

CMS-CMA-ELG Computational Mathematics Basics			Responsible Lecturer:	Prof. Dr. Axel Voigt						M1100-CMS31		
Compulsory Module with Electives Catalogue (Setpoint: 8 SWS)												
Eine Lehrveranstaltung des Katalogs CMS-CMA-ELG kann nicht gewählt werden, wenn diese bereits in einem anderen Pflichtmodul mit wahlpflichtigem Inhalt bzw. in einem Wahlpflichtmodul der Grundlagenausbildung im Masterstudiengang Computational Modeling and Simulation gewählt wurde.												
Please note that any course of the catalogue CMS-CMA-ELG cannot be selected if it has been already selected for another CMS-module.												
Die Modulnote ergibt sich aus dem nach Semesterwochenstunden (SWS) gewichteten Durchschnitt der Noten der Prüfungsleistungen. The module grade is the average of the grades of the individual examinations, weighted by course effort (SWS, lecture hours per week).												
Nr.	Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Duration	Weighting according to SWS	Course number Selma	Maximum number of participants
1	Biophysical Methods	CMCB	Michael Schlierf	2V/2S	english	Winter	Michael Schlierf	Oral Presentation		4	K1112-5NB23	
2	Concepts of Molecular Modelling	MW	Rafael Gutierrez	2V/2Ü/2P	english	Winter	Rafael Gutierrez	Written Examination	90 Minuten	6	K1314-EX3006	
3	Digitization and Data Analytics: Architectures, Methods and Consequences	INF	Wolfgang Nagel Sunna Torge	2V/2Ü	english	Summer	Wolfgang Nagel Sunna Torge	Written Examination 90 min/Oral Assessment 20 min <=10 participants		4	K1102-ZIH03	
4	Introduction to Mathematical Biology 1	INF (ZIH)	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 18/19 Winter 20/21	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH001	
5	Introduction to Mathematical Biology 2	INF (ZIH)	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 19/20 Winter 21/22	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH002	
6	Numerics with partial differential equations - Advanced concepts	MATH	Oliver Sander Patrick Jaap	3V/1Ü	german/ english	Summer	Oliver Sander	Oral Assessment (Group) 20 min		4	K0108-40545x	
7	Numerical Mathematics of Partial Differential Equations	MATH	Oliver Sander Patrick Jaap	3V/1Ü	german/ english	Winter	Oliver Sander	Oral Assessment (Group) 20 min		4	K0108-40543x	
8	Principles of Biophysics	CMCB	Michael Schlierf	2V/2Ü	english	Winter	Michael Schlierf	Written Examination	90 Minuten	4	K1112-5MB15b K3012-5MB15bV	
9	Scalable Data Engineering	INF	Dirk Habich Claudio Hartmann	2V/2Ü	english	Winter	Wolfgang Lehner Dirk Habich	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1106-MA0023	
10	Scientific Programming – Advanced Aspects	MATH	Wolfgang Walter Simon Praetorius	3V/1Ü	german/ english	any	Wolfgang Walter Simon Praetorius	Oral Assessment (Group) 20 min		4	K0108-40643x	50
11	Theoretical Biophysics	CMCB	Frank Jülicher Christoph Weber	2V/2Ü	english	Summer	Frank Jülicher Christoph Weber	Oral Assessment	20 Minuten	4	K1112-5NB24	
12	Scientific Working = Advanced Concepts of object-oriented Programming Languages	MATH	Wolfgang Walter	2 SWS Vorlesung 2 SWS Seminar	german/ english	Summer	Wolfgang Walter	ungraded Assignment (must be passed)		4	K0108-40140bV K0108-40140bS	15
13	Scientific Arithmetic - Advanced Aspects	MATH	Axel Voigt Marco Salvalaglio	3V/1Ü	englisch	Summer	Axel Voigt Marco Salvalaglio	Oral Assessment (Group) 20 min		4	K0108-40642x	50

CMS-CMA-FEM Finite Element Methods			Responsible Lecturer:	Prof. Dr. Axel Voigt			M1100-CMS32	
Compulsory Module for Track CMA		PVL: Übungsaufgabe gelöst						
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
Finite Element Method - Theory, Implementation and Applications	MATH	Axel Voigt Dennis Wenzel	3V/1Ü	german/ english	Winter	Axel Voigt Ivo Sbalzarini	Written Examination 120 min/ Oral Assessment 20 min ≤10 participants	K0108-40641x

CMS-CMA-PROJ Computational Mathematics Project			Responsible Lecturer:	Prof. Dr. Axel Voigt					M1100-CMS341
Compulsory Module									PO 2020
Course Title	Faculty	Lecturer	Effort	Language	Semester	Examiner	Examination Performance	Duration of Exam	Course number Selma
Project	MATH	Axel Voigt	2 SWS Seminar 2 SWS Project Handling	german/english	Winter	Voigt	Oral Presentation	20 min	K0108-40645xS
CMS-CMA-PROJ Computational Mathematics Project			Responsible Lecturer:	Prof. Dr. Axel Voigt					M1100-CMS34
Compulsory Module									PO 2018
Course Title	Faculty	Lecturer	Effort	Language	Semester	Examiner	Examination Performance	Duration of Exam	Course number Selma
Project	MATH	Axel Voigt	2 SWS Seminar 60 hours Project Handling	german/english	Winter	Voigt	Un-graded colloquium	20 min	K0108-40645xS

