



# BachelorPlus Programm

## Studiengang MECHATRONIK - Vertiefung Mikro-MT

### Internationale Variante der Studienprüfungsordnung (SPO V5)

⇒ ein zusätzliches Semester, damit ein Jahr an einer der

**6 Partner-Hochschulen in USA & Kanada**

⇒ **Bachelor mit 240 ECTS cp**

**Koordinator: Prof. Dr.-Ing. Klemens Gintner (F208)**

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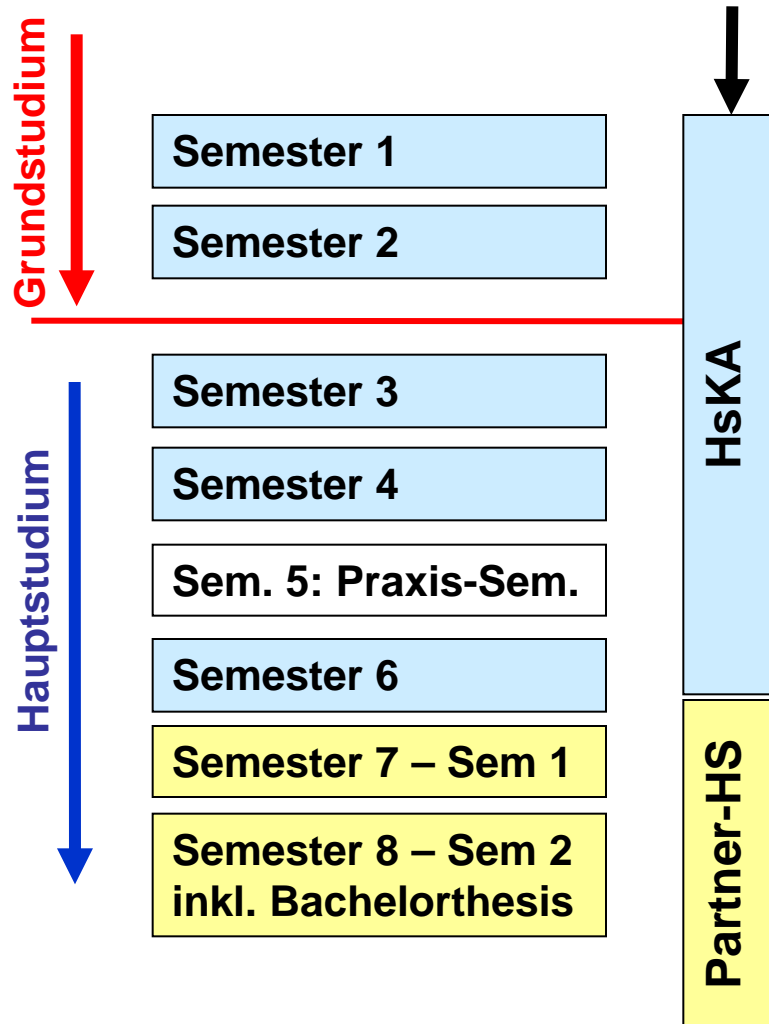


## Mechatronik – BachelorPlus USA/Kanada

- Internationale Partner: BachelorPlus – Programm (zusätzliches Auslands-Semester & letztes Semester inklusive Bachelorthesis  $\Rightarrow$  240 ECTS cp) mit:
  - USA:
    - Cal Poly San Luis Obispo (Kalifornien),
    - Minnesota State University (Minnesota),
    - The Cooper Union, Manhattan (New York City)
  - Kanada:
    - Ryerson University (Toronto),
    - UOIT Oshawa (Nähe Toronto),
    - Lakehead (Norden Ontario)



## Bachelor-Plus-Programm mit USA und Kanada:



ggf. Förderung DAAD:  
Reisekosten und 335 €  
bis 435 € pro Monat

**SPO 5** - Internationale  
Variante: Ein zusätzliches  
Semester (im Ausland),  
Fächer im letzten Semester  
inkl. BT an Partner-HS  
⇒ 240 ECTS cp  
⇒ Beginn an Partner-HS:  
Jeweils September



## MECB – Mikromechatronik: BachelorPlus USA/Kanada

FAQ bzgl. MECB BachelorPlus-Programm (beginnt ab WS16/17):

- Wer kann sich bewerben?

