Course assessment					modu reque writte	ale are appli est any study en,and talks	ed. If the p y proofs, a have to be	ider of the ele provider does working repo given on bot pical literature	not rt must be h, results
Teaching forms						ical, self-stu			
Tuition language					Depe	ending on pr	ovider		
Module exam Module completion exa	am				The	/ duration / regulations o ile are appli	of the prov	applicable) ider of the ele	ctive
								by the provid hows a graded	
External Practical M "Cognitive and theo Neuroscience"		Teaching forms	s SW	н	СР	Semester 1	2	3	4
Practical		P, SeStu	11		11		1		
Module exam							K		
Sum			11		11				

	elling and Simulation		Elective mod	ıle	11 CP = 330	11 CP = 330 h				
Modelling and Simulation	Simulation				Contact stud 8 SWH / 120		Self-study 210 h	SWH		
Content	•									
This module is a "Informatics", F course (SIM1-M derivatives and constitutive related	aculty 12 (Co IPR). The le integrals, int	mputer Science cture imparts: tegral theorems	and Mathem 1) Introductio	atics). n to vo	It consists of a ector analysis:	a lectur functio	e (SIM1) and ons of several	a practica variables		
a) Finite-differ b) Discretisation								stability		
The practical of	fers compleme	entary programn	ning work to t	he lectı	ıre.					
Objectives										
Familiarity with	the basics of n	nodelling and m	umerical simu	lation						
Requirements for pa	rticipating									
none										
Contents of the 1 programming kn Assignment of modu	owledge						urtment 12 Mat			
Suitable for other co	urses									
Times offered				Onc	e per year, sun	nmer se	mester			
Duration				One	semester					
Person in charge				Prof	f. Gabriel Witt	ım				
Confirmation of com	pletion									
Participation										
rarticipation										
Course assessmen	ıt				gramming task					
Course assessmen Teaching forms	it			Lect	ture, Practical,	self-stu	ıdy			
Course assessmen Teaching forms Tuition language	it			Lect	ture, Practical, mally German,	self-stu , Englis	ıdy h if required			
Course assessmen Teaching forms Tuition language				Lect Norr Forr Oral	ture, Practical, mally German, n / duration / co	self-stu , Englis ontent (i en exan	idy h if required if applicable) n (120 min)to	SIM1,		
Course assessmen Teaching forms Tuition language Module exam	n exam	Teaching forms	SWH	Lect Norr Forr Oral depe	ture, Practical, mally German, n / duration / c l exam or writt	self-stu , Englis ontent (i en exan	idy h if required if applicable) n (120 min)to	SIM1,		
Course assessmen Teaching forms Tuition language Module exam Module completio	n exam	Teaching forms	s SWH	Lect Norr Forr Oral	ture, Practical, mally German, n / duration / c l exam or writt ending on num	self-stu , Englis ontent (i en exan	idy h if required if applicable) n (120 min)to	SIM1,		
Course assessmen Teaching forms Tuition language Module exam Module completion Modelling and for Practical	n exam	P, SeStu	S SWH	Lect Norr Forr Oral depe	ture, Practical, mally German, n / duration / co l exam or writt ending on num Semester	self-stu , Englis ontent (i en exan ber of p	idy h if required if applicable) n (120 min)to participants			
Course assessmen Teaching forms Tuition language Module exam Module completio	n exam	_		Lect Norr Forr Oral depe	ture, Practical, mally German, n / duration / co l exam or writt ending on num Semester	self-stu , Englis ontent (i en exan ber of p	idy h if required if applicable) n (120 min)to participants			

INS C-4	Virtueller Hippocampus -	- Elective mod	ule	11 CP = 330 h		11				
Virtual Hippocampus – Introduction to Computational Neuroscience	Einführung in die Computer-Modellierung neuronaler Systeme			Contact study 11 SWH / 165 h	Self-study 165 h	SWH				
Content						I				
specifically focusin theoretical method dendrites to neuron models that are clo anatomical and bi simulations in bio simulations in morp In the accompanyin	seminars provide an overving on modeling neurons is and approaches used to as and neural circuits. The sely linked to experiment iophysical properties. Cophysically realistic and phologically reconstructed ing seminars, the relevance examples from recent rese	and networks to model the ba aim is to learn s al data, especial omputational (i data-driven m d hippocampal n e of computation	of the rain at standard ly those n silico nodels eurons.	hippocampus. Th different levels, l techniques for b e that involve hipp o) experiments i of the hippocam	ne course is an e ranging from syn uilding, managing pocampal cells wi include large-scal npus as well as	ntry to the napses and , and using th complex e networl single-cel				
	xamples from recent rese	aren papers.								
