Module Description

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 50%, method skills 40% system skills 10% social skills 0%

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

3. Module Components

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Course type</th>
<th>Weekly hours per semester</th>
<th>CPs (according to ECTS)</th>
<th>Compulsory(C) / Compulsory Elective (CE)</th>
<th>Semester (WS / SS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational Biology VL and UE (0433 L 410 and 411)</td>
<td>IV</td>
<td>4</td>
<td>6</td>
<td>P</td>
<td>WS</td>
</tr>
</tbody>
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4. Description of Teaching and Learning Methods
Course consists of lecture and applied programming exercises.

5. Prerequisites for Participation
Prior knowledge of biology is not required.

6. Target Group of Module
Master students in Computer Science / Focus Intelligent Systems
Master students in Computer Engineering / Focus Information Systems
7. Work Requirements and Credit Points

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Calculation Factor</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence in lectures</td>
<td>5 * 15</td>
<td>60</td>
</tr>
<tr>
<td>Pre- and postpreparation of classes</td>
<td>2 * 15</td>
<td>30</td>
</tr>
<tr>
<td>assignments</td>
<td>4 * 15</td>
<td>60</td>
</tr>
<tr>
<td>Exam preparation</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>180</td>
</tr>
</tbody>
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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 [x]
If yes, where can they be purchased?
Lecture notes in paper form are sometimes made available during class.
Lecture notes available in electronic form? yes [x] no [ ]
If yes, please specify web address: announced in the course

Recommended Reading:
Announced in the course

13. Other Information

The language of instruction is English.
The part Computational Biology 0433 L 412 of the course does not qualify for credit (these are supplementary lectures in support of the programming exercises).