



# Developmental, Neural, and Behavioral Biology

## MSc/PhD Program in Göttingen, Germany



- Cell Biology
- Developmental Mechanisms
- Molecular Neurobiology
- Systems Neurosciences
- Behavioral Ecology
- Animal Cognition

Deadline for your application is May 15<sup>th</sup>  
Start of the program is October 1<sup>st</sup>  
[www.biologie.uni-goettingen.de/msc\\_dnb](http://www.biologie.uni-goettingen.de/msc_dnb)

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN



# Master „Developmental, Neural, and Behavioral Biology“



module	number	structure and options		C/ module	C total
<b>core module</b>	<b>3</b>	lecture + seminar + methods course	choice of 9 different modules	12 C	<b>36 C</b>
<b>profile- module</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• additional core module of DNB</li> <li>• core module of MB</li> <li>• *interdisciplinary courses</li> </ul>		12 C	<b>12 C</b>
<b>key- competence- module(s)</b>		<ul style="list-style-type: none"> <li>• course offer "ZESS"</li> <li>• course offer "DNB, MB or BEE"</li> <li>• course offer "other faculties"</li> </ul>		3-12 C	<b>12 C</b>
<b>advanced- module</b>	<b>1</b>	7 - 9 weeks lab course I		12 C	<b>30 C</b>
	<b>1</b>	7 - 9 weeks lab course II		12 C	
	<b>1</b>	scientific project management		6 C	
	<b>common examination of the advanced modules I, II, III</b>				
<b>Master thesis</b> (26 weeks)					<b>30 C</b>

\* Permission of examination board required

**120 C**

# Core Modules – Fachmodule



## core modules (12 C)

=> 5 week block courses

Developmental and Cell Biology				Neurobiology		Behavioral Biology			Bioinformatics	
M.Bio.303	M.Bio.321	M.Bio.322	M.Bio.370	M.Bio.304	M.Bio.305	M.Bio.306	M.Bio.307	M.Bio.308	M.Bio.310	M.Bio.323
<i>Cell Biology</i>	<i>Current developmental biology</i>	<i>Frontiers in neural development</i>	<del><i>Cellular &amp; molecular immunology</i></del>	<i>Neurobiology 1</i>	<i>Neurobiology 2</i>	<i>Introduction to behavioral biology</i>	<i>Behavioral biology</i>	<i>Social behavior and communication</i>	<i>Systems biology</i>	<i>Introduction to Bayesian Statistics and Information Theory</i>
lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + tutorial + methods course	lecture + methods course	lecture + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + practical training	lecture + seminar + practical training
winter term	winter term	summer term	summer term	winter term	summer term	winter term	summer term	summer term	summer term	winter term

# Blockstruktur Modullage in den Semestern



WiSe 2021/2022

	Block 1	Block 2	Block 3
period	25.10. - 26.11.2021	29.11.2021 - 14.01.2022	17.01. - 18.02.2022
winter term	M.Bio.303: Cellbiology	M.Bio.304: Neurobiology 1	M.Bio.306: Introduction to behavioral biology
	M.Bio.323: Introduction to Bayesian Statistics		M.Bio.321: Current Developmental biology

SoSe 2022

	Block 1	Block 2	Block 3
period	19.04. - 20.05.2022	23.05. - 24.06.2022	27.6. - 29.07.2022
summer term	M.Bio.305: Neurobiology 2	M.Bio.322: Frontiers in Neural Development	M.Bio. 307: Behavioral biology
	M.Bio.370: Cellular and molecular immunology	M.Bio.308: Social behavior and communication	
	**M.Bio.310: Systems biology		

dates can still change, no guarantee on the information provided

\*\* The practical part can be organized individually with advisor, continuous lecture and seminar

Developmental and Cell Biology

Neurobiology

Behavioral Biology

Bioinformatics

# Master „Developmental, Neural, and Behavioral Biology“



module	number	structure and options		C/ module	C total
<b>core module</b>	<b>3</b>	lecture + seminar + methods course	choice of 9 different modules	12 C	<b>36 C</b>
<b>profile- module</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• additional core module of DNB</li> <li>• core module of MB</li> <li>• *interdisciplinary courses</li> </ul>		12 C	<b>12 C</b>
<b>key- competence- module(s)</b>		<ul style="list-style-type: none"> <li>• course offer "ZESS"</li> <li>• course offer "DNB, MB or BEE"</li> <li>• course offer "other faculties"</li> </ul>		3-12 C	<b>12 C</b>
<b>advanced- module</b>	<b>1</b>	7 - 9 weeks lab course I		12 C	<b>30 C</b>
	<b>1</b>	7 - 9 weeks lab course II		12 C	
	<b>1</b>	scientific project management		6 C	
	<b>common examination of the advanced modules I, II, III</b>				
<b>Master thesis</b> (26 weeks)					<b>30 C</b>