CMS-CMA-ELV1 Computational Mathematics Advanced		Responsible Lecturer:		Prof. Dr. Axel Voigt		M1100-CMS35						
Compulsory Module with Electives Catalogue (Setpoint: 8 SWS)												
Eine Lehrveranstaltung des Katalogs CMS-CMA-ELV1 kann nicht gewählt werden, wenn diese bereits in einem anderen Pflichtmodul mit wahlpflichtigem Inhalt bzw. in einem Wahlpflichtmodul der Grundlagenausbildung im Masterstudiengang Computational Modeling and Simulation gewählt wurde. Please note that any course of the catalogue CMS-CMA-ELV1 cannot be selected if it has been already selected for another CMS-module.												
Die Modulnote ergibt sich aus dem nach Semesterwochenstunden (SWS) gewichteten Durchschnitt der Noten der Prüfungsleistungen. The module grade is the average of the grades of the individual examinations, weighted by course effort (SWS, lecture hours per week).												
Nr.	Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Duration	Weighting according to SWS	Course number Selma	Maximum number of participants
1	Biological Hydrodynamics	CMCB	Stephan Grill Benjamin Friedrich Jan Brugues	2V/2Ü	english	Winter	Benjamin Friedrich	Oral Assessment	20 Minuten	4	K1112-5NB23 K3012-5NB23b	
2	Computational Cell Biology	MED	Ingmar Glauche	2V/2Ü	english	Winter	Ingmar Glauche	Oral Presentation	30 Minuten	4	K9603-11073	15
3	Computational Fluid Dynamics	MW	Jochen Fröhlich Jordi Ventosa Molina	2V/2Ü	english	Winter	Jochen Fröhlich Jordi Ventosa Molina	Written Examination 120 min/Oral Assessment 20 min ≤10 participants		4	K1302-EX3040	
4	Digitization and Data Analytics: Architectures, Methods and Consequences	INF	Wolfgang Nagel Sunna Torge	2V/2Ü	english	Summer	Wolfgang Nagel Sunna Torge	Written Examination 90 min/Oral Assessment 20 min ≤10 participants		4	K1102-ZIH03	
5	Introduction to Mathematical Biology 1	INF	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 18/19 Winter 20/21	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH001	
6	Introduction to Mathematical Biology 2	INF	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 19/20 Winter 21/22	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH002	
7	Molecular Electronics	MW	Gianaurelio Cuniberti Francesca Moresco	2V/2Ü	english	Winter	Gianaurelio Cuniberti Francesca Moresco	Written Examination 90 min/Oral Assessment 20 min ≤10 participants		4	K1314-EX0201	
8	Nanostructured Materials 1	MW	Gianaurelio Cuniberti Bergoi Ibarlucea	2V/2Ü/2P	english	Summer	Cuniberti	1. Written Examination 90 min/Oral Assessment 20 min ≤10 participants 2. Laboratory Protocol		6	K1314-2H0440	
9	Numerics with partial differential equations - Advanced concepts	MATH	Oliver Sander Patrick Jaap	3V/1Ü	german/ english	Summer	Oliver Sander	Oral Assessment (Group) 20 min		4	K0108-40545x	
10	Particle Methods	INF	Ivo Sbalzarini	2V/2Ü	english	Summer	Ivo Sbalzarini	Written Examination 90 min/Oral Assessment 30 min ≤10 participants		4	K1107-MA0006	
11	Scientific Programming – Advanced Aspects	MATH	Wolfgang Walter Simon Praetorius	3V/1Ü	german/ english	any	Wolfgang Walter Simon Praetorius	Oral Assessment (Group) 20 min		4	K0108-40643x	50
12	Scientific Visualization	INF	Stefan Gumhold	2V/2Ü	english	Summer	Stefan Gumhold	Written Examination 90 min/Oral Assessment 20 min ≤15 participants		4	K1104-MA0032	
13	Seminar Mathematical Biology	INF	Andreas Deutsch Lutz Bruschi	2 Seminar	english	Summer	Andreas Deutsch Lutz Bruschi	Oral Presentation	30 Minuten	2	K1102-ZIH001S	
14	Team Project	any	any	8 SWS Projektbearbeitung	english	Summer	after confirmation Examination Committee CMS	1. Written Project Report 70 hr 2. Oral Presentation 30 min		8	K1100-CMS11X	
15	Scientific Working = Advanced Concepts of object-oriented Programming Languages	MATH	Wolfgang Walter	2 SWS Vorlesung 2 SWS Seminar	german/ english	Summer	Wolfgang Walter	ungraded Assignment (must be passed)		4	K0108-40140bV K0108-40140bS	15
16	Scientific Arithmetic - Advanced Aspects	MATH	Axel Voigt Marco Salvalaglio	3V/1Ü	english	Summer	Axel Voigt Marco Salvalaglio	Oral Assessment (Group) 20 min		4	K0108-40642x	50

