

# BIOLOGY - BIOMATERIALS

Introductory Biology and Cell Biology

Module assigned to 1<sup>st</sup> semester

Identification Code	2288870
ECTS-Points	5
Credit Hours	4
Language	English
Length of the Module	1 semester
Date and Capacity	winter term 30 students
Responsible Lecturer	Prof. Dr. Bernhard Koch
Further Lecturer	Prof. Dr. Bernhard Koch, Prof. Dr. Paul Walther, PD Dr. Andreas Ziegler
Study Programme	Master degree in Advanced Materials Compulsory for students with major Biomaterials Elective for students with major Nanomaterials
Prerequisites	BSc degree
Study Objectives	The students should - be able to understand central problems of Biology and Cell Biology. - be well prepared to for lectures in Biomaterials in 2 <sup>nd</sup> and 3 <sup>rd</sup> semester
Module Contents	<p><b>BASICS AND ECOSYSTEMS</b> Secondary production in ecosystems The cycling of chemical elements in ecosystems</p> <p><b>BIOMOLECULES</b> Water and the fitness of the environment Carbon and the molecular diversity of life Structure and function of macromolecules Introduction to metabolism, Enzymes</p> <p><b>CELLULAR RESPIRATION</b> Harvesting chemical energy</p> <p><b>CELL MORPHOLOGY AND GENEXPRESSION</b> A tour of the cell Membrane structure and function The cell cycle The molecular basis of inheritance From gene to protein</p> <p><b>ORGANISMIC AND ANIMAL DIVERSITY</b> The major lineages of life Prokaryotes and the origins of metabolic diversity The origin and early diversification of eukaryote details from animal evolution and groups of invertebrates</p> <p><b>DEVELOPMENT</b> Animal development</p> <p><b>FUNCTIONAL ANATOMY</b> An introduction to animal structure and function muscle function Nervous system</p> <p><b>ENDOCRINOLOGY</b> Chemical signals in animals Blood glucose and adrenal gland</p> <p><b>CIRCULATION AND GAS EXCHANGE</b> Circulation and gas exchange Gas exchange in animals Intracellular Compartments and Protein Sorting Vesicular Transport Cytoskeleton and Mitosis</p> <p>Structure and function of cellular membranes</p>

	<p>Cell-cell contacts and cell adhesion  Structure and function of the extracellular matrix  <b>CELLULAR CIRCULATION AND GAS EXCHANGE</b>  Circulation and gas exchange Gas exchange in animals  Intracellular Compartments and Protein Sorting Vesicular Transport  Cytoskeleton and Mitosis  Structure and function of cellular membranes  Cell-cell contacts and cell adhesion  Structure and function of the extracellular matrix  <b>CELLULAR RESPIRATION</b>  Harvesting chemical energy  <b>CELL MORPHOLOGY AND GENEXPRESSION</b>  A tour of the cell  Membrane structure and function  The cell cycle  The molecular basis of inheritance  From gene to protein  <b>ORGANISMIC AND ANIMAL DIVERSITY</b>  The major lineages of life  Prokaryotes and the origins of metabolic diversity  The origin and early diversification of eukaryote  details from animal evolution and groups of  invertebrates  <b>DEVELOPMENT</b>  Animal development  <b>FUNCTIONAL ANATOMY</b>  An introduction to animal structure and function  muscle function  Nervous system  <b>ENDOCRINOLOGY</b> Chemical signals in animals Blood glucose and adrenal  gland  <b>CIRCULATION AND GAS EXCHANGE</b> Circulation and gas exchange Gas  exchange in animals  Intracellular Compartments and Protein Sorting Vesicular Transport  Cytoskeleton and Mitosis  Structure and function of cellular membranes  Cell-cell contacts and cell adhesion  Structure and function of the extracellular matrix</p>
Literature	<p>Handouts</p> <p>N. A. Campbell, J. B. Reece: BIOLOGY, Benjamin Cummings Publisher, 6th  edition (2002)</p>
Teaching Methods	Introductory Biology and Cell Biology (L), 4 h/week
Estimation of working load	<p>55 h lecture (presence)  79 h preparation and postprocessing lecture  16 h exam preparation  Total: 150 h</p>
Examinations	examination of 120 min
Grade Composition	Exam result
Usability	MSc course of studies Advanced Materials Biomaterials