Antwort: Studierende MECB,  $\geq 4$ . Sem., vorzugsweise Mikro-MT;  
Auslandsaufenthalt: 7. + 8. Semester (internat. Studienvariante):

- Wie ist der Studienaufenthalt konzipiert?

Antwort: September bis Juli, zunächst „normale Kurse“, wählbar anhand des Katalogs (vgl. folgende Folien), dann Bachelorthesis an Partnerhochschule; ein Betreuer von dort, Hauptbetreuer von MMT

- Wann kann man sich bewerben?

Antwort: Voraussichtlich je bis spätestens Ende Februar

- Was sollte die Bewerbung enthalten?

Antwort: Vgl. Info-Folien (CV, Notenblatt, Motivation, ...)

- Wer entscheidet über die Auswahl der Studierenden?

Antwort: Entscheider: Prof. Gintner & mind. ein/e Kollege/-in

- Entscheidung über DAAD-Förderung: März 2016



## MECB – Mikromechatronik: BachelorPlus USA/Kanada

Wie und Wo kann man sich für das BachelorPlus-Programm bewerben? (All dies ist Grundlage für die Auswahl)

- Bewerbungsunterlagen:
  - Kurzer Lebenslauf
  - Daten zum laufenden Semester:
    - Studienfach und Vertiefung
    - Praxissemester (schon abgelegt, wann geplant?)
  - Englisch-Kenntnisse (ggf. Zertifikat)
  - Motivationsschreiben (in englischer Sprache!)
  - Notenblatt der bisherigen Leistungen
  - Rangliste über drei gewünschte Hochschulen
- Alles als Email an [klemens.gintner@hs-karlsruhe.de](mailto:klemens.gintner@hs-karlsruhe.de)
- Deadline: Je Ende Februar, Entscheidung dann im März



## Studiengang MECB - MECHATRONIK Internationale Studien-Variante B (SPO V5)

1 EDV-Bez.	2 Modul/Veranstaltung	3 Sem.	4 a cp
MECB710B	Lehrveranstaltungen an der Partnerhochschule	7	24
MECB720B	Wahlpflichtfach 3	7	6
MECB810B	Informationstechnik	8	6
MECB820B	Automatisierungstechnik	8	6
MECB830B	Bachelor-Thesis Vorbereitung	8	3
MECB840B	Abschlusskolloquium	8	3
MECB850B	Bachelor-Thesis	8	12

**An HsKA vorab möglich: MECB702B Wahlpflichtfach 3 mit 6 ECTS cp**



# Studiengang MECB - MECHATRONIK

## Internationale Studien-Variante B (SPO V5)

### Vorschlag für Anrechnung der Kurse

HsKA Fak. MMT Studiengang Mechatronik MECB

Bezeichnung	Fach	ECTS CP
MECB710i-B	Veranstaltungen an Partner-HS	24
MECB720i-B	Wahlpflichtfach 3 (kann auch an HsKA abgelegt werden)	6

MECB810i-B	Informationstechnik V+L	6
MECB811i-B	Informationstechnik Vorl.	3
MECB812i-B	Informationstechnik Labor	3
MECB820i-B	Automatisierungstechnik	6
MECB821i-B	Software-Engineering 2	3
MECB822i-B	Automatisierungstechnik 2 Vorlesung	1
MECB823i-B	Automatisierungstechnik 2 Labor	2

