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MA-BMB-01	**Computer-based Statistics**	**1st sem.**	**3 CP**
Module	**Computer-based Statistics**		
Module code	MA-BMB-01		
Faculty/Subject/Department	Faculty 06, Department of Sports Science		
Associated degree course/semester taken	MA BMB/1		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students use current statistics software to analyse given data sets. The students are familiarised with the editing of data formats for specific analysis purposes. Students can determine the parameters of the applied methods in an appropriate manner. Furthermore, students can interpret the printed results and create simple graphical representations of these results.		
Module contents	The students practice the use of the following statistical methods on given example data sets • Descriptive statistics • Statistical analysis of difference and connection hypotheses with parametric and non-parametric methods • Uni- and multi-factorial analysis of variance • Analysis of variance with repeated measurements		
Percentage share of instruction form(s)	Seminar 50%/Tutorial 50%		

Workload in hours							
Total workload	90 hours = 3 ECTS credits						
Course type and title		A courses a contact hours	A courses b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration	Sum
S	Seminar “Computer-assisted Statistics“	15	15	0	0	30
T	Tutorial “Computer-assisted Statistics I“	15	30	10	5	60
	Sum	30	45	10	5	90

Module examination		
Prerequisite(s) for examination	Regular and active participation (minimum 80%)	
Form(s) of assessment (scope)	Report of results about the processing of an analytical task	
Contribution to final mark	100% report of results	
Form of module-component retake examination	Results report of a further analytical task	
Form of module retake examination	Retake examination: oral examination, duration:45 minutes	

Frequency	Every year	duration: 1 semester	winter semester: S and T summer semester:
Intake capacity	30		
Language of instruction	German and English		
Additional information:	Guidance on module and required literature: see notice board/date: see course catalogue		

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MA-BMB-02	**Fundamentals of Biomechanics**	**1st + 2nd sem.**	**9 CP**
Module	**Fundamentals of Biomechanics**		
Module code	MA-BMB-02 ; KMUB-10490 and KMUB-10510		
Faculty/Subject/Department	04 KMUB		
Associated degree course/semester taken	MA BMB/1 + 2		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students can explain the typical interrelations between movements which occur during human motion using biomechanical terms. They can illustrate complex interrelations with the help of simple models and can explain the limitations of these models. They have the ability to determine the typical ranges of physical parameters and to estimate biomechanical loads.		
Module contents	• Biomechanics 1: Clinical biomechanics, multibody systems; sensorimotor functions; gait analysis; introduction into metrology in gait analysis • Biomechanics 2: Mechanical kinesiology, dynamics; biological materials; modelling of the human being; physical properties of subsegments; contact forces; biomechanics of athletic motion; metrology in biomechanics; data processing; visualization of biomechanical motions		
Percentage share of instruction form(s)	Lecture 57%/Laboratory 43%		

Workload in hours

Total workload: 270 hours = 9 ECTS credits

Course type and title	A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L1 Biomechanics 1	30	30		15	75
P1 Biomechanics 1	30	15	15	15	75
L2 Biomechanics 2	30	30		15	75
P2 Biomechanics 2	15	15	8	7	45
Sum	105	90	23	52	270

Module examination

Prerequisite(s) for examination	Regular and active participation in laboratories
Form(s) of assessment (scope)	Biomechanics 1 and Biomechanics 2, one technical discussion each, lasting approx.15 minutes
Contribution to final mark	Biomechanics 1: 57%, Biomechanics 2: 43%
Form of module-component retake examination	Technical discussion
Form of module retake examination	Retake examination: oral examination with duration of 45 minutes, examining all module content

Frequency	Every year duration: 1 year winter semester: Biomechanics 1 L1 and P1 summer semester: Biomechanics 2 L2 and P2
Intake capacity	15
Language of instruction	German and English
Additional information	Guidance on module and required literature: see notice board/date: see course catalogue

