

<b>Program of Studies:</b>	<b>Master Program Bioinformatics</b>
<b>Name of the module:</b>	<b>Special-topic Lecture Biosciences: Bioanalytics (Bioanalytical Chemistry)</b>
<b>Abbreviation:</b>	<b>B-M-5</b>
<b>Subtitle:</b>	-
<b>Modules:</b>	Lecture and tutorial „Bioanalytics“
<b>Semester:</b>	1st – 3rd semester
<b>Angebotsturnus:</b>	
<b>Responsible lecturer:</b>	Prof. Dr. Dietrich Volmer
<b>Lecturer:</b>	Prof. Dr. Dietrich Volmer
<b>Language:</b>	German
<b>Level of the unit/ Mandatory or not :</b>	Graduate course / mandatory elective
<b>Course type/weekly hours:</b>	Lecture: 2 h (weekly) Tutorial: 1 h (weekly)
<b>Total workload:</b>	150 h = 45 h of classes and 105 h private study
<b>Credits:</b>	5
<b>Entrance requirements:</b>	Basics of instrumental analytics Basics of organic chemistry and biochemistry
<b>Aims/Competences to be developed:</b>	Comprehension of the characteristics of biological molecules in regard to the applicability of different methods to their separation, isolation, and information about their structure. Specifics of biological macromolecules at the separation and structural analysis.

<b>Content:</b>	<ul style="list-style-type: none"> <li>- Physical-chemical characteristics of biomolecules, their applicability at their separation by different separating mechanisms (chromatography, electrophoresis) and structural analysis (wet chemical Methods, nuclear magnetic resonance, mass spectrometry).</li> <li>- Protein analytics: chromatographic and electrophoretic separation and analysis, peptide-mapping, detection of post-translational modifications, ESI-mass spectrometry and MALDI-mass spectrometry of peptides and proteins, protein sequence analysis, 3-D-structural information of NMR, bioinformatical tools in proteom analysis, applications in proteom analysis</li> <li>- Nucleic acid analytics: chromatographical and elektrophoretical separation and analysis, digestion by restriction encymes and polamerase-chain reaction, ESI-mass spectrometrie and MALDI-mass spectrometrie of nucleioc acids, DANN-sequence analysis, methods for the detection of mutations, bioinformatical tools in genome analysis, application in forensics and medicinal diagnostics</li> <li>- Carbohydrate analysis: determination of sugar building blocks, chromatographic and electrophoretical separation Mass spectrometry, analysis of polysaccharides and glyco-proteins.</li> </ul>
<b>Assessment/Exams:</b>	Written exam
<b>Literature:</b>	<ul style="list-style-type: none"> <li>- Lösung von bereitgestellten Übungsaufgaben, Bioanalytik (Lottspeich, 2006, Spektrum)</li> <li>- Instrumentelle Analytik (Skoog &amp; Leary, 1996, Springer)</li> <li>- Mass Spectrometry (Hoffmann &amp; Stroobant, 2007, Wiley)</li> </ul>