

CMS-CE-FEM Engineering Finite Element Methods			Responsible Lecturer:		Prof. Dr. Michael Beitelschmidt		M1100-CMS60	
Compulsory Module		Exam Preparation: Exercise					PO 2020	
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
Finite Element Method - Theory, Implementation and Applications	MATH	Axel Voigt	3V/1Ü	german/ english	Winter	Axel Voigt	Written Examination 120 min/Oral Assessment 20 min <=10 participants	K0108-40641x

CMS-CE-EL1		Computational Engineering Basics		Responsible Lecturer:		Prof. Dr. Michael Beiteltschmidt		M1100-CMS61				
Compulsory Module with Electives Catalogue (Setpoint: 8 SWS)												
Eine Lehrveranstaltung des Katalogs CMS-CE-EL1 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-CE-EL1 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	Notes
1	Antennas	Eul	Dirk Plettemeier	2V/1Ü	german	Summer	Dirk Plettemeier	Oral Assessment		3	K1210-110150	No. 1 and No. 5 shall be taken together
2	Electromechanical Networks	Eul	Uwe Marschner	2V/1Ü	english	Winter	Uwe Marschner	Written Examination	120 min	3	K1212-500060	
3	Numerical Mathematics	Eul	Ralf Theo Jacobs	2V/1Ü	german	Winter	Ralf Theo Jacobs	Written Examination	120 min	3	K1202-100030	
4	Future Computing Strategies in Nano-Electronic Systems	Eul	Alon Ascoli	2V/1Ü	english	Winter	Alon Ascoli	Written Examination 90 min/Oral Assessment 30 min <=5 participants		3	K1208-500170	
5	Propagation	Eul	Dirk Plettemeier	2V/1Ü	german	Summer	Dirk Plettemeier	Oral Assessment		3	K1210-110151	No. 1 and No. 5 shall be taken together
6	Advanced Problem Solving and Search	INF	Lucía Gómez Álvarez Sarah Alice Gaggli	2V/2Ü	english	every	Lucía Gómez Álvarez Sebastian Rudolph	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1107-MA0056	
7	Computer Vision 1	INF	Björn Andres	2V/2Ü	english	Winter	Björn Andres	Oral Assessment	30 min	4	K1107-MA0009	
8	Computer Graphics 1	INF	Stefan Gumhold	2V/2Ü	german/english	Winter	Gumhold	Written Examination 90 min/Oral Assessment 20 min <= 15 participants		4	K1104-MA0025	
9	Data Visualization	INF	Dachselt/Gumhold	2V/2Ü	german/english	Winter	Dachselt Gumhold	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1104-CMS03	
10	Design Patterns and Frameworks	INF	Uwe Aßmann Sebastian Götz	2V/2Ü	english	Winter	Uwe Aßmann Sebastian Götz	Written Examination 90 min/Oral Assessment 15 min <=20 participants		4	K1104-MA0020	
11	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	
12	Knowledge Graphs	INF	Markus Kröttsch Maximilian Marx	2V/2Ü	english	Winter	Markus Kröttsch	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1101-MA0024	
13	Performance Analysis of Computing Systems	INF	Wolfgang Nagel Holger Brunst Robert Schöne	2V/2Ü	english	Winter	Wolfgang Nagel Holger Brunst	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1102-MA0007	
14	Machine Learning 1	INF	Björn Andres	2V/2Ü	english	Winter	Björn Andres	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1107-MA0060	
15	Particle Methods	INF	Ivo Sbalzarini	2V/2Ü	english	Summer	Ivo Sbalzarini	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1107-MA0006	
16	Scalable Data Engineering	INF	Wolfgang Lehner Claudio Hartmann	2V/2Ü	english	Winter	Wolfgang Lehner Dirk Habich	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1106-MA0023	
17	Scientific Visualization	INF	Stefan Gumhold	2V/2Ü	english	Summer	Stefan Gumhold	Written Examination 90 min/Oral Assessment 20 min <= 15 participants		4	K1104-MA0032	