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**120 C**

**Profile Module – Profilmodul**

**Key Skills – Kompetenzmodule**



**24 Credits to use freely – Freie Entfaltung**

# Key Skills – Kompetenzmodule



## key competence modules: single components of core modules

(combination with associated core module is not possible)

M.Bio.343	M.Bio.363	M.Bio.392	M.Bio.393	M.Bio.394	M.Bio.395	M.Bio.390	M.Bio.391	M.Bio.344	M.Bio.346	M.Bio.366	M.Bio.347	M.Bio.340
<i>Cell biology</i>		<i>Current Developmental biology</i>		<i>Frontiers in Neural Development</i>		<i>Cellular &amp; molecular immunology</i>		<i>Neurobiology 1</i>	<i>Introduction to behavioral biology</i>		<i>Behavioral biology</i>	<i>Systems biology</i>
lecture + seminar	lecture	lecture + seminar	lecture	lecture + seminar	lecture	lecture + seminar	lecture	lecture	lecture + seminar	lecture	lecture + seminar	lecture + tutorial
6 C	3 C	6 C	3 C	6 C	3 C	6 C	3 C	3 C	6 C	3 C	6 C	3 C
winter term		winter term		summer term		summer term		winter term	winter term		summer term	

## additional key competence modules

M.Bio.348	M.Bio.369	M.Bio.350	M.Bio.356	M.Bio.357	M.Bio.359	M.Bio.360	M.Bio.371	M.Bio.372	M.Bio.373	M.Bio.375	M.Bio.376	M.Bio.374	M.Bio.358
<i>Human genetics</i>		<i>From vision to action</i>	<i>Motor systems</i>		<i>Development and plasticity of the nervous system</i>		<i>Neurological and psychiatric diseases</i>	<i>Matlab in Biopsychology and Neuroscience</i>	<i>Visual Psychophysics - From Theory to Experiment</i>	<i>Neuro-rehabilitation Technologies</i>	<i>Laboratory animal course</i>	<i>Computational modelling and human cooperative behavior</i>	<i>Basic applied statistics</i>
lecture + seminar	lecture	lecture	lecture + seminar	lecture	lecture	seminar	seminar (block course)	lecture + tutorial	lecture + computer-training	lecture + exercises	e-Learning unit	seminar + computer-training (weekend course)	methods course (block course)
6 C	3 C	3 C	6 C	3 C	3 C	3 C	2 C	3 C	3 C	2 C	2 C	3 C	6 C
winter term		winter term	summer term		winter term		summer term	summer term	summer term	winter term	winter term	winter term	summer term

**Profile Module – Profilmodul**

**Key Skills – Kompetenzmodule**



**24 Credits to use freely – Freie Entfaltung**



# Master „Developmental, Neural, and Behavioral Biology“



module	number	structure and options		C/ module	C total
<b>core module</b>	<b>3</b>	lecture + seminar + methods course	choice of 9 different modules	12 C	<b>36 C</b>
<b>profile- module</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• additional core module of DNB</li> <li>• core module of MB</li> <li>• *interdisciplinary courses</li> </ul>		12 C	<b>12 C</b>
<b>key- competence- module(s)</b>		<ul style="list-style-type: none"> <li>• course offer "ZESS"</li> <li>• course offer "DNB, MB or BEE"</li> <li>• course offer "other faculties"</li> </ul>		3-12 C	<b>12 C</b>
<b>advanced- module</b>	<b>1</b>	7 - 9 weeks lab course I		12 C	<b>30 C</b>
	<b>1</b>	7 - 9 weeks lab course II		12 C	
	<b>1</b>	scientific project management		6 C	
	<b>common examination of the advanced modules I, II, III</b>				
<b>Master thesis</b> (26 weeks)					<b>30 C</b>