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MA-BMB-03	**Electrical Metrology**	**1st sem.**	**6 CP**
Module	**Electrical Metrology**		
Module code	MA-BMB-03; KMUB-10920		
Faculty/Subject/Department	04 KMUB		
Associated degree course/semester taken	Master Biomechanics-Motor Skills-Motion Analysis/1st semester		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students - can plan, prepare, document and analyse results of a practical measurement task and can present the acquired results, - are familiar with the components of measurement systems and can describe their properties, - learn the calculation of errors		
Module contents	– Fundamental metrology terminology; measurement systems: measurement errors, statistical and dynamical characteristics of measurement systems; measurement chains, transmission behaviour ; sensors, fundamentals of computer-assisted metrology – Laboratory: documentation and reporting, accuracy of measurement systems, sensor circuits; dynamic features of a temperature sensor		
Percentage share of instruction form(s)	Lecture 50%/Seminar 0%/Tutorial 25%/Laboratory 25%		

Workload in hours

Total workload	180 hours = 6 ECTS credits

Course type and title		A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L	Lecture “Electrical Metrology“	30	15	15	15	75
T	Tutorial “Electrical Metrology“	15		30		45
P	Laboratory “Electrical Metrology“	15	45			60
	Sum	60	60	45	15	180

Module examination

Prerequisite(s) for examination	Active participation in all laboratory experiments including documentation and reporting of the experiments
Form(s) of assessment (scope)	Final examination 90 minutes
Contribution to final mark	Part 1: 60% contents of lecture, part 2: 40% contents of tutorial and laboratory
Form of module-component retake examination	Technical discussion (30 minutes)
Form of module retake examination	Final examination90 minutes

Frequency	Every year duration: 1 semester fall semester: complete module summer semester:
Intake capacity	16 (capacity of laboratory), unlimited (capacity of lecture hall)
Language of instruction	German
Additional information	Guidance on module and required literature: see notice board/date: see timetable of department

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MA-BMB-04	**Applied Mathematics**	**1st sem.**	**12 CP**
Module	**Applied Mathematics**		
Module code	MA-BMB-04; KMUB-12870		
Faculty/Subject/Department	04 KMUB		
Associated degree course/Semester taken	Master Biomechanics-Motor Skills-Motion Analysis/1st semester		
Module coordinator	Cf. German version		
Prerequisites	None		

Learning outcomes	The students can apply mathematical rules (elemental algebra, ”calculation”), have a command of physical quantities and units and are familiar with elemental and trigonometric functions. They can differentiate and integrate simple functions. The students command the basic methods of linear algebra and differential and integral calculus. They can autonomously identify issues from these areas correctly and choose the correct method for solving the problem. They can apply the appropriate solution method manually as well as with the help of Matlab and can interpret the results.
Module contents	(a) Elemental algebra, use of physical quantities and units; elemental functions, trigonometric functions, analytical geometry (b) Linear algebra, vectors, determinants, matrices; differential calculus: product rule, quotient rule, chain rule; higher derivatives, extreme value problems, curve sketching, partial derivatives, vector calculus (c) Integral calculus: antiderivatives, definite integrals, substitution, integration of rational fractional functions, improper integrals, numerical integration; ordinary differential equations

Percentage share of instruction form(s)	Lecture 50%/Tutorial 50%

Workload in hours

Total workload	360 hours = 12 ECTS credits				
Course type and title	A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L Lecture “Applied Mathematics“	60	30		30	120
S1 Seminar 1 “Applied Mathematics“					0
S2 Seminar 2 “Applied Mathematics“					0
T Tutorial Mathematics	75	15	90	10	190
Matlab	15		35		50
Sum	150	45	125	40	360

Module examination

Prerequisite(s) for examination	Written assignments: submission of a detailed, handwritten solution to 15 exercises in part (a); electronic submission of 10 Matlab solutions to exercises.
Form(s) of assessment (scope)	Final examination(120 minutes) Written assignments from parts (b) and (c): evaluation of 10 selected handwritten exercises and 5 Matlab solutions
Contribution to final mark	70% final examination 30% evaluated written assignments (2% per assignment) In order to pass, the sum must be ≥ 50%.
Form of module-component retake examination	If the final examination is not passed:: oral examination (30 minutes) If the written assignments are not passed: 30 minutes for the solution of an exercise using Matlab (examination conditions without auxiliary means) at a PC including a handwritten approach to the solution
Form of module retake examination	Final examination (120 minutes) with maximum 100% of the final grade