Objectives										
simulations of neur	work modeling technique ons and networks of neur based on relevant publica	ons, http://www								
Requirements for partic	ipating									
none										
Helpful previous knowle	edge:									
Background in Phy	sics, Mathematics or Info	rmatics								
Assignment of module (course/department)		Inter	rdisciplinary Neur	roscience / FB15					
Suitable for other course	es									
Times offered				ce per year, winte ester	r semester, summ	er				
Duration			4 we							
Person in charge			Prof	Dr. Peter Jedlick	<u>ka</u>					
Confirmation of comple	tion									
Participation			Reg	ular participation						
Course assessment				1 seminar talk on the results of one's own						
				experiments, 1 seminar talk on current publications, work report						
Teaching forms				tical, self-study						
Tuition language			Engl	lish						
Module exam			Form	n / duration / cont	ent (if applicable)					
Module completion e	xam		Grad	led protocol						
Virtual Hinnesson	ipus – Teaching for	rms SWH	СР	Semester						
Virtual Hippocam	Teaching for	IIIS SWH	Cr	1	2 3	4				
Introduction to				1						
Introduction to Computational										
Introduction to Computational Neuroscience	D CoCtru		11							
Introduction to Computational	P, SeStu	11	11							

	Neuronale N	letzwerke	Electi	ve modu	le	11 CP = 330 h		11 SW/II		
Systems Neuroscience – Sensorimotor and cognitive networks						Contact study 11 SWH / 165 h	Self-study 165 h	- SWH		
Content										
The module introduc and sensomotoric p concerning linguistic examined in view techniques. In additio	rocessing. processing of their b on, electroc	A main focus g and motor con ehavioral reac corticographic c	s lies antrol of tions a data are	in the i movem and und raised b	nvestig ents of er use by patie	ation of hemispher the hand. Healthy vo of electric and ma ents during brain oper	ic lateralisation, olunteers and pati agneto-encephalo rations.	mainly ents are graphic		
The students get far neural networks. The carry out behavioral seminars.	e students v	will work on a	specifi	c fMRI	case st	udy in the first week	of the module a	nd then		
Objectives										
Acquisition and anal controls). Learning h							s and/or healthy			
Requirements for particip	oating									
none										
Helpful previous knowled	ge:									
none	-									
Assignment of module (co	ourse/depart	tment)			Inter	disciplinary Neurosci	ence / FB15			
Suitable for other courses	ł									
Times offered					Twic seme	e per year, winter sei ster	nester, summer			
Duration					4 we	eks				
Person in charge					PD D	Dr. Christian Kell				
Confirmation of completion	on									
Participation					Regu	lar participation				
Course assessment					1 seminar talk on the results of one's own experiments, 1 seminar talk on current publications, work report					
Teaching forms					Pract	ical, self-study				
Tuition language					Engli	ish				
Module exam						/ duration / content (if applicable)			
Module completion exa	am					ed protocol				
Systems Neuroscien Sensorimotor and c networks		Teaching form	IS	SWH	СР	Semester 1 2	3	4		
Practical		P, SeStu		11	11					
Module exam						Х				
Sum				11	11					

	Neuroana		Elect	tive modu	le	11 CP (insg	g.) = 330 h		11		
Computational neuroanatomy – quantitative analysis and modeling	Modellier	ung				Contact stu 11 SWH / 1		Self-study 165 h	SWH		
Content			. <u> </u>			1	I				
Based on neuroanat models with a mai quantitative analysis stacks. In their dig principles. For exan using time-lapse ima connectivity and fur models. The modul generation of a scient	in focus s methods gital form nple, we aging seri- nction in le <i>Compu</i>	on dendritic in the com a, measured can observe ies. The mea those circus trational Ne	c and puter geon e and asured its. Tl <i>uroan</i>	axonal to digitis netric pro measure l structur he observ <i>atomy</i> w	interacti e variou operties the form e of den red prin- ill there	ons. We will as anatomic of can be mati- nation of ne drites and as ciples will the	ill use ima component tched to c ural circuit xons then o hen be test	age processin s from micros orresponding ts during deve enables conclu- ted in simple	g tools and scopy image biophysical elopment by usions about quantitative		
Objectives											
The participants will will further learn to selected to match the	generate s	simple mode	els tha	t reprodu							
Requirements for partici	pating										
none											
Helpful previous knowled	lge:										
Programming experi											