Ryerson University	Lakehead University	UOIT, Oshawa	Cooper Union, NYC	MSU Mankato	Cal Poly San Luis Osbipo
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ELE 724 CMOS Mixed-Mode Circuits and Systems	ENG 4054 Digital VLSI Circuit Design	MANE 4160U Artificial Intelligence	ECE 310 Digital Signal Processing	EET 484 Microprocessor II	EE 415 Communcation Systems Design
COE 838 Systems-on-Chip Design	ENG 3315 Circuit Theory & Design I	ELEE 4350U Microprocessors	ECE 300 Communication Theory	EET 441 Embedded Systems	EE 416 Digital Communcation Systems
ELE 532 Signals and Systems I	ENG 3316 Circuit Theory & Design II	ELEE 4500U Wireless Communications	ECE 165 Data Structures and Algorithms II	EET461 Industrial Automation I	ME405 Mechatronics
ELE 632 Signals and Systems II	MAT 4030 Probability and Statistics	ELEE 4130U Digital Communications	ME 312 Mobile Robots	EET462 Industrial Automation II	EE 516 Pattern Recognition
ELE 888 Intelligent Systems	ENG 3334 Control Systems II	ELEE 4420U DSP Theory and Design	ME153 Mechatronics	EE 334 Microprocessor Engineering II	EE 328 Discrete Time Signals and Systems
ELE 869 Robotics	ENG 4053 Communications Systems	MECE 3390U Mechatronics	ECE 302 Probability Models & Stochastic Processes 3	AET Automotive Computers and Electronics	ME 423 Robotics: Fundamentals adn Applications
MEC 839 Mechatronics System Design	ENG 4632 Digital Signal Processing	ELEE 4150U Advance Control Systems	ME 151 Feedback Control Systems	EET 310 Programmable Tools	EE308 Analog Electronics and Integrated Circuits
MEC 617 Manufacturing System Control	ENG 4134 RF Circuits Design	ELEE 4190U Multimedia Systems	ECE 303 Communication Networks	MET 341 Advanced Parametric Modeling	EE 439 Introduction to Real-Time Operating Systems



## MECB – Mikromechatronik: Internationale Kooperationen

- **USA: Minnesota State University, Mankato, je 6 ECTS cp**

Bezeichnung	Fach
AET 378	Composite Materials
MET 386	Metrology for Engineering Technologists
MET 407	Manufacturing Resource Planning and Control
MET 423	Ergonomics and Work Management
MET 425	Project and Value Management
MET 426	Logistics and Transportation
MET 427	Quality Management Systems
MET 428	Lean Manufacturing
AET 262	Automotive Computers and Electronics
MET 341	Advanced Parametric Modeling
AET 364	Chassis Design and Performance Testing
AET 366	Automotive Thermodynamics and Engine Design
AET 468	Automotive Research Methods





## MECB – Mikromechatronik: Internationale Kooperationen

- **Kanada: Lakehead University, je 6 ECTS cp**

course no	subject	ECTS-CP
ENG 4054	Engineering 4054 - Digital VLSI Circuit Design	6
ENG3315	Circuit Theory & Design I	6
ENG 3316	Circuit Theory & Design II	6
MAT 4030	Mathematics 4030 - Probability and Statistics	6
ENG 4539	Professional Practice and Law	6
ENG 3336	Engineering 3336 - Economic Analysis for Engineers	6
		6
PHY 3211	Physics 3211 - Electromagnetic Theory	6
ENG 3558	Engineering 3558 Numerical Methods and Modeling	6
ENG 3334	Control Systems II	6
ENG 4053	Communication Systems	6
ENG 4258	Electric Machines II	6
ENG 3313	Materials Science for Electrical Engineers	6
ENG 4632	Digital Signal Processing	6
ENG 4134	RF Circuits Design	6
	ECTS cp: <u>E</u> uropean <u>C</u> redit <u>T</u> ransfer <u>S</u> ystem <u>c</u> redit <u>p</u> oints	
MECB830i-B	Bachelorthesis-Vorbereitung	3
MECB830i-B	Abschlusskolloquium	3
ENG4969	Degree Project	12



