

Modul BTB-0333 Biochemistry 2

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| 1 | Module Number 0333 | Study Programme BTB | Semester 3 | Offered in <input checked="" type="checkbox"/> WS <input checked="" type="checkbox"/> SS | Duration 1 Semester | Module Type Required | Workload (h) 330 | ECTS Points 11 |
| 2 | Courses | | Teaching and Learning Forms | | Contact Time | | Self-Study Time | Language |
| | a) Biochemistry 2 | | Lecture | | (SWS) 2 | (h) 30 | (h) 180 | German |
| | b) Laboratory Biochemistry | | Lab | | 6 | 90 | | English |
| | c) Introduction to molecular biology | | Lecture (only summer term) | | 2 | 30 | | German |
| | | | | | | [1 SWS = 15h] | | |
| 3 | <p>Learning Outcomes and Competences Once the module has been successfully completed, the students can...</p> <p>Knowledge and Understanding</p> <ul style="list-style-type: none"> understand and describe the central chemical reactions of the metabolism of most living organisms. (a) understand and explain basic methods for the isolation of important biomolecules, such as DNA, proteins and lipids from biological samples. (b) understand and explain basic methods for the analysis of biomolecules. (b) learn and understand basics of molecular biology. (c) <p>Use, Application and Generation of Knowledge</p> <p><i>Use and Transfer</i></p> <ul style="list-style-type: none"> recognize the significance of cellular metabolic pathways for the cultivation of microorganisms and mammalian cells in practice. (a) apply the acquired biochemical methods in practice. (b) analyse results obtained in the laboratory and derive or develop solutions. (b,c) create technical reports and presentations (a,b,c) familiarize themselves with new ideas and topics based on their basic knowledge. (a,b,c) <p><i>Scientific Innovation</i></p> <ul style="list-style-type: none"> use biochemical methods and tools to gain new insights in the field of biochemistry, biotechnology and neighbouring areas. (a,b,c) independently develop approaches for new concepts and assess their suitability. (a,b,c) <p>Communication and Cooperation</p> <ul style="list-style-type: none"> interpret technical results and draw admissible conclusions. (a,b,c) present technical contents and discuss them. (a,b,c) communicate and cooperate within the group in order to find adequate solutions for the task at hand. (a,b,c) <p>Scientific Self-Conception/ Professionalism</p> <ul style="list-style-type: none"> derive recommendations for decisions from a social and ethical perspective on the basis of the analyses and evaluations made. (b) justify developed solutions theoretically and methodically. (b) reflect and assess one's own abilities in a group comparison. (a,b,c) | | | | | | | |

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| 4 | <p>Contents</p> <p>a) Lecture Biochemistry 2 (2 ECTS):</p> <ul style="list-style-type: none"> • Enzymes and enzyme kinetics • Ten central metabolic pathways, which are typical of most living organisms • Methods of biochemistry <p>b) Laboratory Biochemistry (7 ECTS):</p> <ul style="list-style-type: none"> • Buffer systems • Pipetting and Photometry • Methods for the analysis of sugar molecules, lipids, nucleic acids, amino acids, proteins and enzymes • Enzyme kinetics • Methods of chromatography to isolate and purify proteins from biological samples • Immunochemistry <p>c) Lecture Introduction to molecular biology (2 ECTS):</p> <ul style="list-style-type: none"> • Historical development of genetics • Cells as fundamental components of life • DNA replication, DNA damage and repair mechanisms, forms of DNA organization • Mechanisms of transcription in prokaryotes and eukaryotes, reverse transcription • Genetic code and mechanisms of translation |
| 5 | <p>Participation Requirements</p> <p>compulsory: Module Biochemistry 1, module Organic Chemistry and lecture Biologie</p> |
| 6 | <p>Examination Forms and Prerequisites for Awarding ECTS Points</p> <p>a) Lecture: Written examination (90 minutes, graded) ;</p> <p>b) Lab: Passing all experiments including written reports (not graded, 7 ECTS Points). Lab takes place on Thursdays (11:30-17:00 o'clock).</p> <p>c) Written examination (60 minutes, graded)</p> |
| 7 | <p>Further Use of Module</p> <p>Mandatory module for Bachelor in Biotechnology</p> |
| 8 | <p>Module Manager and Full-Time Lecturer</p> <p>Prof. Dr. Cristina Maria Sirrenberg-Cruciat / Prof. Dr. Dirk Schwartz</p> |
| 9 | <p>Literature</p> <p>Jan Koolman und Klaus-Heinrich Röhm: „Taschenatlas Biochemie des Menschen“, Thieme-Verlag, 4. Auflage, 2009</p> <p>Jeremy M. Berg, John L. Tymoczko und Lubert Stryer: „Stryer Biochemie“, Springer Spektrum Verlag, 7. Auflage, 2014</p> <p>Alberts, Johnson, Lewis, Morgan, Raff, Roberts and Walter: „Molecular Biology of the Cell“, Garland Science, 6th Edition, 2015</p> <p>Lecture notes and practical training notes</p> |
| 10 | <p>Last Update</p> <p>23.01.2024</p> |