

Module	<b><i>Biophysics: Fundamentals</i></b>
Code	71654
Instruction language	English
ECTS credits	6
Attendance time	6 hours per week
Duration	1 semester
Cycle	Each winter semester
Coordinator	Prof. Dr. Jens Michaelis
Instructors	Prof. Dr. Christof Gebhardt, Prof. Dr. Jens Michaelis
Allocation to study programmes	Physics M.Sc., elective module, 1 <sup>st</sup> or 2 <sup>nd</sup> semester Wirtschaftsphysik M.Sc., elective module, 1 <sup>st</sup> – 3 <sup>rd</sup> Semester
Formal prerequisites	None
Recommended prerequisites	Molecular physics, condensed matter physics
Learning objectives	Students who have successfully completed this module, <ul style="list-style-type: none"> <li>• understand the basic terms and concepts of biophysics.</li> <li>• be able to describe with simple physical models biophysical phenomena.</li> </ul>
Syllabus	In this module, the following specialist topics will be covered: <ul style="list-style-type: none"> <li>• Time and length scales in biophysics</li> <li>• Physics of small Reynold's numbers</li> <li>• Introduction to polymer models for the description of biomolecules</li> <li>• Design and structure of cellular components as well as methods of structure determination</li> <li>• Fluorescence spectroscopy and microscopy</li> <li>• Bacteria movement, diffusion</li> <li>• Force Spectroscopy</li> </ul>
Literature	<ul style="list-style-type: none"> <li>• Phillips, Kondev, Theriot: Physical Biology of the Cell, Garland Science</li> <li>• Howard: Mechanism of Motor Proteins and the Cytoskeleton, Sinaur and Associates</li> <li>• Lakowicz: Principles of Fluorescence Spectroscopy, Springer US</li> </ul>
Teaching and learning methods	Lecture (4 hours per week) Laboratory course (4 hours per week)
Workload	60 hours lecture (attendance time) 30 hours exercises (attendance time) 90 hours self-study and exam preparation Total: 180 hours
Assessment	Written or oral examination. A prerequisite for the participation in the examination is an ungraded course achievement. Form and scope of the



	examination and of the course achievement are determined and notified by the instructor at the beginning of the course.
Examination	12083 Biophysics: Fundamentals (prerequisite) 11951 Biophysics: Fundamentals
Grading procedure	The module mark is the examination mark.
Basis for	Modules Biophysics: Gene Expression and Biophysics: Molecular Motors