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**120 C**



# Modules required for specialization



main focus		modules	remarks
Cell and Developmental biology	Core modules	M.Bio.321: Current Developmental biology	M.Bio.321 or M.Bio.322 and either M.Bio.303 or M.Bio.370 are obligatory
		M.Bio.322: Frontiers in Neurodevelopment	
		M.Bio.303: Cell biology	
		M.Bio.370: Cellular and molecular immunology	
	Advanced modules	M.Bio.381: Current developmental biology	Two out of these modules are obligatory
		M.Bio.382: Fontiers of developmental biology	
M.Bio.383: Cell biology			
M.Bio.319: Human genetics			
	M.Bio.380: Cellular and molecular immunology		
Master thesis	in department of one of the completed advanced modules		
Neurobiology	Core modules	M.Bio.304: Neurobiology 1	both modules are obligatory
		M.Bio.305: Neurobiology 2	
	Advanced modules	M.Bio.314: Cellular Neurobiology	Two out of these modules are obligatory
		M.Bio.315: Molecular Neurobiology	
		M.Bio.316: Systemic Neurobiology	
	M.Bio.318: Social behavior, communication and cognition		
Master thesis	in department of one of the two selected advanced modules		
Behavioral biology	Core modules	M.Bio.306: Introduction to behavioral biology	obligatory module
		M.Bio.307: Behavioral biology	one module obligatory, other recommended
		M.Bio.308: Social behavior and communication	
	Advanced modules	M.Bio.316: Systemic Neurobiology	Two out of these modules are obligatory
		M.Bio.317: Population and behavioral biology	
		M.Bio.318: Social behavior, communication and cognition	
Master thesis	in department of one of the two selected advanced modules		

Note: You need a total of 3 core modules for this specialization including at least either M.Bio.321 or M.Bio.322.

# Cell and Developmental Biology



main focus	modules		remarks
Cell and Developmental biology	Core modules	M.Bio.321: Current Developmental biology	M.Bio.321 or M.Bio.322 and either M.Bio.303 or M.Bio.370 are obligatory
		M.Bio.322: Frontiers in Neurodevelopment	
		M.Bio.303: Cell biology	
		M.Bio.370: Cellular and molecular immunology	
	Advanced modules	M.Bio.381: Current developmental biology	Two out of these modules are obligatory
		M.Bio.382: Fontiers of developmental biology	
		M.Bio.383: Cell biology	
		M.Bio.319: Human genetics	
		M.Bio.380: Cellular and molecular immunology	
	Master thesis	in department of one of the completed advanced modules	

# Neurobiology



<b>Neurobiology</b>	<b>Core modules</b>	<a href="#">M.Bio.304: Neurobiology 1</a>	Both modules are obligatory
		<a href="#">M.Bio.305: Neurobiology 2</a>	
	<b>Advanced modules</b>	<a href="#">M.Bio.314: Cellular Neurobiology</a>	Two out of these modules are obligatory
		<a href="#">M.Bio.315: Molecular Neurobiology</a>	
		<a href="#">M.Bio.316: Systemic Neurobiology</a>	
<a href="#">M.Bio.318: Social behavior, communication and cognition</a>			
<b>Master thesis</b>	in department of one of the two selected advanced modules		

# Behavioral Biology



<b>Behavioral biology</b>	<b>Core modules</b>	M.Bio.306: Introduction to behavioral biology	obligatory module
		M.Bio.307: Behavioral biology	one module obligatory, other recommended
		M.Bio.308: Social behavior and communication	
	<b>Advanced modules</b>	M.Bio.316: Systemic Neurobiology	Two out of these modules are obligatory
		M.Bio.317: Population and behavioral biology	
		M.Bio.318: Social behavior, communication and cognition	
	<b>Master thesis</b>	in department of one of the two selected advanced modules	

# Core Modules – Fachmodule

## „From the Cell to Cognition“



### core modules (12 C)

=> 5 week block courses

Developmental and Cell Biology				Neurobiology		Behavioral Biology			Bioinformatics	
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lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + tutorial + methods course	lecture + methods course	lecture + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + methods course	lecture + seminar + practical training	lecture + seminar + practical training
winter term	winter term	summer term	summer term	winter term	summer term	winter term	summer term	summer term	summer term	winter term

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	<b>1</b>	scientific project management		6 C	
	<b>common examination of the advanced modules I, II, III</b>				
<b>Master thesis</b> (26 weeks)					<b>30 C</b>

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**120 C**



# Research institutes

- Johann-Friedrich-Blumenbach-Institute for Zoology and Anthropology
- German Primate Center (DPZ)
- University Medical Center (UKG)
- MPI for Experimental Medicine
- MPI for Biophysical Chemistry
- MPI for Dynamics and Self Organization
- Bernstein Center for Computational Neurosciences (BCCN)
- European Neuroscience Institute (ENI)
- Courant Research Centre  
“Evolution of Social Behaviour”
- Center for Systems Neuroscience (CSN)



