

# Übersicht der Kurse im Bereich Biomedical Engineering an der TUM /

## Overview of Biomedical Engineering courses at TUM

### Biointerfaces & Materials

Course Type	Course Title	Lecturer(s)
PR	Lab on a Particle	Brischwein & Destgeer
VI	Advanced Microfluidics	Destgeer
PR	Advanced Microfluidics Simulations	Destgeer
VI	Flow Lithography	Destgeer
PR	Blood Gas Analysis Laboratory	Destgeer
VI	Nanotechnology for Energy Systems	Gagliardi
VI	Nanoelectronics	Gagliardi
PR	Python for Engineering Data Analysis – From Machine Learning to Visualization	Gagliardi & Jirauschek
PR <i>[planned]</i>	Stem cell differentiation into functional islets	Hebrok
VI	Materials in Neuroengineering	Kozielski
HS	Seminar Neuroengineering Materials	Kozielski
VO	Introduction to Bioengineering – Bio-inspired Material Design	Lieleg
VO	Designprinzipien in Biomaterialien – die Natur als Ingenieur / Design Principles in Biomatter – Nature as an Engineer	Lieleg
VO	Mikroskopische Biomechanik / Microscopic Biomechanics	Lieleg
VO	Biomaterialcharakterisierung für Ingenieure / Experimental techniques for the characterization of biomatter	Lieleg
PR	Macromolecular Coatings for Biomedical Devices	Lieleg
PR	Praktikum Biophysik für Studenten der Biochemie / Lab course biophysics for students of biochemistry	Lieleg

VO+UE	Bioprinting	Mela
VO+UE	Tissue Engineering and Regenerative Medicine: Fundamentals and Applications	Mela
VO+UE	Medical Technology 1 – an organ system based approach	Mela
VO+UE +SE	Medical Technology 2 – an organ system based approach	Mela
PR	Vascular System	Mela
VO	Patent-, Marken- und Musterrecht für Ingenieure: Eine Einführung / Introduction to Patent, Trademark and Design Law for Engineers	Mela & Wende
VI	Nano- and Microrobotics	Özkale Edelmann
PR	Block course Soft Microrobotics	Özkale Edelmann
PR	Surface Acoustic Waves for Biomedical Applications	Pandey & Destgeer
VI	BioMEMS & Mikrofluidik / BioMEMS & Microfluidics	Wolfrum
PR	Projektpraktikum Elektrochemie und Biosensorik / Project Laboratory Electrochemistry and Biosensors	Wolfrum
PR	Projektpraktikum Mikrofluidik – Entwurf, Fabrikation und Anwendung / Project Laboratory Microfluidics – Design, Fabrication and Application	Wolfrum
PR	Projektpraktikum Brain-Computer Interfaces / Project laboratory Brain-Computer Interfaces	Wolfrum

## Diagnostics

Course Type	Course Title	Lecturer(s)
VO	Regulatory Aspects for MedTech Products	Akra
VO+UE	In Vitro Diagnostik / In Vitro Diagnostics	Brischwein
VO+PR	Lab Course – Molecular and Cellular Diagnostics	Brischwein

PR	Lab on a Particle	Brischwein & Destgeer
VO	Clinical Applications of Computational Medicine	Daumer
VI	Advanced Microfluidics	Destgeer
PR	Advanced Microfluidics Simulations	Destgeer
VI	Flow Lithography	Destgeer
PR	Blood Gas Analysis Laboratory	Destgeer
VO+UE	[BE2] Biomedical Engineering – Organisation von Zellen / Cell Organisation	Hayden
VI	[BE1] Biomedical Engineering – Einführung zur Zellbiologie / Introduction to Cell Biology	Hayden
VI	[BE3] Biomedical Engineering – Diagnostics and Clinical Correlations	Hayden
VI	MedTech Culture – Modular Trainings	Hayden et al.
PR <i>[planned]</i>	Stem cell differentiation into functional islets	Hebrok
VO <i>[planned]</i>	Principles in Laboratory Medicine – An introduction to biochemical diagnostics	Luppa & Weber
VO+UE	Introduction to Bioengineering	Ntziachristos
VO+UE	Introduction to Biological Imaging	Ntziachristos
PR / Other <i>[planned]</i>	Laboratory rounds – Microscopy, Sensors, Imaging	Ntziachristos
PR	Praktikum Charakterisierung mikrofluidischer Systeme / Practical course on microfluidics flow fundamentals	Pandey
PR	Surface Acoustic Waves for Biomedical Applications	Pandey & Destgeer
VO+UE	Aufbau- und Verbindungstechnik in medizinischen, elektronischen Produkten / Packaging and production technologies for medical, electronic products	Rauch

VO	Gassensorik für biomedizinische Anwendungen / Gas sensorics in biomedical applications	Scholz
VO+UE	Microphysiometry	Wiest
VI	BioMEMS & Mikrofluidik / BioMEMS & Microfluidics	Wolfrum
PR	Projektpraktikum Elektrochemie und Biosensorik / Project Laboratory Electrochemistry and Biosensors	Wolfrum
PR	Projektpraktikum Mikrofluidik – Entwurf, Fabrikation und An- wendung / Project Laboratory Microfluidics – Design, Fabrica- tion and Application	Wolfrum
PR	Projektpraktikum Brain-Computer Interfaces / Project laboratory Brain-Computer Interfaces	Wolfrum

## Sensory System Interfaces

Course Type	Course Title	Lecturer(s)
VO+UE +PT	Introduction to Computational Neuroscience	Gjorgjieva
FO	Models in Computational Neuroscience	Gjorgjieva
VO+UE	Scientific computing for Biological Sciences with Matlab	Gjorgjieva
VI	Entwurf von sicheren medizinischen Geräten und Baugruppen / Design of Safe Medical Devices and Boards	Gleich
VI	Biostatistik / Biostatistics	Gleich
FO	Projektpraktikum Verstärkerschaltungen zur Messung bio- elektrischer Signale / Practical Course development of bio-signal amplifiers	Gleich
VI	Systemtheorie der Sinnesorgane / System Theory of the Senses	Hemmert
VI	Neuroprosthetics	Hemmert
SE	Neuroprosthetics: Artificial Limbs	Piazza
SE	Master-Seminar – Rehabilitation Robotics	Piazza

VI	The Auditory System	Seeber
VO+PR	Signalverarbeitung für die Audiotechnik / Signal Processing for Audio Technology	Seeber
VI	Audiokommunikation / Audio Communication	Seeber
SE	Topics in Audio Information Processing Research	Seeber
HS	Hauptseminar Audio-Informationsverarbeitung / Seminar on audio information processing	Seeber
VO	Computational Neuroscience: Eine Ringvorlesung von Modellen bis zu Anwendungen / A Lecture Series from Models to Applica- tions	Seeber et al.
VI	Communication Acoustics	Seeber et al.
PR	Computational Haptics Laboratory	Steinbach
VI	Digital Signal Processing	Steinbach
VO <i>[planned]</i>	Audiology	Wimmer
VO+UE <i>[planned]</i>	Digital signal processing primer for medical students	Wimmer

### Kursarten / Course Types

FO: Forschungspraktikum / research lab training

HS: Hauptseminar / advanced seminar

PR: Praktikum / practical training

PT: Projekt / project

SE: Seminar / seminar

UE: Übung / exercise

VI: Vorlesung mit integrierten Übungen / lecture with integrated exercises

VO: Vorlesung / lecture