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# DATA MANAGEMENT FOR QUANTITATIVE BIOLOGY

## BIOINF 4399C (6 ECTS CREDITS)

SUMMER 2017

THU 4-6 (LECTURE)

AUF DER MORGENSTELLE 16 (HSZ),  
VBN3

WED 4-6 (PROBLEM SESSION)

AUF DER MORGENSTELLE 16 (HSZ),  
VBN3

INSTRUCTOR: DR. SVEN NAHNSEN  
E-MAIL: DMQB-SS17@INFORMATIK.UNI-TUEBINGEN.DE  
PHONE: 29-72163  
OFFICE: P43, AUF DER MORGENSTELLE 10  
OFFICE HOURS: THU, 14-15

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### OVERVIEW

THE LECTURE CONVEYS KEY CONCEPTS FOR THE DATA MANAGEMENT IN QUANTITATIVE BIOLOGY AND BIOMEDICINE. THE FIRST PART OF THE COURSE WILL INTRODUCE THE MAIN DATA SOURCES THAT HAVE EMERGED OVER THE LAST YEARS IN BIOMEDICAL RESEARCH PROJECTS, RANGING FROM CLASSICAL EXPERIMENTS TO NEXT-GENERATION GENOME-SCALE TECHNOLOGIES; WE WILL ALSO COVER DIFFERENT CONCEPTS FOR STORING, ACCESSING, ANALYZING AND ARCHIVING SUCH DATASETS. THE SECOND PART OF THE COURSE WILL FOCUS ON BIG DATA METHODS FOR DEALING WITH HUGE AND COMPLEX AMOUNTS OF DATA, AS WELL AS ON PUBLIC DATA REPOSITORIES AND STATE-OF-THE-ART INTEGRATED CONCEPTS FOR THE DATA MANAGEMENT.

### GOALS

- ENABLE STUDENTS TO WORK ON DATA MANAGEMENT PROJECTS IN BIOMEDICAL RESEARCH
- APPLY STATE-OF-THE-ART METHODS AND TOOLS FOR THE MANAGEMENT AND ANALYSIS OF GENOME-SCALE DATA
- DESIGN DATA MANAGEMENT ARCHITECTURES AND USE BIOINFORMATICS WORKFLOW SYSTEMS
- WORK ON RESEARCH QUESTIONS INDEPENDENTLY AND IN A TEAM

### REQUIREMENTS

- PARTICIPATION IN THE WEEKLY PROBLEM SESSIONS
- SOLVE QUESTIONS DISTRIBUTED ON WEEKLY ASSIGNMENT SHEETS

### EVALUATION

PASSING REQUIRES A GRADE OF 4.0 OR BETTER FOR THE EXAM AS WELL AS THE ASSIGNMENTS AND PROJECT. BONUS POINTS FOR THE OVERALL GRADE CAN BE OBTAINED THROUGH EXCEPTIONAL WORK IN THE PROJECT OR THE ASSIGNMENTS.

ASSIGNMENTS WILL HAVE TO BE WORKED ON INDIVIDUALLY. WE WILL CHECK THE SOLUTIONS FOR DUPLICATES AND RESERVE THE RIGHT TO DISTRIBUTE POINTS ACROSS ALL IDENTICAL SOLUTIONS. STUDENTS CAUGHT COPYING SOLUTIONS CAN BE EXCLUDED FROM THE COURSE. PROJECT WORK WILL BE DONE IN TEAMS OF 2-3 STUDENTS. HERE, TEAMWORK IS REQUIRED.

### MATERIALS

SLIDES WILL BE HANDED OUT AT THE BEGINNING OF EACH LECTURE. MATERIALS WILL BE MADE AVAILABLE AT THE WEBSITE OF THE LECTURE:

[HTTP://ABI.INFO.UNI-TUEBINGEN.DE/TEACHING/SS-17](http://abi.inf.uni-tuebingen.de/teaching/ss-17)

### KEY DATES

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APRIL 20

INTRODUCTION/FIRST LECTURE

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APRIL 27

FIRST PROBLEM SESSION

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JULY 21

ORAL EXAMS (SCHEDULED INDIVIDUALLY)