18	Seminar Computer Vision 2	INF	Björn Andres	2 Seminar	english	Summer	Björn Andres	Oral Presentation	30 min	2	K1107-MA0016S	Maximum 30 participants
19	Seminar Machine Learning 2	INF	Björn Andres	2 Seminar	english	Summer	Björn Andres	Oral Presentation	30 min	2	K1107-MA0062S	Maximum 25 participants
20	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	only remaining places
21	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	only remaining places
22	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	
23	Coupled Simulation/Real Time Simulation	MW	Michael Beitelschmidt	2V	english	Winter	Michael Beitelschmidt	Written Examination	90 min	2	K1301-EX0190V	
24	Multi Body Systems	MW	Michael Beitelschmidt Volker Quarz	2 SWS Praktikum	german/ english	every	Michael Beitelschmidt	ungraded Assignment (must be passed)		2	K1301-1H1625P	
25	Numerical Modelling of Multiphase Flows	MW	Jochen Fröhlich Ramandeep Jain	2V/1Ü/1P	german	Summer	Jochen Fröhlich	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1302-1H1630	
26	System Dynamics	MW	Michael Beitelschmidt	2V/2Ü	english	Winter	Michael Beitelschmidt	Written Examination	120 min	4	K1301-1H0500	
27	Turbulent flows and their modelling	MW	Jochen Fröhlich Jörg Stiller	2V/2Ü	german	Summer	Jochen Fröhlich	Written Examination	90 min	4	K1302-1H0521	
28	Team Project	beliebig	beliebig	8 SWS Projekt- bearbeitung	german/ english	Summer	after confirmation Examination Committee CMS	1. Written Project Report 70 hr 2. Oral Presentation 30 min		8	K1100-CMS11X	

CMS-CE-AT	Advanced Topics in Finite Element Analysis			Responsible Lecturer:		Prof. Dr. Markus Kästner		M1100-CMS631
Compulsory Module								PO 2020
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
Finite Element Analysis - Multifield Methods	MW	Markus Kästner Marreddy Ambati	2V/2Ü	english	Summer	Markus Kästner Marreddy Ambati	Written Examination 120 min/Oral Assessment 20 min <=25 participants	K1301-EX3045

CMS-CE-MBD	Multibody Dynamics		Responsible Lecturer:		Prof. Dr. Michael Beitelschmidt		M1100-CMS64	
Compulsory Module								
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
Kinematik und Kinetik der Mehrkörpersysteme / Kinematics and Kinetics of Multibody Systems	MW	Michael Beitelschmidt David Bernstein	2V/2Ü	german/ english	Summer	Beitelschmidt	Written Examination 90 min	K1301-1H1305

CMS-CE-MP	Multifield Problems		Responsible Lecturer:		Prof. Dr. Thomas Wallmersperger			M1100-CMS65
Compulsory Module								
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
Multifield Problems	MW	Thomas Wallmersperger Marco Rossi	2V/2Ü	english	Summer	Thomas Wallmersperger Marco Rossi	Written Examination 120 min/Oral Assessment 30 min <=15 participants	K1301-1H1270V K1301-EX1270Ü

CMS-CE-CFD	Computational Fluid Dynamics			Responsible Lecturer:	Prof. Dr. Jochen Fröhlich			M1100-CMS66
Compulsory Module								
Course Title	Faculty	Lecturer	SWS Effort	Language	Semester	Examiner	Examination performance	Course number Selma
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	K1302-EX3040