Assignment of module (co	ourse/depa	artment)			Inter	disciplinary	Neuroscier	nce / FB15			
Suitable for other courses	5										
Times offered					Twic	e per year, v	vinter seme	ester, summer	semester		
Duration					4 we	eks					
Person in charge					Dr. H direc		ntz/Prof. M	anfred Kössl (program		
Confirmation of completi	ion										
Participation					Regi	ılar participa	tion				
Course assessment					expe	1 seminar presentation on the results of one's own experiments, 1 seminar presentation on recent scientific papers, work report					
Teaching forms						tical, self-stu	1				
Tuition language					Engl	ish					
Module exam						n / Dauer / gg	f. Inhalt				
Module completion ex	am				Grad		(Practical	exam: solving	a		
					CD	Semester					
Computational neuroanatomy – quai analysis and modellin		Teching for	ms	SWH	СР	1	2	3	4		
neuroanatomy – quan analysis and modellin			ms			1	2	3	4		
neuroanatomy – quai		Teching for P, SeStu	ms	SWH 11	11		2 X	3	4		

		Modellierung Elective module			11 CP = 33	e $11 \text{ CP} = 330 \text{ h}$				
Computational Modeling of Neuronal Plasticity	neuronaler I	Plastizität			Contact stu 11 SWH / 1		Self-study 165 h	SWH		
Content										
This lab course offer and the modeling of Computational Neur computational mode The focus is on the The benefits and lim examples from the lin	neuronal p coscience, w els. Particip role of plas nitations of	lasticity mecha which investigat ants implement sticity mechanis computer mode	nisms. The c es the functi and analyze sms, their im ls for unders	ourse is oning of standa pact on tanding	a practical in f the brain at rd neuron m network dyr brain functio	ntroduct t multipl odels ar namics a on are di	ion to central n le levels with t nd network arc and their role i iscussed in the	nethods of he help of hitectures. 1 learning.		
Objectives		interpunts prese		5 m a ta	ik und propu					
Participants learn how mechansisms and lea literature.								rant		
Requirements for particip	pating									
Please consult with ,,		antwortlichen"	regarding pr	erequisit	tes.					
	1									
Helpful previous knowled Programming abilitie Background in a quarknowledge in the are	es in at leas intitative dis	scipline (e.g. Ph	ysics, Mathe	matics,	Computer Sc	cience or				
Programming abilitie Background in a quarknowledge in the are Assignment of module (co	es in at leas intitative dis eas lineare a purse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif	Computer Sc ferential equa	cience or ations, n				
Programming abilitie Background in a qua knowledge in the are	es in at leas intitative dis eas lineare a purse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif	Computer Sc ferential equa	cience or ations, n	umerical meth			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co	es in at leas intitative dis eas lineare a purse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif Inter	Computer Sc ferential equa	eience or ations, n Neurosc	umerical meth-			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co	es in at leas intitative dis eas lineare a purse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, dif tics, dif Inter Twie 4 we	Computer Sc ferential equa disciplinary ce per year, s ceks	vience or ations, n Neurosc	umerical meth-			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered	es in at leas intitative dis eas lineare a purse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, dif tics, dif Inter Twie 4 we	Computer Sc ferential equa disciplinary ce per year, s	vience or ations, n Neurosc	umerical meth-			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration	es in at leas intitative dis eas lineare a ourse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, dif tics, dif Inter Twie 4 we	Computer Sc ferential equa disciplinary ce per year, s ceks	vience or ations, n Neurosc	umerical meth-			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge	es in at leas intitative dis eas lineare a ourse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif Inter Twic 4 we Prof	Computer Sc ferential equa disciplinary ce per year, s ceks	vience or ations, n Neurosc summer s Triesch	umerical meth-			
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion	es in at leas intitative dis eas lineare a ourse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, f tics, dif Inter Twice 4 we Prof Regu 1 ser expe	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar presen rriments, wor	vience or ations, n Neurosc summer s Triesch tion tation or k report	umerical meth eience / FB15 semester	ods.		