# Faculty

## Johann-Friedrich-Blumenbach-Institute for Zoology and Anthropology



### Cellular Neurobiology

Prof. Martin Göpfert

Prof. Ralf Heinrich

### Molecular Neurobiology of Behaviour

Prof. Andre Fiala

### Systems Neurobiology

Prof. Dr. Siegrid Löwel

### Evolutionary Developmental Genetics

Prof. Gregor Bucher

### Developmental Biology

PD Dr. Gerd Vorbrüggen

Prof. Ernst A. Wimmer

### Sociobiology & Anthropology

Prof. Peter Kappeler

### Behavioural Ecology

Prof. Julia Ostner

### Data-driven Analysis of Biological Networks

Prof. Michael Wibral



# Faculty



**Affective Neuroscience and Psychophysiology**

Prof. Annekathrin Schacht

**Georg-Elias-Müller Institut für Psychologie**



**Cognitive Ecology**

Prof. Julia Fischer

**Cognitive Neurosciences**

Prof. Stefan Treue

Prof. Alexander Gail

**Neurobiology of Primates**

Prof. Hansjörg Scherberger

**Stem Cell Biology**

Prof. Rüdiger Behr

**German Primate Center, DPZ**



# Faculty

## **Molecular Oncology**

Prof. Matthias Dobbelstein

## **Human Genetics**

Prof. Bernd Wollnik, Prof: Heidi Hahn

## **Neuro- and Sensory Physiology,**

Prof. Silvio Rizzoli

## **Anatomy and Embryology**

Prof. Christoph Viebahn

## **Anatomy and Cell Biology**

Prof. Jörg Wilting

## **Neurophysiology and Cellular Biophysics**

Prof. Detlev Schild

## **Otolaryngology – InnerEarLab**

Prof. Tobias Moser

## **Cellular and Molecular Immunology**

Prof. Jürgen Wienands

## **Medical Bioinformatics**

Prof. Tim Beissbarth

**University Medical Center**



UNIVERSITÄTSMEDIZIN : UMG  
GÖTTINGEN

# Faculty



## Theoretical Neurophysics

Prof. Fred Wolf

**MPI for Dynamics and Self Organisation and  
Campus Institute for Dynamics of Biological Networks**

## Molecular Neurobiology

Prof. Nils Brose

## Neurogenetics

Prof. Klaus Armin Nave

## Molecular Biology of Neuronal Signals

Prof. Walter Stühmer

## MPI for Experimental Medicine



# Faculty

## Biophysics,

Dr. Dieter Klopfenstein

## Computational Neurosciences

Prof. Florian Wörgötter



## III Physical Institute

## Cellular Logistics

Prof. Dirk Görlich

## Nuclear Architecture

Dr. Volker Cordes

## Meiosis

Dr. Melina Schuh

## Tissue Dynamics and Regeneration

Dr. Jochen Rink

## MPI for Biophysical Chemistry



# Faculty

**Bioinformatics,**  
Prof. Jan de Vries



**Institute of Microbiology and Genetics**

**Epigenetics and Systems Medicine  
in Neurodegenerative Diseases,**  
Dr. André Fischer



**DZNE German Center for Neurodegenerative Diseases**

**Synaptic Vesicle Dynamics,**  
Dr. Ira Milosevic  
**Neural Computation and Behavior,**  
Dr. Jan Clemens

**European Neuroscience Institute Göttingen**



# Bachelor of Science (life science)

## Master / PhD Program: Developmental, Neural, and Behavioral Biology modules

		credits
semester 1	core I 3 weeks lab course & seminar & lecture	12
	core II 3 weeks lab course & seminar & lecture	12
	key skills	6
semester 2	core III 3 weeks lab course & seminar & lecture	12
	advanced I 7 - 9 weeks lab course	12
	key skills	6
semester 3	profile extended selection according to special interest	12
	advanced II 7 - 9 weeks lab course	12
	advanced III	6
semester 4	master thesis 6 months in a research group of the program	30

There is flexibility in the choice of modules in the first three semesters.



career entry

external PhD

PhD  
(direct access  
to GAUSS and  
GGNB)