Frequency	Every year duration: 1 semester winter semester: lecture and tutorials summer semester:

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Intake capacity	24 (capacity of PC-laboratory), unlimited (capacity of lecture hall)
Language of instruction	German
Additional information	Guidance on module and required literature: see notice board/date: see timetable of department

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MA-BMB-05	**Specific Data Analysis I**	**2nd sem.**	**9 CP**
Module	**Specific Data Analysis and Statistics**		
Module code	MA-BMB-05; KMUB-12880		
Faculty/Subject/Department			
Associated degree course/Semester taken	MA BMB/2nd semester		
Module coordinator	Cf. German version		
Prerequisites	None		

Learning outcomes	The students are familiar with filtering processes, smoothing and interpolation of statistical data series as well as the possibilities of applying these to the analysis of human motion. The students can apply these methods in the analysis of kinematic and dynamic measured values. They can modify the underlying algorithms for a specific problem and can transfer this into executable programme routines.
Module contents	• Detection of outliers/measurement errors • Smoothing methods (e.g. moving average, Butterworth) • Trend analysis • ARIMA models • Signal analysis and programming with MATLAB
Percentage share of instruction form(s)	Lecture 33%/Seminar 33%/Tutorial 33%

Workload in hours

Total workload: 270 hours = 9 ECTS credits

Course type and title	A courses: a contact hours	A courses: b preparation/ revision	B autonomous work	C examination incl. preparation	Sum
L Lecture Specific Methods of Data Analysis	30	30	0	30	90
S Seminar Statistics 1	30	30	15	15	90
T Programming MATLAB2	30	30	30		90
Sum	90	90	45	45	270

Module examination

Prerequisite(s) for examination	Regular and active participation in seminar and tutorials (minimum 80%)
Form(s) of assessment (scope)	Processing of an analytical task: Writing of a report and a Matlab programme
Contribution to final mark	100% analytical task
Form of module-component retake examination	Retake of analytical task with modified task
Form of module retake examination	Retake examination: oral examination with duration of 45 minutes, examining all module content

Frequency	Every year duration: 1 semester winter semester: summer semester: L, S and T
Intake capacity	30
Language of instruction	German and English
Additional information	Guidance on module and required literature: see notice board/date: see course catalogue

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MA-BMB-06	**Advanced Biomechanics**	**2nd sem.**	**6 CP**
Module	**Advanced Biomechanics: Bionics**		
Module code	MA-BMB-06; KMUB-10190		
Faculty/Subject/Department	04 KMUB		
Associated degree course/semester taken	MA BMB/2		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	Through the comparison of technical designs structures/phenomena, the students shall be encouraged to develop new technical biomechanical solutions. The students should have the capability to evaluate and estimate the limitations of technical solutions. Typical applications examples are taken from the areas of technical orthopaedics, prosthetics and orthotics.		
Module contents	• Materials • Model making/construction/lightweight design • Joints • Optimization strategies • Technical realizations		
Percentage share of instruction form(s)	Lecture 50%/Laboratory 25%/Tutorial 25%		

Workload in hours	Total workload	180 hours = 6 ECTS credits					
	Course type and title		A courses a contact hours	b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
	L	Bionics	30	15		30	75
	P	Bionics	15	15	15	15	60
	T	Bionics	15		15	15	45
		Sum	60	30	30	60	180

Module examination	Prerequisite(s) for examination	Regular and active participation in tutorials and laboratories (minimum 80%)
	Form(s) of assessment (scope)	Technical discussion 15 minutes
	Contribution to final mark	100% technical discussion
	Form of module-component retake examination	Technical discussion
	Form of module retake examination	Retake examination: oral examination with duration of 45 minutes, examining all module content
Frequency		Every year duration: 1 semester winter semester: summer semester: L, T and P
Intake capacity		30
Language of instruction		German and English
Additional information		Guidance on module and required literature: see notice board/date: see course catalogue