Programming abilitie Background in a quark knowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completie Participation	es in at leas intitative dis eas lineare a ourse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif Inter Twid 4 we Prof Regu 1 ser expec	Computer Sc ferential equa disciplinary ce per year, s eeks : Dr. Jochen ular participa minar present riments, wor tical, self-stu	vience or ations, n Neurosc summer s Triesch tion tation or k report	umerical meth eience / FB15 semester	ods.		
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment	es in at leas intitative dis eas lineare a ourse/depart	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, f tics, dif Inter Twice 4 wee Prof Regr 1 ser expe Prace Engl	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar present criments, wor tical, self-stu lish	tion tion tion tation tation tation tation tation tation tation	umerical meth	ods.		
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completio Participation Course assessment Teaching forms Tuition language Module exam	es in at leas antitative dis cas lineare a purse/depart s	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif Inter Twice 4 we Prof Regu 1 ser expe Prac Engl Form	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar presen riments, wor tical, self-stu ish n / duration /	tion tion tion tation tation tation tation tation tation tation	umerical meth eience / FB15 semester	ods.		
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completion Participation Course assessment Teaching forms Tuition language	es in at leas antitative dis cas lineare a purse/depart s	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe	matics, tics, dif Inter Twice 4 we Prof Regu 1 ser expe Prac Engl Form	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar present criments, wor tical, self-stu lish	tion tion tion tation tation tation tation tation tation tation	umerical meth	ods.		
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completio Participation Course assessment Teaching forms Tuition language Module exam	es in at leas intitative dis eas lineare a ourse/depart s ion am deling of	scipline (e.g. Ph Ilgebra, probabi	ysics, Mathe lity and statis	matics, tics, dif Inter Twice 4 we Prof Regu 1 ser expe Prac Engl Form	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar presen riments, wor tical, self-stu ish n / duration /	Triesch tion tation or content (umerical meth	ods.		
Programming abilitie Background in a quark knowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completio Participation Course assessment Teaching forms Tuition language Module exam Module completion exa	es in at leas intitative dis eas lineare a ourse/depart s ion am deling of	scipline (e.g. Philipebra, probabi internet)	ysics, Mathe lity and statis	matics, tics, dif Inter Twice 4 we Prof Regu 1 ser expe Prac Engl Forn Grac	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar present riments, wor tical, self-stu ish n / duration / led protocol Semester	tion tion tion tation tation tation tation tation tation tation	umerical metheric semester	one's own		
Programming abilitie Background in a quarknowledge in the are Assignment of module (co Suitable for other courses Times offered Duration Person in charge Confirmation of completio Participation Course assessment Teaching forms Tuition language Module exam Module completion exa	es in at leas intitative dis eas lineare a purse/depart s ion am deling of	Teaching forms	ysics, Mathe lity and statis	matics, f tics, dif Inter Twide 4 we Prof Regu 1 ser expe Prac Engl Forn Grac	Computer Sc ferential equa disciplinary ce per year, s eeks . Dr. Jochen ular participa minar present riments, wor tical, self-stu ish n / duration / led protocol Semester	Triesch tion tation or tation or tation or k report dy content (umerical metheric semester	one's own		

	chnergestützte	Elect	tive modu	le	11 CP (insg	(.) = 330 h		11		
Computational neural dynamics	ıronale Dynamik				Contact stu 11 SWH / 1		Self-study 165 h	SWH		
Content										