# Continuing Ph.D. programs



**GAUSS**

**Georg-August-University-School of Science**

**Faculty Ph.D. program, Faculty of Biology and Psychology**

**Behaviour and Cognition**

**GGNB**

**Göttingen Graduate Center**

**for Neurosciences, Biophysics and Molecular Biosciences**

# GGNB



**International Max Planck Research Schools**  
**Physics of Biological and Complex Systems**  
**Genome Science**

**PhD Programs of the Göttingen Center for Molecular Biosciences (GZMB)**  
**Microbiology and Biochemistry**  
**Biomolecules: Structure - Function - Dynamics**  
**Molecular Biology of Cells**  
**Genes and Development**

**PhD Programs of the DFG Research Center Molecular Physiology of the Brain (CMPB)**  
**Molecular Physiology of the Brain**

**PhD Program of the Bernstein Center for Computational Neuroscience (BCCN)**  
**Theoretical and Computational Neuroscience**

**PhD Program of the Medical School**  
**Sensory and Motor Neuroscience**

**PhD Program of the Center for Systems Neuroscience**  
**Systems Neuroscience**

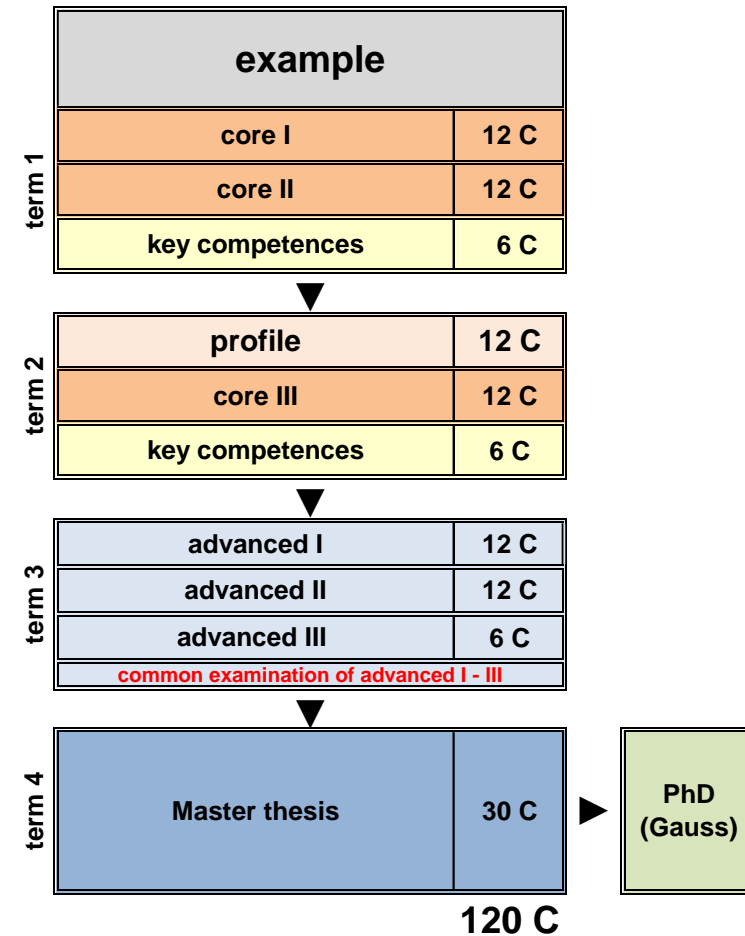
# Master „Developmental, Neural, and Behavioral Biology“



## Basic structure

module	number	structure and options	C/ module	C total	
<b>core module</b>	3	lecture + seminar + methods course	choice of 9 different modules	12 C	36 C
<b>profile-module</b>	1	<ul style="list-style-type: none"> <li>• additional core module of DNB</li> <li>• core module of MB</li> <li>• *interdisciplinary courses</li> </ul>		12 C	12 C
<b>key-competence-module(s)</b>		<ul style="list-style-type: none"> <li>• course offer "ZESS"</li> <li>• course offer "DNB, MB or BEE"</li> <li>• course offer "other faculties"</li> </ul>		3-12 C	12 C
<b>advanced-module</b>	1	7 - 9 weeks lab course I		12 C	30 C
	1	7 - 9 weeks lab course II		12 C	
	1	scientific project management		6 C	
	common examination of the advanced modules I, II, III				
<b>Master thesis</b> (26 weeks)					30 C

## Curriculum



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120 C

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DNB = Master "Developmental, Neural, and Behavioral Biology"

MB = Master "Microbiology and Biochemistry"

BEE = Master "Biodiversity and Ecology"

ZESS = "Zentrale Einrichtung für Sprach- und Schlüsselkompetenzen,, (e.g. language courses)