This course introduces several core topics in bioinformatics and computational biology. Each topic will be discussed from three aspects: 1) motivation and concepts, 2) computational problems and methods, and 3) available tools and data. The topics include basics in molecular biology, high-throughput experiments and data preprocessing, sequencing and alignment, motifs and domains, ontology and functional enrichment, biological networks and data mining, secondary and tertiary structures, and other latest developments in this research area.

Bioinformatics and Computational Biology 生物資訊及計算生物學

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.
D

MARGINAL - performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

F

FAILURE - performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

Equivalent Offering:

Units:
3 (Min) / 3 (Max) / 3 (Acad Progress)

Grading Basis:
Graded

Repeat for Credit:
N

Multiple Enroll:
N

Course Attributes:
MSc Computer Science
MPhil-PhD Computer Sci & Erg

Topics:

COURSE OUTCOMES

Learning Outcomes:
At the end of the course of studies, students will have acquired the ability to
1. explain the concepts and basic methods related to a broad range of topics in bioinformatics;
2. apply what they have learned based on hands-on experience in using existing tools and locating, processing and analyzing some available data;
3. work and research in bioinformatics-related areas.
Course Syllabus:

This course introduces several core topics in bioinformatics and computational biology. Each topic will be discussed from three aspects: 1) motivation and concepts, 2) computational problems and methods, and 3) available tools and data. The topics include basics in molecular biology, high-throughput experiments and data preprocessing, sequencing and alignment, motifs and domains, ontology and functional enrichment, biological networks and data mining, secondary and tertiary structures, and other latest developments in this research area.

Assessment Type:

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<thead>
<tr>
<th>Assessment Type</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Essay test or exam</td>
<td>30%</td>
</tr>
<tr>
<td>Others</td>
<td>40%</td>
</tr>
<tr>
<td>Presentation</td>
<td>30%</td>
</tr>
</tbody>
</table>

Feedback for Evaluation:

1. Course evaluation and questionnaire
2. Reflection of teachers
3. Question-and-answer sessions during class
4. Student consultation during office hours or online

Required Readings:

To be provided by course teacher.

Recommended Readings:

This course does not have any text book. Students will read some latest research papers for class discussions and course project. Here is a list of papers used before. The exact list to be used will be revised every year.

For students in MSc Computer Science; or
For students in MPhil-PhD Computer Science & Engineering; or
For students in UG Computer Science; or
For students in UG Computer Engineering

CAF

<END OF REPORT>