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MA-BMB-07	**Neurophysiological Foundations of Human Movement**	**3rd sem.**	**6 CP**
Module	**Neurophysiological Foundations of Human Movement**		
Module code	MA BMB-07		
Faculty/Subject/Department			
Associated degree course/semester taken	BMB/3rd semester		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students gain a fundamental knowledge in the area of cognitive neuroscience and deepen this knowledge in the areas of perception and action. They have the ability to apply this knowledge to motor learning and the associated consequences for the rehabilitation process.		
Module contents	- Fundamentals of cognitive neuroscience - Perception and action - Physiology of motor control - Neuroplasticity and motor learning		
Percentage share of instruction form(s)	Lecture 28%/Seminar 50%/Tutorial 22%		

Workload in hours

Total workload: 180 hours = 6 ECTS credits

Course type and title	A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L Lecture “Neurophysiology of Motor Skills“	15	15	0	20	50
T Tutorial “Neurophysiology of Motor Skills“	15	15	10		40
S Specialisation Seminar “Neurophysiology of Motor Skills“	30	30	30		90
Sum	60	60	40	20	180

Module examination

Prerequisite(s) for examination	Successful participation in lecture/oral presentation in specialisation seminar
Form(s) of assessment (scope)	Examination (90 minutes) Presentation
Contribution to final mark	Grade of examination (50%), grade of oral presentation (50%)
Form of module-component retake examination	Examination (90 minutes), Written assignment (10 pages)
Form of module retake examination	Examination (90 minutes), examining all module content
Frequency	Every semester duration: 2 semesters winter semester: L /T summer semester: S
Intake capacity	L (unlimited) T (30) S (15)
Language of instruction	German or English
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue

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MA-BMB-08	**Movement Specific Measurement Methods**	**2nd/3rd sem.**	**9 CP**
Module	**Movement Specific Measurement Methods**		
Module code	MA-BMB-08		
Faculty/Subject/Department	Faculty 06/Department of Sports Science/Sports Psychology and Kinesiology		
Associated degree course/semester taken	Master Biomechanics-Motor Skills-Motion Analysis/2nd and 3rd semester		
Module coordinator	Cf. German version		
Prerequisites	The practical part of the module "General Metrology" has to be completed successfully		
Learning outcomes	The students have a profound knowledge of measuring methods applied in motion analysis within the scientific fields of biomechanics and motor skills. They have the ability to adequately determine the most suitable measurement methods (kinematical, dynamometrical or electrophysiological) and adjust these to specific problems. The students can programme a data acquisition interface (DAQ) and can gather, save, process and illustrate the data from the DAQ with the help of a measurement system. They have knowledge of a visual programming language – e.g. Labview or Presentation – and can apply this language. The students can analyse and interpret acquired measurement data in accordance with current standards.		
Module contents	- Measurement methods for the acquisition of external forces, pressure distribution and acceleration - Optical measurement methods - Electromyography - Visual programming language: fundamentals, objects, process structures, data types and data structures - Data acquisition with a DAQ - Analysis and illustration of data with corresponding software		
Percentage share of instruction form(s)	Lecture 17%/Seminar 33%/Tutorial 50%		

Workload in hours

Total workload	270 hours = 9 ECTS credits				
Course type and title	A courses a contact hours	b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L 45 Lecture "Specific Measurement Methods"	15	15	0	15	
S 105 Seminar "Specific Measurement Methods"	30	30	25	20	
T1 45 Tutorial "Specific Measurement Methods"	15	15	15		
T2 90 Tutorial "Programming Measurement Data Acquisition"	30	15	45		
Sum	90	75	85	35	270

Module examination

Prerequisite(s) for examination	Regular and active participation in tutorials and seminar
Form(s) of assessment (scope)	Examination (60 minutes) of L, graded presentation in S, measurement report T1 Regular participation in T2 (not graded)
Contribution to final mark	Examination (50%)/presentation (25%)/measurement report (25%)
Form of module-component retake examination	Examination (60 minutes)/written assignment(10 pages)/re-submission of measurement report
Form of module retake examination	Oral examination regarding content of L, S, T1 (30 minutes)