Our aim will be to und rise to complex collect neural network. We with the dynamics emerging on new, open scientific dynamics will therefor teach them how to eval which we will include different connectivity p	tive phenomena s ill use spiking neu g in a given netwo p problems that are e teach students t uate the findings a e in the spiking r	uch as rons i rk. Sp e not p o forn and co	s informa n comput ecifically part of the nulate ow mpare the	tion tra er simu , the stu textboo m mode em to kn	nsmission, os lations and p idents will w ok knowledge els, learn to s nown biologio	scillations en-and-pa rite own c e. The mo- solve or s cal observ	, or wave emer per calculations code and will m dule Computation imulate these m ations. Among	gence in a to predict ostly work onal neural odels, and the effects,		
Objectives	1 . 1 1			.•	• •.		1			
The participants will le Matlab. They will learn research. The student p	n how to distill min rojects will be alig	nimal t	heoretica	l model	s from physic	ological ob	servations and			
Requirements for participat	ing									
none										
Helpful previous knowledge	:									
Previous knowledge in	* *	tics or	informat							
Assignment of module (cour	se/department)			Inter	disciplinary 1	Neuroscie	nce / FB15			
Suitable for other courses				·						
Times offered				_	e per year; s	ummer sei	nester			
Duration				4 we						
Person in charge					Fatjana Tchuı gram director		Prof. Manfred	Kössl		
Confirmation of completion										
Participation				Reg	ular participat	tion				
Course assessment				expe	1 seminar presentation on the results of one's own experiments, 1 seminar presentation on recent scientific papers, work report					
Teaching forms				Prac	tical, self-stu	dy				
Tuition language				Engl						
Module exam Module completion exam	L			Grad		Practical	exam: solving a			
				com	putational pro	oblem)				
	Teching for	ms	SWH	СР	Semester					
Computational neural dynamics	P, SeStu		11	11	1	2	3	4		
Module exam						X				
Sum			11	11		1				

	Modelle d	-	Elect	tive modu	le	11 CP (insg	g.) = 330 h		11
Circuit Development n	Entwicklu 1euronale Schaltkre	er				Contact stu 11 SWH / 1		Self-study 165 h	SWH
Content									
This module will for fields during the development of topog We will examine he activity-dependent sy synaptic plasticity, w properties at the sing Calcium imaging) da neuronal circuits.	elopmen graphy, o ow diffe /naptic p vhich is gle neuro	t of sensory ocular domin prent mecha- lasticity inte more comm n level. The	circui nance nisms ract dr ionly s e stude	ts. The s columns includin uring dev studied, t ents will	tudents orienta g: emer velopment the focu have the	will obtain an tion and dire- gence of di- nt to give rise s will be on e opportunity	n overview ction select verse sing to function the role of to analyz	v of existing mo ctivity in the vi- gle neuron pro- onal circuits. In of the specific e (electrophys	odels of the sual cortex. perties and addition to biophysical iological or
Objectives									
Students will learn to Matlab, or Python), a analysis, computer pr	and analy	ze model re	sults in	n relatior					
Requirements for particip None	oating								
Helpful previous knowled	σο•								
Some programming e informatics).	-		ground	l in a qua		discipline (p			ineering,
Suitable for other courses	uist/ucp/	ar tinent)			Inter	disciplinary	i teuroserei		
Times offered					Twie	e ner vear u	vinter sem	ester, summer s	emester
Duration					4 we		anter sent	ester, summer s	cillester
Person in charge						ulijana Gjorg	gjieva/Prot	f. Manfred Kös	sl (program
Confirmation of completion	on					·			
Participation					Regi	ılar participa	tion		
Course assessment					expe		minar pres	he results of one sentation on rec	
Teaching forms						tical, self-stu	1		
Tuition language					Engl	-	-		
Module exam					Forn	n / Dauer / gg	f. Inhalt		
Module completion exa	am				Grad	led protocol			
		Teching for	ms	SWH	СР	Semester 1	2	3	4
Models for Neural C Development	Circuit	Teching for P, SeStu	ms	SWH 11	СР 11	1		3	4
	Circuit		ms				2 X	3	4

INS C-14	Kognitive Ps		Elective m	odule	11 CP = 33	30 h		11
