

<b>Name of Module:</b> Computational Biology		<b>CP (ECTS):</b> 6	<b>Short Name:</b> MINF-IS-ComBio.W12
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<b>Module Description</b>			

### 1. Qualification Aims

The module conveys the necessary background knowledge in molecular and cell biology for students to conduct research in the area of computational structural biology. Special emphasis is given to topics in the intersection of computer science and molecular biology. The course introduces relevant algorithms and concepts from computational biology, computer science, robotics, optimization, etc.

The course is **principally** designed to impart  
technical skills **40%**, method skills **40%** system skills **10%** social skills **10%**

### 2. Content

Cellular biology, molecular biology, genomics, proteomics, DNA, RNA, protein structure prediction, protein docking, protein design, optimization, dynamic programming, statistics.

### 3. Module Components

Course Name	Course type	Weekly hours per semester	CPs (according to ECTS)	Compulsory(C) / Compulsory Elective (CE)	Semester (WiSe / SoSe)
Computational Biology VL and UE	IV	4	6	P	WiSe

### 4. Description of Teaching and Learning Methods

Course consists of lecture and applied programming exercises.

### 5. Prerequisites for Participation

C++ programming skills; no prior knowledge of biology is required

### 6. Target Group of Module

Master students in Computer Science / Focus Intelligent Systems  
Master students in Computer Engineering / Focus Information Systems  
Master students in Computer Engineering StO/PO 2012:  
Focus Cognitive Systems and Robotics; Computer Science  
Focus Information Systems, Computer Science

### 7. Work Requirements and Credit Points

Course Type	Calculation Factor	Hours
Presence in lectures	4 * 15	60
Pre- and postpreparation of classes	2 * 15	30
Assignments	4 * 15	60
Exam preparation		30
		180

### 8. Module Examination and Grading Procedures

Exam-equivalent study effort consisting of programming exercises, written exercises, and a written exam at the end of the module; admission for the written exam is only granted if all exercises have been completed in a timely fashion; the grade of the module is determined based on the grade of the exercises (50%) and the exam (50%). To pass the class the student has to pass each individual component.

### 9. Duration of Module

The module can be completed in 1 semester.

### 10. Number of Participants

Registration required due to limited number of participants, see <http://www.robotics.tu-berlin.de/menue/lehre/>

### 11. Enrolment Procedures

See <http://www.robotics.tu-berlin.de/menue/lehre/>  
Registration for the exam in compliance with regulations; further information is provided in the lecture.

### 12. Recommended Reading, Lecture Notes

Lecture notes available in paper form?      yes       no   
Lecture notes in paper form are sometimes made available during class.  
Lecture notes available in electronic form?      yes       no   
If yes, please specify web address: announced in the course

#### **Recommended Reading:**

Announced in the course

### 13. Other Information

The language of the module is English. Computational Biology 0433 L 412 can only be taken in conjunction with this lecture.