Frequency	Frequency of module: annual	duration of module: 2 semesters	winter semester: T2 summer semester.: L, S, T1

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Intake capacity	L (unlimited) S (30) T (15)
Language of instruction	German
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue

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MA-BMB-09	**Specific Data Analysis II**	**3rd sem.**	**6 CP**
Module	**Specific Data Analysis and Statistics II**		
Module code	MA-BMB-09		
Faculty/Subject/Department	Faculty 06, Department of Sports Science		
Associated degree course/semester taken	MA BMB/3		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students have the ability to estimate expected values for multivariate non-linear interrelations typically occurring in human motions on the basis of measured stochastic parameters. They can calculate the frequency of occurrence of certain results and can apply this in the context of problem-specific inferiential statistics. The students have the ability to apply these calculation methods in programming tasks.		
Module content	• Assessment of expected values • Monte Carlo method • Bootstrapping • Bayesian inference • Specific analytical methods		
Percentage share of instruction form(s)	Seminar 100%		

Workload in hours							
Total workload	180 hours = 6 ECTS credits						
Course type and title		A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum	
S	Seminar “Specific Methods of Data Analysis“	30	30	0	30	90	
S	Seminar “Project Specific Inferential Statistics“	30	30	15	15	90	
	Sum	60	60	15	45	180	

Module examination		
Prerequisite(s) for examination	Regular and active participation (minimum 80%)	
Form(s) of assessment (scope)	Solving of an analytical task: submission of a report	
Contribution to final mark	100% analytical task	
Form of module-component retake examination	Retake of analytical task	
Form of module retake examination	Retake examination: oral examination with duration of 45 minutes, examining all module content	
Frequency	Every year duration: 1 semester winter semester: S1, S2 summer semester:	
Intake capacity	30	
Language of instruction	German and English	
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue	

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MA-BMB-10	**Motor Control and Learning**	**3rd sem.**	**6 CP**
Module	**Motor Control and Learning**		
Module code	MA-BMB-10		
Faculty/Subject/Department	Faculty 06, Department of Sports Science		
Associated degree course/semester taken	BMB/3rd semester		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students are familiar with the fundamental paradigms of experimental research on motor skills. They learn to understand experimental designs and to develop these autonomously. In the specialisation seminar the students are taught the principles of literature reviewing, including documentation and discussion of results. These principles are then applied by the students in a literature review of the current state of the art in a specific subject.		
Module contents	- Motor control of human motion - Motor learning (fundamentals and application) - Particular problems of motor development		
Percentage share of instruction form(s)	Seminar 100%		

Workload in hours

Total workload	180 hours = 6 ECTS credits

Course type and title		A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
S	Seminar Motor Control and Motor Learning	30	30	10	20	90
S	Specialisation Seminar Motor Skills	30	30	30		90
	Sum	60	60	40	20	180

Module examination

Prerequisite(s) for examination	Regular and active participation/group examination in S1/oral presentation and written assignment in S2
Form(s) of assessment (scope)	S1: group examination (30 minutes) S2: presentation, literature review and/or written assignment
Contribution to final mark	Grade of group examination (50%)/grade of written assignment (50%)
Form of module-component retake examination	S1: oral examination (30 minutes) S2: essayer-submission of written assignment within 4 weeks
Form of module retake examination	Examination (90 minutes)

Frequency	Every year duration: 2 semester winter semester: S1 Summer semester: S2
Intake capacity	S1 (30) S2 (30)
Language of instruction	German or English
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue

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MA-BMB-11	**Study Project: Development and Practical Application of Measurement Methods**	**3rd sem.**	**9 CP**
Module	**Study Project: Development and Practical Application of Measurement Methods**		
Module code	MA-BMB-11/KMUB-12900		
Faculty/Subject/Department	FB 04 KMUB		
Associated degree course/semester taken	Master BMB/3rd semester		
Module coordinator	Cf. German version		
Prerequisites	Participation in module MA-BMB-8 “Specific Measuring Methods“		
Learning outcomes	The students will gain experience in academic research work and apply their knowledge in practically oriented projects, i.e. they shall be able to define, plan, prepare, implement and present a scientific project autonomously.		
Module contents	Topics of projects from the areas of: • Gait analysis • Clinical biomechanics • Accident reconstruction/passive safety • Ergonomics/rehabilitation technology • Technical orthopaedics, prosthetics/orthotics		
Percentage share of instruction form(s)	Tutorial on principles of academic research work/Seminar 100%		