Cognitive Psychology – Attention, Perception & Memory	Aufmerksam Wahrnehmu Gedächtnis				Contact st 11 SWH /	•	Self-study 165 h	- SWH
Content								•
This practical cours Cognitive Psycholo programming, exec memory. Dependin neurocognitive stuc and/or psychophysi background of the expect the students As part of our wee the opportunity to p write a brief paper (by. In partic cuting and a g on current dies using te ics. At the e projects, as to work inde kly lab collo present their	ular, students t analysing expe ly ongoing pro echniques such end of this pra well as data a ependently, the equium, student work in this in	aking part riments in jects in the as EEG, ctical cour acquisition, various me as will be a nformal set	will be al the area "Scene eye track se the stu data and mbers of ble to lea ting. At	ble to gather as of visual Grammar La king (both st udents will l alysis, and in the lab will arn about oth the end of th	hands-on attention ab", the s ationary nave learn nterpretat be there t ner ongoin the course,	a experience in a, scene perce tudents can pa and mobile E ned about the ion of results. o help where p ng projects and students are of	designing ption, and rticipate ir T glasses) theoretica While we ossible. I will have
Objectives Reading up on theo experimental psych analyses and writin	ology, basics	s of acquisition						
Requirements for partic	*	paper.						
none	ipating							
Helpful previous knowled Basic knowledge in might also be helpfu	Matlab/Pyth			nalyses u	ising R. Lool	king at ou	ır webpage bef	orehand
Assignment of module (c				Inte	erdisciplinary	v Neurosc	ience / FB 15	
Suitable for other course	es -							
Times offered				On	ce per year, v	vinter ser	nester	
Duration				4 w	veeks			
Person in charge				Pro	f. Melissa V	D		
Confirmation of complet	tion							
Participation				Reg	gular particip	ation		
Course assessment				1 c	olloquium tal	k discuss	ing the outcon	ne of the
					-		1 scientific re	port
Teaching forms					ctical, self-st	udy		
Tuition language					glish			
Module exam						/ content ((if applicable)	
Module completion e	xam			Gra	ided paper			
Cognitive Psychol	gv –	T 1' C			Semester			
Attention, Percept		Teaching forms	SWI	CP	1	2	3	4
Memory							-	<u> </u>
Practical		P, SeStu	11	11	_			
Module exam			1			1		
Sum			11	11	Х			

Elective Modules Subject Area D: Applied Aspects of Neuroscience

	Externes Pray		Elect	tive modu	ıle	11 CP = 33	0 h		11			
	Angewandte len Neurowis	Aspekte in ssenschaften"				Contact stu 11 SWH / 1		Self-study 165 h	— SWH			
Content The practical provide students work on ow learn how to present The module can be of foreign countries as Objectives	on projects scientific wo offered by o well as by	under instruction work through we lepartments of external-univer	ons and vriting the Go rsity re	d introdu up an ap bethe uni- esearch f	ice the r ppropria iversity, acilities	results in the te result pro from other	o form of a tocol.	seminar talk. s in Germany	They and			
The students gain kn working independen Requirements for partici	tly on scier						lied neuros	ciences. They	/ learn			
none												
Helpful previous knowled	dge:											
Assignment of module (co	ourse/depai	·tment)			Interdisciplinary Neuroscience / FB15							
Suitable for other course	s											
Times offered						Depending on provider						
Duration					Depending on provider							
Person in charge Confirmation of complet	ion					l of examina se "Interdisc		of the master euroscience	's degree			
Participation	1011				Regi	lar participa	ntion					
Course assessment					The modu reque writte	regulations of ale are appli est any study en,and talks	of the provi ed. If the p y proofs, a have to be	der of the ele rovider does working repo given on bot ical literature	not rt must be h, results			
Teaching forms					Practical, self-study							
Tuition language					-	ending on pr						
Module exam Module completion ex	am				The 1	/ duration / egulations c ile are appli	of the provi	applicable) der of the ele	ctive			