## MECB – Mikromechatronik: Internationale Kooperationen

- Kanada: Ryerson University, Toronto, je 6 ECTS cp

### Microsystems

course no	Subject
GEO702	Technology and the Contemporary Environment
ELE724	CMOS Mixed-Mode Circuits and Systems
ELE734	Low Power Digital Integrated Circuits
COE718	Embedded Systems Design
HST701	Scientific Technology and Modern Society
POL 507	Power, Change and Technology
COE 838	Systems-on-Chip Design
ELE 804	Radio-Frequency Circuits and Systems
ELE 863	VLSI Circuits for Data Communications
ELE 531	Electromagnetics
ELE 532	Signals and Systems I
MTH 514	Probability and Stochastic Processes
ELE 614	CMOS Analog Integrated Circuits
ELE 632	Signals and Systems II

### Robotics

course no	Subject
GEO702	Technology and the Contemporary Environment
MEC 617	Manufacturing System Control
MEC 626	Applied Finite Elements
MEC 813	Flexible Manufacturing Systems
MEC 825	Mechanical Design
ELE 829	System Models and Identification
HST701	Scientific Technology and Modern Society
POL 507	Power, Change and Technology
MEC 830	Mechatronics Systems Design
MEC 813	Flexible Manufacturing Systems
ELE 869	Robotics
ELE 888	Intelligent Systems
MEC 809	Integrated Manufacturing
MEC 816	Fabrication and Tool Engineering
MEC 832	Reliability and Decision Analysis
ELE 709	Real-time Computer Control Systems

### Biomedical

course no	Subject
GEO702	Technology and the Contemporary Environment
POL507	Power, Change and Technology
BME 703	Tissue Engineering
BME 704	Radiation Therapy Devices
BME 705	Rehabilitation Engineering
HST701	Scientific Technology and Modern Society
POL 507	Power, Change and Technology
BME772	Biomedical Signal Analysis
BME809	Biomedical Systems Modelling
BME872	Biomedical Image Analysis
ELE 531	Electromagnetics
ELE 532	Signals and Systems I
MTH 514	Probability and Stochastic Processes
ELE 614	CMOS Analog Integrated Circuits
ELE 632	Signals and Systems II



## MECB – Mikromechatronik: Internationale Kooperationen

- Kanada: UOIT Oshawa, je 6 ECTS cp

UOIT Automotive Engineering			UOIT Electrical Engineering		
course no	subject	ECTS-CP	course no	subject	ECTS-CP
AUTE 3290U	Powertrain Design	6	ELEE 3260U	Power Systems	6
AUTE 3450U	Combustion and Engines	6	ELEE 3180U	Design Principles and Project Management in Electrical Engineering	6
ENGR 3360U	Engineering Economics	6	ENGR 3360U	Engineering Economics	6
MECE 3390U	Mechatronics	6	ELEE 4150U	Advanced Control Systems	6
AUTE 4010U	Vehicle Dynamics and Control	6	ELEE 4420U	DSP Theory and Design	6
AUTE 4060U	Automotive Structural Design	6	ELEE 4750U	Microwave and RF Circuits	6
AUTE 4070U	Chassis Systems Design	6	ELEE 4500U	Wireless Communications	6
MECE 4210U	Advanced Solid Mechanics and Stress Analysis	6	ENGR 4760U	Ethics, Law and Professionalism for Engineers	6
ENGR 4760U	Ethics, Law and Professionalism for Engineers	6	ELEE 4130U	Digital Communications	6
MANE 4045U	Quality Control	6	ELEE 4140U	Power System Protection Relaying	6
ELEE 4350U	Microprocessors	6	ELEE 4115U	Fundamentals of Smart Grid	6
MANE 3460U	Industrial Ergonomics	6	ELEE 4120U	Introduction to Power Electronics	6
MANE 4160U	Artificial Intelligence in Engineering	6	ELEE 4125U	Smart Grid Networking and Security	6
MANE 4380U	Life Cycle Engineering	6	ELEE 4180U	Special Topics in Electrical Engineering	6
MECE 3410U	Electromechanical Energy Conversion	6	ELEE 4190U	Multimedia Systems	6
MECE 3260U	Introduction to Energy Systems	6	ELEE 4930U	Optical Communications	6