Workload in hours					
Total workload	270 hours = 9 ECTS credits				
Course type and title	A courses a contact hours	b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
Project Dyna/Kine/Elec	90		180		270
Sum	90		180		270

Module examination	
Prerequisite(s) for examination	Regular and active participation (minimum 80%)
Form(s) of assessment (scope)	Oral presentation 10 minutes, written scientific report, technical discussion 15 minutes
Contribution to final mark	Oral presentation 10%, written report 50%, technical discussion 40%
Form of module-component retake examination	If grade is between 30% and 50%: English version of scientific work with a scope of 4 pages in publication format
Form of module retake examination	Retake examination: oral examination in the scope of 45 minutes about all contents of the module

Frequency	Every year duration: 1 semester winter semester: summer semester: project work
Intake capacity	30
Language of instruction	German and English
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue

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MA-BMB-12	**Elective Module(s) 1**	**2nd or 3rd sem.**	**6 CP**
Module	**Elective Module(s) I**		
Module code	MA-BMB-12		
Faculty/Subject/Department	Faculty 06/Department of Sports Science/Sports Psychology and Kinesiology		
Associated degree course/semester taken	Master Biomechanics-Motor Skills-Motion Analysis		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students gain a fundamental knowledge in a broad range of science and engineering disciplines. Since the competences/learning outcomes depend on the chosen modules, these are detailed in the descriptions of the modules which are available for selection.		
Module contents	The content of the elective modules depends on various factors (number of interested students, availability of lecturers, capacity of laboratory etc.) and can alter each semester. The range of courses usually offered is listed in the catalogue of elective modules. Upon application any module from the range of available courses at the university can be chosen; the examination board decides upon application on the acceptance of the chosen module as an elective module.		
Percentage share of instruction form(s)	Lecture 0%/Seminar 0%/Tutorial 0%		

Workload in hours					
	Total workload	0 hours = 0 ECTS credits			
	Course type and title	A courses a contact hours	b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration Sum
	L Lecture Title				
	S1 Seminar 1 Title				
	S2 Seminar 2 Title				
	T Tutorial Title				
	Sum				

Module examination		
	Prerequisite(s) for examination	See description of particular elective module
	Form(s) of assessment (scope)	See description of particular elective module
	Contribution to final mark	See description of particular elective module
	Form of module-component retake examination	See description of particular elective module
	Form of module retake examination	See description of particular elective module
Frequency		See description of particular elective module
Intake capacity		Depending on particular module
Language of instruction		Usually German
Additional information		Information on current elective modules can be obtained from the head of the relevant degree course

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MA-BMB-13	**Elective Module(s) 2**	**2nd sem.**	**3 CP**
Module	**Elective Module(s) 2**		
Module code	MA-BMB-13		
Faculty/Subject/Department	FB 04 KMUB		
Associated degree course/semester taken	Master Biomechanics-Motor Skills-Motion Analysis/2nd semester		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students gain a fundamental knowledge in a broad range of science and engineering disciplines. Since the competences/learning outcomes depend on the chosen modules, these are detailed in the descriptions of the modules which are available for selection.		
Module content	The content of the elective modules depends on various factors (number of interested students, availability of lecturers, capacity of laboratory etc.) and can alter each semester. The range of courses usually offered is listed in the catalogue of elective modules. Upon application any module from the range of available courses at the university can be chosen; the examination board decides upon application on the acceptance of the chosen module as an elective module.		
Percentage share of instruction form(s)	Lecture 0%/Seminar 0%/Tutorial 0%		

Workload in hours					
	Total workload	0 hours = 0 ECTS credits			
	Course type and title	A courses a contact hours	b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration Sum
	L Lecture Title				
	S1 Seminar 1 Title				
	S2 Seminar 2 Title				
	T Tutorial Title				
	Sum				