								by the provid nows a graded				
External Practical "Applied Aspects o Neuroscience"		Teaching forms	s	SWH	СР	Semester 1	2	3	4			
Practical		P, SeStu		11	11							
Module exam)	K					
Sum				11	11							

	Verhaltensbi	Elective mo	ective module		11 CP = 330 h			
Behavioral Biology in Zoos	Zoos				Contact st 11 SWH /		Self-study 165 h	SWH
Content								
The module consist Zoology are taught students and then dis serve to solidify the Other topics include programs at the zoo fundamentals, organ methodological appr modern methods of physiological studies video analysis with h	in the semi scussed as a oretical prin e: historical p, animal hu ization and coach to the behaviour s) and imag	inar at the beg group. The ex iciples. The foo development asbandry (nutr structural develop practical com research avail	ginning base cursion to va cus will be of of zoos, zo ition, behav lopment, enc ponents dep lable. They	d on ori nious zo n ecolog oos & c our, enr losure d ends on may ind	iginal work, oos and a res gical, physic onservation, richment, m esign and pl the selected clude labora	which v search into blogical a populati ixed spec anning, e l research atory acti	vill be present ernship in the ' nd ethological on biology & ies exhibits), ducation at the focus, with c vities (micros	ed by the Opel Zoo research breeding veterinary Zoo. The lassical to copic and
The students present they learn to critical students are given d paper they become a methodology, plann students independent Objectives	ly appraise letailed feed acquainted ing, implen tly.	original work a back in terms with the writin nentation, logg	at the 'Opel of content a g of a scien ing and ana	Zoo'. Th nd struc ific pub lysis of	tese presenta ture. By dra lication. Fol	ations wil afting a p llowing a l data wi	l be held in Er rotocol in the detailed briefi ill be complet	nglish and form of a ing on the ed by the
The students acquire husbandry, conserva methodology for the in mind current conc	tion aspects implementa), as well as the tion of behavio	e application oural studies	of mode	ern imaging	technique	s. You will lea	rn
Requirements for particip	pating							
none Helpful previous knowled	ao.							
reprut previous knowled	ige:							
none								
Assignment of module (co	ourse/depart	ment)		Inter	disciplinary	Neurosci	ance / FP15	
Suitable for other courses	5						ence / FD15	
Times offered				yes			ence / PD15	
Duration					e per year, s	ummer se		
					e per year, s eeks	ummer se		
Person in charge				Once 5 we				
Person in charge Confirmation of completi	on			Once 5 we	eeks			
Confirmation of completi	on			Onco 5 we Prof	eeks CDr. Paul D	ierkes		
Person in charge Confirmation of completi Participation Course assessment	on			Once 5 we Prof Regu 1 set expe	eeks C Dr. Paul D ular participa minar preser priments, 1 so	ierkes ation ntation on eminar pr	mester the results of o esentation on r	
Confirmation of completi Participation Course assessment	on			Once 5 we Prof Regu 1 set expe sciet	eeks Dr. Paul D ular participa minar preser criments, 1 so ntific papers	ierkes ation ntation on eminar pr , work rep	mester the results of or esentation on r	
Confirmation of completi Participation Course assessment Teaching forms	on			Onco 5 we Prof Regu 1 set expe sciet Sem	eeks Dr. Paul D ular participa minar preser priments, 1 so ntific papers inar, practic	ierkes ation ntation on eminar pr , work rep	mester the results of o esentation on r	
Confirmation of completi Participation Course assessment Teaching forms Tuition language	on			Onco 5 we Prof Regu 1 ser expe scier Sem Engl	eeks Dr. Paul D ular participa minar preser criments, 1 so ntific papers inar, practic lish	ierkes ation ntation on eminar pr , work rep al, self-sti	mester the results of or esentation on r port udy, excursion	
Confirmation of completi Participation				Onco 5 we Prof Regu 1 seu expe scien Sem Engl Form	eeks Dr. Paul D ular participa minar preser criments, 1 so ntific papers inar, practic lish	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r	
