

Module Name Population Genetics and Molecular Evolution						
Type of Module ○ Advanced Module				Module Code Population Genetics		
Identification Number	Workload	Credit Points	Term	Offered Every	Start	Duration
MN-B-SM (C 1)	360 h	12 CP	2 nd term of studying	Summer term, 1 st half	Summer term only	7 weeks
1	Course Types		Contact Time		Private Study	
	a) Lectures		48 h		96 h	
	b) Practical/Lab		48 h		127 h	
	c) Seminar		5 h		36 h	
2	Module Objectives and Skills to be Acquired Students who successfully completed this module <ul style="list-style-type: none"> • have acquired detailed knowledge on fundamental concepts and theoretical models in population genetics and molecular evolution. • are able to measure, statistically evaluate and interpret genetic data and put these in the context of molecular evolution. • are skilled in the analysis of polymorphism data from natural populations and can independently carry out small scientific projects related to the topic of the module. • have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level. • are able to transfer skills acquired in this module to other fields of biology. 					
3	Module Content <ul style="list-style-type: none"> • Principles of population genetics, population genomics and molecular evolution • Statistical tests of evolutionary hypotheses • Mathematical modeling • Intra- and interspecific comparative analyses of genome sequences • Analysis of gene variant and expression data • Work with polymorphism data (e.g., VCF file format and VCF-tools) 					
4	Teaching Methods <ul style="list-style-type: none"> • Lectures; Practical; Seminar; Computer exercises; Guidance to independent research; Training on presentation techniques in oral and written form 					
5	Prerequisites (for the Module) Enrollment in the Master's of Science degree course "Computational Biology" or in the Master's degree course "Computational Sciences" or "Informatik" Additional academic requirements Previous attendance of the lecture module Computational Biology; Good mathematical and quantitative skills are highly recommended.					

6	Type of Examination The final examination consists of two parts: Oral examination on topics of lectures, seminars and the practical/lab part (30 min; 50 % of the total module mark) written report (= portfolio, 50 % of the total module mark)
7	Credits Awarded Regular and active participation; Each examination part at least “sufficient” (see appendix of the examination regulations for details)
8	Compatibility with other Curricula Optional compulsory module in the Master’s degree course “Computational Sciences” or “Informatik”
9	Proportion of Final Grade 12.0 %
10	Module Coordinator Prof. Dr. Thomas Wiehe, phone 470 1588, e-mail: twiehe@uni-koeln.de
11	Further Information Participating faculty: Dr. A. Fulgione, Prof. Dr. M. Nothnagel, Prof. Dr. T. Wiehe Literature: <ul style="list-style-type: none">Information on recommended textbooks and other reading material will be given on the ILIAS representation of the course (see https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html) General time schedule: Weeks 1-6 (Mon., Wed., Fri.): Lectures (9-11), practical/lab (14-16), writing portfolio (= weekly home work exercises) and preparation for the seminar talk (held in week 6); Week 7 (Mon.-Fri.): Preparation for the oral examination Note: The module contains computer-based practicals/research as a main component. Introduction to the module: April 7, 2025 at 9:15 a.m., Center for Molecular Biosciences (COMB), Computer pool (ground floor) Oral examination: May 23, 2025; second/supplementary examination August 15, 2025; dates may vary if students and module coordinator agree. More details will be given at the beginning of the module.