Module examination		
	Prerequisite(s) for examination	See description of particular elective module
	Form(s) of assessment (scope)	See description of particular elective module
	Contribution to final mark	See description of particular elective module
	Form of module-component retake examination	See description of particular elective module
	Form of module retake examination	See description of particular elective module
Frequency		See description of particular elective module
Intake capacity		Depending on particular module
Language of instruction		Usually German
Additional information		Information on current elective modules available at head of degree course

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MA-BMB-13a	**Rehabilitation Technology / Geriatrics**	**2nd sem.**	**3 CP**
Module	**Rehabilitation Technology / Geriatrics**		
Module code	KMUB-11850		
Faculty/Subject/Department	04 KMUB		
Associated degree course/semester taken	MA BMB/2		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	In rehabilitation, the patient's individual abilities and limitations must be identified in order to ensure a successful integration back into everyday and professional life. This can be achieved by means of a purposeful choice and adaptation of the support resources and of the surroundings. The specific environment of a patient due to particular surroundings must also be considered. The students gain a profound knowledge of the complex interrelation between limitations and the environment. They can evaluate the current technological status through which the limitations can be compensated. The students can write reports in the form of an expert assessment.		
Module content	• Perception • Disability, support resources, accessibility, mobility • Rehabilitation; visual impairment - deafness -/age-related disabilities and alteration of sensory perception/motion training; geriatrics, working aids • Techniques for developing support resources/training methods and education		
Percentage share of instruction form(s)	Lecture 50%/Practical training 50%		

Workload in hours

Total workload	90 hours = 3 ECTS credits

Course type and title	A courses a contact hours	A courses b prep-aration/ revision-	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L Rehabilitation Technology	0	15	30	15	90
Sum	30	15	30	15	90

Module examination

Prerequisite(s) for examination	None
Form(s) of assessment (scope)	Oral examination 30 minutes
Contribution to final mark	Oral examination 100%
Form of module-component retake examination	
Form of module retake examination	Retake examination: oral examination

Frequency	Every year duration: 1 year winter semester: summer semester: L
Intake capacity	15
Language of instruction	German and English
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

MA-BMB-13b	**Pathomechanics**	**2nd sem.**	**3 CP**
Module	**Pathomechanics**		
Module code	KMUB-11790		
Faculty/Subject/Department	04 KMUB		
Associated degree course/semester taken	MA BMB/2		
Module coordinator	Cf. German version		
Prerequisites	None		

Learning outcomes	The aim of accident research is to avoid human injury. In order to achieve this, biomechanical knowledge is required. Such knowledge is also necessary in accident assessment, for which the motion sequence and acting forces need to be evaluated. The students are familiarised with the interrelation between acting forces and tissue damage. The students can geometrically reconstruct a motion sequence in the context of an accident. They are familiar with safety devices which can be used to avoid an overloading of the human body and can an adequate safety device for a corresponding situation.
Module content	• Loading behaviour • Material behaviour • Morphometrics of injuries • Accident reconstruction • Passive safety
Percentage share of instruction form(s)	Lecture 67%/Laboratory 33%

Workload in hours	Total workload	90 hours = 3 ECTS credits				
	Course type and title		A courses a contact hours	b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration	Sum
	L	Pathomechanics	30	15		15	60
	P	Pathomechanics	15	8		7	30
		Sum	45	23		22	90

Module examination	Prerequisite(s) for examination	Regular and active participation in laboratories; submission of a scientific report
	Form(s) of assessment (scope)	Technical discussion 15 minutes
	Contribution to final mark	Lecture 50% laboratory 25% scientific report 25%
	Form of module-component retake examination	Retake of scientific report on modified topic
	Form of module retake examination	Retake examination: oral examination with a duration of 30 minutes, examining all module content
Frequency		Every year duration: 1 year winter semester: summer semester: L and P
Intake capacity		15
Language of instruction		German and English
Additional information		Guidance on module and required literature: see notice board / Date: see course catalogue