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion exa	am	Tradi A		Onco 5 we Prof Regu 1 ser expe scier Sem Engl Forn Grac	eeks Dr. Paul D ular participa minar preser eriments, 1 so ntific papers inar, practic lish n / duration /	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r port udy, excursion	
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam	am	Teaching forms	SWH	Onco 5 we Prof Regu 1 seu expe scien Sem Engl Form	eeks Dr. Paul D ular participa minar preser eriments, 1 s ntific papers inar, practic lish n / duration / ded protocol	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r port udy, excursion	
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion exa	am	Teaching forms P, SeStu		Onco 5 we Prof Regu 1 ser expe scier Sem Engl Forn Grac	eeks Dr. Paul D ular participa minar preser eriments, 1 so ntific papers inar, practic lish n / duration / ded protocol Semester	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r port udy, excursion if applicable)	recent
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion exi Behavioral Biology	am	-		Onco 5 we Prof Regu 1 seu expe scien Sem Engl Form Grace	eeks Dr. Paul D ular participa minar preser eriments, 1 so ntific papers inar, practic lish n / duration / ded protocol Semester	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r port udy, excursion if applicable)	recent
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion exi Behavioral Biology Practical	am	P, SeStu		Onco 5 we Prof Regu 1 seu expe scien Sem Engl Form Grace	eeks Dr. Paul D ular participa minar preser eriments, 1 so ntific papers inar, practic lish n / duration / ded protocol Semester	ierkes ation ntation on eminar pr , work rep al, self-stu (content (mester the results of or esentation on r port udy, excursion if applicable)	recent
Confirmation of completi Participation Course assessment Teaching forms Tuition language Module exam Module completion exi Behavioral Biology Practical Seminar	am	P, SeStu S		Onco 5 we Prof Regu 1 seu expe scien Sem Engl Form Grace	eeks Dr. Paul D ular participa minar preser eriments, 1 so ntific papers inar, practic lish n / duration / ded protocol Semester	ierkes ation ntation on eminar pr , work rep al, self-stu / content (mester the results of or esentation on r port udy, excursion if applicable)	recent

	dividuelle St	Studien Elective module			11 CP = 330 h		11				
Free-choice Studies					Contact study 11 SWH / 165 h	Self-study 165 h	SWH				
Content											
See description of res	pective mo	dule.									
Modules can originat Biochemistry, Chem Psychology and Sport	istry and ts Sciences	Pharmacy (F (FB 05).	⁵ B 14), Bi	osciences	(FB 15), Philosop	by and History	y (FB 8),				
The module can also industrial placement institution or a compa	or research										
Objectives											
See description of res	pective mo	dule									
Requirements for particip none											
Helpful previous knowled none	ge:										
Assignment of module (co	urse/depart	ment)		Inte	rdisciplinary Neuros	cience / FB15					
Suitable for other courses											
Times offered				-	Depending on provider						
Duration				Dep	Depending on provider						
Person in charge					Head of examination board of the master's degree course "Interdisciplinary Neuroscience						
Confirmation of completion	on										
Participation				-	ular participation						
Course assessment				moo requ writ	regulations of the pr dule are applied. If th uest any study proofs tten, and talks have to won experiments and	e provider does , a working repo) be given on bo	not rt must be th, results				
Teaching forms				self	ctical, Tutorial, Lectu -study	re, Seminar, Exe	cursion,				
Tuition language				-	Depending on provider						
Module exam Module completion exa	ım			The	m / duration / content regulations of the pr dule are applied.		ctive				
				If g	rading is not schedule dule completion exan						
Free-choice studies		Teaching form	s SWI	Г СР	Semester 1 2	3	4				
Practical, Tutorial, Le Seminar, Excursion; S Study		P, SeStu; L, S Ex	5, 11	11	X		<u>т</u>				
Module exam											
Sum			11	11]						