Items of Course Outlines

1. Instructor (s) – Name and Contact Details
   Jiguang Wang, jgwang@ust.hk

2. Teaching Assistant (s) - Name and Contact Details
   Hanli Huang, hanli.huang@connect.ust.hk
   Jiabao Li, jligm@connect.ust.hk
   Dong Song, dong.song@connect.ust.hk (To be confirmed)
   Yingxi Yang, yyangea@connect.ust.hk (To be confirmed)

3. Meeting Time and Venue – Lectures, Tutorials/ Laboratory
   Monday/Wednesday 10:30AM - 11:50AM - Lectures: 951 3237 4447 (pwd: biodata)
   Monday 12:00PM - 12:50PM - Tutorials: 947 9491 6784 (pwd: biodata)

4. Course Description - Credit Points, Pre-requisite, Exclusion, Brief Information/synopsis
   •Credit points: 3
   •Prerequisites:
     o For LIFS 4320
       ▪ 1. COMP 1021 or COMP 1022P or COMP 1022Q or COMP 2011;
       ▪ 2. MATH 2411 or LIFS 3150 or ISOM 2500;
       ▪ 3. LIFS3140
     o For BIEN 3320
       ▪ 1. COMP 1021 or COMP 1022P or COMP 1022Q or COMP 2011;
       ▪ 2. MATH 2411 or ISOM 2500;
       ▪ 3. BIEN2610
       ▪ 4. BIEN2310
   •Exclusions: NIL
   •Brief description: This is an introductory course for the application of data science in biology and medicine. The course will introduce the fundamental principles on data science, the technologies and implementations of data mining, as well as the modeling of several practical questions in biomedicine.

5. Intended Learning Outcomes (State what the student is expected to be able to do at the end of the course according to a given standard of performance)
   •[1] Obtain a basic understanding of data science as a discipline;
   •[2] Understand high-throughput biomedical data of various types;
   •[3] Visualize, analyze and interpret biomedical data with sound statistical principles;
   •[4] Apply and develop computational methods for biomedical data analytics.
6. Assessment Scheme

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Assessing Course ILOs</th>
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<tbody>
<tr>
<td>(Percentage + assessment tasks)</td>
<td>(Respective course ILOs)</td>
</tr>
<tr>
<td>60% Homework</td>
<td>[1-4]</td>
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<tr>
<td>40% Final Exam</td>
<td>[1-4]</td>
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7. Student Learning Resources - Lecture Notes, Readings

Lecture notes and supplementary reading materials will be made available on canvas.

8. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Teaching Activities</th>
<th>Course ILOs</th>
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</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Tutorial</td>
<td>3, 4</td>
</tr>
</tbody>
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Weekly scheduled activities: 4 hrs

9. Course Schedule

Keyword Syllabus:
- Introduction
- High-throughput biological data
- Differential expression analysis
- Function enrichment analysis
- Correlation analysis
- Biological networks & Network analysis
- RNA-seq analysis
- DNA-seq analysis
- Classification and regression