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MA-BMB-13c	**Ergonomics**	**3rd sem.**	**3 CP**
Module	**Ergonomics**		
Module code	Ma-BMB-13c		
Faculty/Subject/Department	FH Gi-Fb FB 21 SuK		
Associated degree course/semester taken	Master BMB/3rd semester		
Module coordinator	Cf. German version		
Prerequisites	None		
Learning outcomes	The students understand the significance of human beings as factors of production in modern work systems. They shall have the ability to evaluate and design both production-based and administration workplaces with respect to ergonomic aspects.		
Module content	• Fundamentals of occupational physiology, work psychology and organisational psychology • Dimensions and motion technology of work design • Physical work environment and its design • (Acoustics, lighting, colour, room temperature) • Information input media • Information output media • Software ergonomics • Legal requirements		
Percentage share of instruction form(s)	Lecture 100%		

Workload in hours						
Total workload	90 hours = 3 ECTS credits					
Course type and title		A courses a contact hours	b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration	Sum
L	Lecture Ergonomics	30	15	30	15	90
	Sum	30	15	30	15	90

Module examination		
Prerequisite(s) for examination	None	
Form(s) of assessment (scope)	Examination 90 minutes	
Contribution to final mark	Examination: 100%	
Form of module retake examination	Retake of examination	

Frequency	Every year	duration: 1 semester	winter semester: lecture
Intake capacity	Unlimited (capacity of lecture hall)		
Language of instruction	German		
Additional information	Guidance on module and required literature: see notice board / Date: see course catalogue		

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MA-BMB-14	**Thesis**	**4th sem.**	**30 CP**
Module	**Thesis**		
Module code	MA-BMB-14; KMUB-12920		
Faculty/Subject/Department			
Associated degree course/semester taken	Master Biomechanics-Motor Skills-Motion Analysis/4th semester		
Module coordinator	Cf. German version		
Prerequisites	Successful completion of 1st year of study, successful completion of all projects, plus 15 ECTS credits from 3rd semester		
Learning outcomes	Ability to work on an autonomously composed project plan which treats a current scientific problem; effective academic working in a project group, defending of own strategies both internally and externally; acquisition of the necessary endurance in order not to let oneself get discouraged in case of unexpected problems and setbacks in scientific projects and in order to come to a solution by considering alternative approaches to the problem; acquisition of the ability to discuss own research results comprehensively in an environment of current international research and to present results in written/oral form.		
Module content	Corresponding to the topic of the master's dissertation		
Percentage share of instruction form(s)	Project 100%; Tutorial on principles of academic research work		

Workload in hours

Total workload: 900 hours = 30 ECTS credits; 6 months

Course type and title	A courses a contact hours	A courses b prep-aration/ revision	B auto-nomous work	C exam-ination incl. prep-aration	Sum
Project			850	50	900
Sum			850	50	900

Module examination

Prerequisite(s) for examination	A table of contents of between 50 and 100 words must be submitted in German and English prior to the oral examination of the master's dissertation for the preparation of the transcript of records. This table of contents must be approved by the examining committee.
Form(s) of assessment (scope)	Writing of a master's dissertation and an oral examination (defence of the dissertation) with duration of between 20 and 30 minutes; the regulations for the master's dissertation of the general conditions (part I of the examination regulations) must be considered.
Contribution to final mark	Weighting: written dissertation (master's dissertation): 75%; oral examination (defence): 25%
Form of module-component retake examination	If the master's dissertation is not passed: the student will be given four weeks for the resubmission of the dissertation. If the oral examination is not passed: the oral examination has to be retaken.
Form of module retake examination	A master's dissertation on a new topic must be submitted within 6 months. The dissertation will again be examined with an oral examination.

Frequency	Every semester duration: 6 months
Intake capacity	Unlimited
Language of instruction	German; upon application, the board of examiners can allow the writing of the master's dissertation in a foreign language after consulting with the examiners
Additional information	With approval of the board of examiners, the practical aspect of the master's dissertation can also be conducted in an appropriate external institution ("external dissertation") Literature: current academic literature regarding the scientific topic