• USA: California Polytechnic SLO

Cal Poly SLO	Electrical Engineering	
course no	subject	ECTS cp
EE 306	Semiconductor Device Electronics	4
& EE 346	and Semiconductor Device Electronics Laboratory	2
EE 307	Digital Electronics and Integrated Circuits	6
& EE 347	and Digital Electronics and Integrated Circuits Laboratory	
EE 308	Analog Electronics and Integrated Circuits	6
& EE 348	and Analog Electronics and Integrated Circuits Laboratory	
EE 314	Introduction to Communication Systems	5
EE 328	Discrete Time Signals and Systems	6
& EE 368	and Signals and Systems Laboratory	
EE/CPE 329	Programmable Logic and Microprocessor-Based Systems Design	6
or EE 336	Microprocessor System Design	
EE 335	Electromagnetic Fields and Transmission	6
EE 375	Electromagnetic Fields and Transmission Laboratory	2
EE 402	Electromagnetic Waves	6
EE 409	Electronic Design	6
& EE 449	and Electronic Design Laboratory	
EE 410	Power Electronics I	6
EE 411	Power Electronics II	6
EE 413	Advanced Electronic Design	6
EE 417	Alternating Current Machines	6
EE 420	Sustainable Electric Energy Conversion	6
EE 424	Introduction to Remote Sensing	6
EE/CPE 428	Computer Vision	6
EE 431/CPE 441	Computer-Aided Design of VLSI Devices	6
EE 433	Introduction to Magnetic Design	6
EE 434	Automotive Engineering for a Sustainable Future	6
EE/CPE 439	Introduction to Real-Time Operating Systems	6
EE 495	Cooperative Education Experience 3	6-12
EE 516	Pattern Recognition	6
EE 407	Power Systems Analysis II	6
EE 412	Advanced Analog Circuits	6
EE 415	Communication Systems Design	6
EE 416	Digital Communication Systems	6
EE 418	Photonic Engineering	6

Cal Poly SLO	Electives	
course no	subject	ECTS cp
BMED 410	Biomechanics	6
BMED 420	Principles of Biomaterials Design	6
BMED 425	Biomedical Engineering Transport	6
BMED 430	Biomedical Modeling and Simulation	3
BMED/MATE 435	Microfabrication Laboratory	2
BMED 440	Bioelectronics and Instrumentation	6
BMED 445	Biopotential Instrumentation	6
BUS 311	Managing Technology in the International Legal Environment	6
CHEM 313	Survey of Biochemistry and Biotechnology	6
CPE 482	Advanced Topics in Systems for Computer Engineering	6
CSC 341	Numerical Engineering Analysis	6
CSC/CPE 315	Computer Architecture	6
CSC/CPE 416	Autonomous Mobile Robotics	6
CSC/CPE 453	Introduction to Operating Systems	6
CSC/CPE 454	Implementation of Operating Systems	6
CSC/CPE 458	Current Topics in Computer Systems	6
CSC/CPE 464	Introduction to Computer Networks	6
CSC/CPE 471	Introduction to Computer Graphics	6
ECON 330	International Trade Theory	6
ECON 337	Money, Banking and Credit	6
ECON 403	Industrial Organization	6
ECON 413	Labor Economics	6
ENVE 331	Introduction to Environmental Engineering	6
IME 301	Operations Research I	6
IME 303	Project Organization and Management	6
IME 305	Operations Research II	6
IME 319	Human Factors Engineering	4
IME/HNRS 322	Leadership and Project Management	3
IME 326	Engineering Test Design and Analysis	6
IME 401	Sales Engineering	3
IME 427	Design of Experiments	6
IME 435	Reliability for Design and Testing	4
IME 457	Advanced Electronic Manufacturing	6
IME/MATE 458/CPE 488	Microelectronics and Electronics Packaging	6
MATE 340	Electronic Materials Systems	6
ME 305	Introduction to Mechatronics	6
ME 405	Mechatronics	6
ME 415	Energy Conversion	6
ME 423	Robotics: Fundamentals and Applications	6
ME 450	Solar Thermal Power Systems	6
ME 488	Wind Energy Engineering	6



