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| Course Title                           | Introduction to Bioinformatics   |  |
| Registration Code                      | L100160001   |  |
| Number of Credits                      | 2  |  |
| Years of Eligible Graduate Students    | 1-2  |  |
| Semester                               | 1st  |  |
| Period                                 | Wed. 1st   |  |
| Room                                   | C17-302 or B11-118 (Information processing room)   |  |
| Instructors                            | Yoshiyuki Ogata, Takashi Inui, Shigenori Nishimura, Koh Aoki, Daisaku Ohta and Osamu Ishibashi   |  |
| Office hours                           | 12:00 - 13:00, Monday  |  |
| Cotact                                 | <a href="mailto:ogata@plant.osakafu-u.ac.jp">ogata@plant.osakafu-u.ac.jp</a>   |  |
| Goals of the course                    | Bioinformatics is a collective term for large-scale data analysis techniques in the biological field using computers. All of the analysis techniques such as sequence analysis and databases in the genome sequence period and gene expression, intermolecular interaction, polymorphism and biological network in the post sequence period are classified in bioinformatics. This class aims to understand and aquire the skill of biological and information scientific principle and application, to extract useful information from these large amount of information and use it, by using computer. |  |
| Textbooks                              | none   |  |
| Books of reference                     | David W. Mount, Bioinformatics: Sequence and Genome Analysis, 2nd Edition, Medical Science International   |  |
| Allied subject                         | none   |  |
| Homework (Preparing for the classwork) | This is a first period class, and in-class time is inadequate to master the material. Students will be assigned work as necessary to complete outside of the class, and will be required to submit reports on this work, which will be graded by the professors.   |  |
| Course outline                         | Each class will consist of a lecture and exercise on the topic noted in the Class schedule. The structure of the classes will vary according to professors, as will the classroom, so students should refer to the Class schedule before each class. The final report will be explained at the last (15th) class. Please see the section of "Evaluation" on allocation of credit.  |  |
| Class schedule                         | 1st  | History and overview of bioinformatics<br>Faculty: Ogata Room: B11-118 Information processing room                     |
|  | 2nd  | Genomics 1. Genome reconstruction and genome database<br>Faculty: Ogata, Room: B11-118 Information processing room     |
|  | 3rd  | Genomics 2. Sequence alignment and genomics<br>Faculty: Ogata, Room: B11-118 Information processing room               |
|  | 4th  | Genomics 3. Homology analysis<br>Faculty: Ogata, Room: B11-118 Information processing room                             |
|  | 5th  | Genomics 4. Next-generation sequencing<br>Faculty: Ogata, Room: B11-118 Information processing room                    |
|  | 6th  | Transcriptomics 1. Full-length cDNA and transcript variant<br>Faculty: Aoki, Room: Bee-118 Information processing room |
|  | 7th  | Transcriptomics 2. Gene prediction and various RNA analyses<br>Faculty: Ishibashi, Room: C17 3F PC room                |

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| 8th        | Transcriptomics 2. Prediction of secondary RNA structure<br>Faculty: Ishibashi, Room: C17 3F PC room  |
| 9th        | Proteomics 1. Classification and structure prediction of proteins-1<br>Faculty: Nishimura, Room: C17 3F PC room   |
| 10th       | Proteomics 2. Classification and structure prediction of proteins-2<br>Faculty: Nishimura, Room: C17 3F PC room   |
| 11th       | Proteomics 3. Proteomics and mass spectrometry<br>Faculty: Inui, Room: C17 3F PC room   |
| 12th       | Metabolomics 1. Outline of Metabolomics and basic knowledge<br>Faculty: Ohta, Room: C17 3F PC room  |
| 13th       | Metabolomics 2. The examples of recent Metabolomics research<br>Faculty: Ohta, Room: C17 3F PC room   |
| 14th       | Metabolomics 3. Presentation for the assignment given in the last class<br>Faculty: Ohta, Room: C17 3F PC room  |
| 15th       | Bioinformatics and programming, the direction for the final report<br>Faculty: Ogata, Room: B11-118 Information processing room   |
| Evaluation | Students will be graded on the basis of daily reports (class 1–15, 90%) and a final report (10%). The daily reports will also be used to verify attendance, and will be calculated at 6% credit x 15 classes. |
| Remarks    | Ogata lab: <a href="http://www.biosci.osakafu-u.ac.jp/ogata/">http://www.biosci.osakafu-u.ac.jp/ogata/</a>  |