CMS-CMA-ELV2 Computational Mathematics Applications				Responsible Lecturer:		Prof. Dr. Axel Voigt						M1100-CMS36	
Compulsory Module with Electives Catalogue (Setpoint: 8 SWS)													
Eine Lehrveranstaltung des Katalogs CMS-CMA-ELV2 kann nicht gewählt werden, wenn diese bereits in einem anderen Pflichtmodul mit wahlpflichtigem Inhalt bzw. in einem Wahlpflichtmodul der Grundlagenausbildung im Masterstudiengang Computational Modeling and Simulation gewählt wurde. Please note that any course of the catalogue CMS-CMA-ELV2 cannot be selected if it has been already selected for another CMS-module.													
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nr.	Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Duration	Weighting according to SWS	Course number Selma	Maximum number of participants	
1	Biological Hydrodynamics	CMCB	Stephan Grill Benjamin Friedrich Jan Bruges	2V/2Ü	english	Winter	Benjamin Friedrich	Oral Assessment	20 Minuten	4	K1112-5NB23		
2	Computational Cell Biology	MED	Ingmar Glauche	2V/2Ü	english	Winter	Ingmar Glauche	Oral Presentation	30 Minuten	4	K9603-11073	15	
3	Computational Fluid Dynamics	MW	Jochen Fröhlich Jordi Ventosa Molina	2V/2Ü	english	Winter	Jochen Fröhlich Jordi Ventosa Molina	Written Examination 120 min/Oral Assessment 20 min <=10 participants		4	K1302-EX3040		
4	Digitization and Data Analytics: Architectures, Methods and Consequences	INF	Wolfgang Nagel Sunna Torge	2V/2Ü	english	Summer	Wolfgang Nagel Sunna Torge	Written Examination 90 min/Oral Assessment 20 min <=10 participants		4	K1102-ZIH03		
5	Introduction to Mathematical Biology 1	INF	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 18/19 Winter 20/21	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH001		
6	Introduction to Mathematical Biology 2	INF	Andreas Deutsch Lutz Bruschi	2V/1Ü	english	Winter 19/20 Winter 21/22	Andreas Deutsch Lutz Bruschi	Oral Assessment	30 Minuten	3	K1102-ZIH002		
7	Molecular Electronics	MW	Gianaurelio Cuniberti Francesca Moresco	2V/2Ü	english	Winter	Gianaurelio Cuniberti Francesca Moresco	Written Examination 90 min/Oral Assessment 20 min <=10 participants		4	K1314-EX0201		
8	Nanostructured Materials 1	MW	Gianaurelio Cuniberti Bergoi Ibarlucea	2V/2Ü/2P	english	Summer	Cuniberti	1. Written Examination 90 min/Oral Assessment 20 min <=10 participants 2. Laboratory Protocol		6	K1314-2H0440		
9	Numerics with partial differential equations - Advanced concepts	MATH	Oliver Sander Patrick Jaap	3V/1Ü	german/ english	Summer	Oliver Sander	Oral Assessment (Group) 20 min		4	K0108-40545x		
10	Particle Methods	INF	Ivo Sbalzarini	2V/2Ü	english	Summer	Ivo Sbalzarini	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1107-MA0006		
11	Scientific Programming – Advanced Aspects	MATH	Wolfgang Walter Simon Praetorius	3V/1Ü	german/ english	every	Wolfgang Walter Simon Praetorius	Oral Assessment (Group) 20 min		4	K0108-40643x	50	
12	Scientific Visualization	INF	Stefan Gumhold	2V/2Ü	english	Summer	Stefan Gumhold	Written Examination 90 min/Oral Assessment 20 min <=15 participants		4	K1104-MA0032		
13	Seminar Mathematical Biology	INF	Andreas Deutsch Lutz Bruschi	2 Seminar	english	Summer	Andreas Deutsch Lutz Bruschi	Oral Presentation	30 Minuten	2	K1102-ZIH001S		
14	Team Project	any	any	8 SWS Projektbearbeitung	english	Summer	after confirmation Examination Committee CMS	1. Written Project Report 70 hr 2. Oral Presentation 30 min		8	K1100-CMS11X		
15	Scientific Working = Advanced Concepts of object-oriented Programming Languages	MATH	Wolfgang Walter	2 SWS Vorlesung 2 SWS Seminar	german/ english	Summer	Wolfgang Walter	ungraded Assignment (must be passed)		4	K0108-40140bV K0108-40140bS	15	
16	Scientific Arithmetic - Advanced Aspects	MATH	Axel Voigt Marco Salvalaglio	3V/1Ü	englisch	Sommer	Axel Voigt Marco Salvalaglio	Oral Assessment (Group) 20 min		4	K0108-40642x	50	