## MECB – Mikromechatronik: Internationale Kooperationen

### • USA: The Cooper Union, New York City, Manhattan, je 6 ECTS cp

course no	subject	ECTS-cp	course no	subject	ECTS-cp
ECE 300	Communication Theory	6			
ECE 310	Digital Signal Processing	6	EID 120	Foundations of Bioengineering	5
ECE 142	Electronics II	6	EID 121	Biotransport Phenomena	5
ECE 165	Data Structures and Algorithms II	5	EID 122	Biomaterials	5
Ma 352	Discrete Mathematics	6	EID 124	Injury Biomechanics and Safety	5
	Humanities / Sciences Elective	6	EID 131	Energetics (ME131)	5
ECE 303	Communication Networks 3	6	EID 140	Environmental Systems Engineering	5
ECE302	Probability Models & Stochastic Processes 3	6	EID 153	Mechatronics	5
ECE361	Software Engineering & Large System Design	6	EID 160	Acoustics, Noise and Vibration Control	5
	Humanities / Sciences Elective	6	EID 170	Engineering Economy	5
	Non-technical Elective 3	6	EID 320	Special Topics in Bioengineering	5
	Engineering or Science Electives	10	EID 327	Tissue Engineering	5
ME151	Feedback Control Systems	6	EID 325	Science and Application of Bioengineering Technology	5
ME312	Manufacturing Engineering	6	EID 357	Sustainable Engineering and Development	5
ME300-400	Lecture Course (Elective)	6	EID 365	Engineering and Entrepreneurship	5
ME412	Mobile Robots	6	EID 370	Engineering Management	5
ME324	Space Dynamics	6	EID 372	Global Perspectives in Technology Management	5
ME131	Energetics	6	EID 373	Patent Law	5
ME153	Mechatronics	6	EID 374	Business Economics	5
ME160	Engineering Experimentations	6	EID 376	Economics of Alternative Energy	5
ME365	Mechanical Engineering Research Problem	6	EID 362	Interdisciplinary Research Project I	6
ESC161	Systems Eng.	6	EID 363	Interdisciplinary Research Project II	6



## Allg. Verfahren: Outgoing in MEC und FZT:

1. Studierende suchen sich Partnerhochschule aus (für Bachelor-Plus Programm: Rücksprache mit Prof. Gintner als Koordinator)
2. Studierende informieren zuständigen Auslandsbeauftragten;  
→ Vorauswahl geeigneter Studierender:
  - Kriterien: Studienergebnisse, Auftreten, Sprachkenntnisse, i.a. Bachelor-Vorprüfung oder Bachelor-Abschluß (für Master)
3. Studierende informieren AAA (Herrn Schwarz), wobei Zustimmung des Auslandsbeauftragten vorliegt; AAA informiert über Stipendien, Bewerbungsverfahren, etc.
4. Studierende erstellen mit Hilfe der Vorlagen und mit Unterstützung der Studiendekane, Auslandsbeauftragten und Fachkollegen ein Learning-Agreement
5. Während des Auslandsaufenthalts informieren Studierende die Auslandsbeauftragten über den Stand der Dinge
6. Nach Aufenthalt: Bericht über Studienaufenthalt an Auslandsbeauftragten