

Proposed Course for incoming Erasmus students¹

Responsible for the course (lecturer) (name, phone number, e-mail address)	Professor Stergios Papadimitriou 0030 2510 462 323 sterg@cs.duth.gr
Title of the Course	Introduction to Bioinformatics
ECTS credits	5
Short contents of the course	<p>Introduction to Bioinformatics algorithmic techniques and computer software tools.</p> <p>Study of Biological Databases, their organization, and the data retrieval process. Example databases as NCBI, EBI, KEGG and PDB will be used for web based data retrieval and for studying their programmatic interface.</p> <p>Another subject of study is the important one of sequence alignment and biological database searching. Dynamic programming based approaches will be introduced. The proper definition of distance metrics between biological sequences will also be elaborated. Next, approximation based heuristic suboptimal searching algorithms, as the BLAST one will be studied.</p> <p>Also, the next generation sequencing technologies and the DNA microarrays will be another important subject of study. The important novel domains of rational drug discovery and personalized medicine based on the individual genome analysis will also be discussed.</p>
Aim of the course and target audience	<ul style="list-style-type: none"> • The course will introduce students to Bioinformatics • Target audience: Undergraduate students of Informatics/ Computer Science OR Education
Teaching Methods duration and Evaluation	<p>Lectures: 26 hours Hands-on exercises: 26 hours</p> <p>Evaluation: 100% Individual AND/OR Group Assignments</p>
Offered Period	Spring semester

Indicative bibliography	<ol style="list-style-type: none">1. Introduction to Bioinformatics, Neil C. Jones and Pavel A. Pevzner, Addison Wesley, 20032. Bioinformatics: An active learning approach, Pavel A. Pevzner, Addison Wesley, 2015, Vol. 1 and 23. Arthur M. Lesk, Introduction to Bioinformatics, Fourth Edition, Oxford, 20144. Bioinformatics and Functional Genomics, third edition, Jonathan Pevzner, WILEY Blackwell, 20155. Paul A. Gagniuc, PhD, Algorithms in Bioinformatics, WILEY, 20216. Hannes Hauswedell, Sequence Analysis and Modern C++, Springer 20227. Basant K. Tiwary, Bioinformatics and Computational Biology, Springer 2022
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¹ Could be easily used and offered for TS movement to our Erasmus partners