Name of Module: Computational Biology
CP (ECTS): 6
Short Name: MINF-IS-ComBio.W12

Person Responsible for Module: Oliver Brock
Secretariat: EN10
e-mail address: oliver.brock @ tu-berlin.de

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 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

<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 (WiSe / SoSe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational Biology VL and UE</td>
<td>IV</td>
<td>4</td>
<td>6</td>
<td>P</td>
<td>WiSe</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Calculation Factor</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence in lectures</td>
<td>4 * 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>
</table>

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

<table>
<thead>
<tr>
<th>Lecture notes available in paper form?</th>
<th>yes ☑</th>
<th>no ☒</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture notes in paper form are sometimes made available during class.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture notes available in electronic form?</td>
<td>yes ☒</td>
<td>no ☐</td>
</tr>
<tr>
<td>If yes, please specify web address: announced in the course</td>
<td></td>
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</tr>
</tbody>
</table>

**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.