




**Bonn International Graduate School
Land and Food**



	Bonn International Graduate School Land and Food	
	Applied Bioinformatics	
Coordinator(s)	Heiko Schoof	
Instructor(s)	Heiko Schoof, Florian Boecker, Lucia Vedder, Tyll Stöcker, Carolin Uebermuth-Feldhaus	
Course Description	<p>This practical course will develop basic scientific computing skills and apply them to a standard use case in bioinformatics, RNA-seq data analysis. We will analyse a Next Generation Sequencing dataset measuring genome-wide gene expression.</p> <p>Aim: Introduce to the reproducible application of current bioinformatics methods to high-throughput data analysis</p> <p>We will:</p> <ul style="list-style-type: none"> – not hide the ugly details – use state-of-the-art algorithms – work on single data sets using methods that scale to dozens of data sets – focus on technical skills – use high performance computing infrastructure – not introduce programming new algorithms – not discuss algorithms or introduce various methods 	
Course Outline	<ul style="list-style-type: none"> -introduction to Unix and parallel computing -QC (fastQC), trim and filter (trimmomatic), map to reference (HISAT2) -view mapping (IGV), assemble transcripts (FeatureCount) -introduction to the statistics package R-expression counts, differential expression (edgeR) -expression plots and analyses (R, Mapman) -interpretation and documentation -exam 	
Requirements	Basic skills in R, background in molecular biology	
Credit Points 6	Teaching Methods	
	Lectures Practical computer work	Percentage 20% 80%
Grading	Test on June 8 th .	
References	Marcon et al., Plant Physiol. 2017 Feb; 173(2): 1247–1257.	
Organization and time	2021, January 24 th to 2022, February 4 th , Monday-Friday 10:00-17:00 Zoom	
Language	English	
Remarks	Register by email to cropbio@uni-bonn.de	