

<b>Georg-August-Universität Göttingen</b>		6 C 4 WLH
<b>Module M.iPAB.0017: Applied Bioinformatics with R</b>		
<p><b>Learning outcome, core skills:</b></p> <p>This module will cover the fundamental concepts of bioinformatics. Topics will include usage of relevant/modern biological databases and tools that are required to perform different analyses. Further, an introduction to multi-omics-data will be given, including genome, transcriptome and proteome analysis. This module aims to teach interested students fundamental analysis skills to evaluate biological data using bioinformatic techniques, and to become proficient in performing such analyses.</p> <p>In more detail, following topics will be treated:</p> <ul style="list-style-type: none"> <li>• Analysis of multi-omics data</li> <li>• Standard databases in bioinformatics</li> <li>• DNA sequence and genome analysis</li> <li>• Variant calling techniques</li> <li>• Sequence alignment</li> <li>• Gene regulatory network analysis</li> <li>• Clustering</li> </ul> <p>The lecture will be based on the analysis of real data sets from agricultural research projects as far as possible.</p>		<p><b>Workload:</b></p> <p>Attendance time: 56 h</p> <p>Self-study time: 124 h</p>
<p><b>Course: Applied Bioinformatics with R</b> (Lecture, Exercise)</p> <p><i>Contents:</i></p> <p>The course consists of lectures, exercises and a project work. After the lectures and the exercises the students will have to carry out a project work that must be finished within ten weeks after the end of the lectures. The students as well as the other research groups are welcome to suggest topics, possibly questions related to their master thesis can be treated. The project work should be a concise written report of about ten pages in which one or several of the techniques that were treated in the course are applied.</p>		4 WLH
<p><b>Examination: Oral examination (approx. 20 minutes, 75%) and term paper (max. 10 pages, 25%)</b></p> <p><b>Examination requirements:</b></p> <ul style="list-style-type: none"> <li>• Knowledge about the fundamental concepts of bioinformatics</li> <li>• Knowledge about different databases in bioinformatics</li> <li>• Analysis of biological data, interpretation and modeling of biological information and applying this to the solution of biological problems in any area involving molecular data.</li> </ul>		6 C
<p><b>Admission requirements:</b></p> <p>none</p>	<p><b>Recommended previous knowledge:</b></p> <p>Basic knowledge of R</p>	
<p><b>Language:</b></p> <p>English</p>	<p><b>Person responsible for module:</b></p> <p>Prof. Dr. Armin Schmitt</p>	
<p><b>Course frequency:</b></p> <p>each winter semester</p>	<p><b>Duration:</b></p> <p>1 semester[s]</p>	

<b>Number of repeat examinations permitted:</b> twice	<b>Recommended semester:</b>
<b>Maximum number of students:</b> 30	