CMS-CE-EL2		Computational Engineering Advanced		Responsible Lecturer:		Prof. Dr. Michael Beiteltschmidt				M1100-CMS62		
Compulsory Module with Electives Catalogue (Setpoint: 12 SWS)												
Eine Lehrveranstaltung des Katalogs CMS-CE-EL2 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-CE-EL2 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	Notes
1	Electromechanical Networks	Eul	Uwe Marschner	2V/1Ü	english	Winter	Uwe Marschner	Written Examination	120 min	3	K1212-500060	
2	Numerical Methods for Electromagnetic Theory	Eul	Ralf Theo Jacobs	2V/1Ü	german	Summer	Ralf Theo Jacobs	Written Examination 120 min/Oral Assessment 30 min <=20 participants		3	K1202-1E0080	
3	Introduction to Optical Non-classical Computing	Eul	Kambiz Jamshidi	4V/2Ü	english	Winter	Kambiz Jamshidi	1. Oral Assessment 30 min 2. Presentation 20 min		6	K1210-500240	
4	Future Computing Strategies in Nano-Electronic Systems	Eul	Alon Ascoli	2V/1Ü	english	Winter	Alon Ascoli	Written Examination 90 min/Oral Assessment 30 min <=5 participants		3	K1208-500170	
5	Scientific Programming	Eul	Ralf Theo Jacobs	1V/2P	german	Summer	Ralf Theo Jacobs	Laboratory Protocol		3	K1202-1E0081	
6	Advanced Problem Solving and Search	INF	Lucía Gómez Álvarez Sarah Alice Gaggl	2V/2Ü	english	every	Lucía Gómez Álvarez Sebastian Rudolph	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1107-MA0056	
7	Advanced User Interfaces	INF	Raimund Dachzelt Anke Lehmann	2V/2Ü	german/english	Summer	Raimund Dachzelt Anke Lehmann	Written Examination	90 min	4	K1104-MA0001	Maximum 5 participants
8	Computer Vision 1	INF	Björn Andres	2V/2Ü	english	Winter	Björn Andres	Oral Assessment	30 min	4	K1107-MA0009	
9	Computer Graphics 1	INF	Stefan Gumhold	2V/2Ü	german/english	Winter	Stefan Gumhold	Written Examination 90 min/Oral Assessment 20 min <=15 participants		4	K1104-MA0025	
10	Data Visualization	INF	Raimund Dachzelt Stefan Gumhold	2V/2Ü	german/english	Winter	Raimund Dachzelt Stefan Gumhold	Written Examination 90 min/Oral Assessment 30 min <=10 participants		4	K1104-CMS03	
11	Design Patterns and Frameworks	INF	Uwe Aßmann Sebastian Götz	2V/2Ü	english	Winter	Uwe Aßmann Sebastian Götz	Written Examination 90 min/Oral Assessment 15 min <= 20 participants		4	K1104-MA0020	
12	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	
13	Knowledge Graphs	INF	Markus Krötzsch Maximilian Marx	2V/2Ü	english	Winter	Markus Krötzsch	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1101-MA0024	
14	Performance Analysis of Computing Systems	INF	Wolfgang Nagel Holger Brunst Robert Schöne	2V/2Ü	english	Winter	Wolfgang Nagel Holger Brunst	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1102-MA0007	
15	Machine Learning 1	INF	Björn Andres	2V/2Ü	english	Winter	Björn Andres	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1107-MA0060	
16	Machine Learning 2	INF	Björn Andres	2 Seminar	english	Summer	Björn Andres	Oral Presentation	30 min	2	K1107-MA00625	Maximum 25 participants
17	Particle Methods	INF	Ivo Sbalzarini	2V/2Ü	english	Summer	Ivo Sbalzarini	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1107-MA0006	
18	Scalable Data Engineering	INF	Wolfgang Lehner Claudio Hartmann	2V/2Ü	english	Winter	Wolfgang Lehner Dirk Habich	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1106-MA0023	
19	Scientific Visualization	INF	Stefan Gumhold	2V/2Ü	english	Summer	Stefan Gumhold	Written Examination 90 min/Oral Assessment 20 min <= 15 participants		4	K1104-MA0032	
20	User Interface Engineering	INF	Raimund Dachzelt Anke Lehmann	2V/2Ü	german/english	Winter	Raimund Dachzelt Anke Lehmann	Written Examination 90 min/Oral Assessment 20 min <= 10 participants		4	K1104-MA0024	Maximum 5 participants

21	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	only remaining places
22	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	only remaining places
23	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	only remaining places
24	Coupled Simulation/Real Time Simulation	MW	Michael Beitelschmidt	2V	english	Winter	Michael Beitelschmidt	Written Examination	90 min	2	K1301-EX0190V	
25	Multi Body Systems	MW	Michael Beitelschmidt Volker Quarz	2 SWS Praktikum	german/ english	every	Michael Beitelschmidt	ungraded Assignment (must be passed)		2	K1301-1H1625P	
26	Numerical Modelling of Multiphase Flows	MW	Jochen Fröhlich Ramandeep Jain	2V/1Ü/1P	german	Summer	Jochen Fröhlich	Written Examination 90 min/Oral Assessment 30 min <= 10 participants		4	K1302-1H1630	
27	System Dynamics	MW	Michael Beitelschmidt	2V/2Ü	english	Winter	Michael Beitelschmidt	Written Examination	120 min	4	K1301-1H0500	
28	Turbulent flows and their modelling	MW	Jochen Fröhlich Jörg Stiller	2V/2Ü	german	Summer	Jochen Fröhlich	Written Examination	90 min	4	K1302-1H0521	
29	Team Project	beliebig	beliebig	8 SWS Projekt- bearbeitung	german/ english	Summer	after confirmation Examination Committee CMS	1. Written Project Report 70 hr 2. Oral Presentation 30 min		8	K1100-CMS11X	