Code: 1328 **Computational Biology**
Degree: 2nd cycle - Functional Biology
Curricular Year: 1st **Semester Course: 2nd**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: Marta Guerreiro Duarte Mesquita de Oliveira
Other lecture(s): Maria Leonor Mota Morais Cecílio and Maria Manuela Costa Neves Figueiredo
Web Site: http://www.isa.utl.pt/home/node/3769

1. Contact hours:
Lecture/Praticals 70 **Others** 14 **Total** 84

2. Objectives:

The aim is to link biology and computer science knowledge in order to analyze and model biological data.

3. Programme:

Algorithms design
Evolutionary algorithms
Graphs
DNA sequencing: Fragments assembly
Sequence alignment
The Motif finding problem
Probabilistic Models
Markov Chains
Statistical Inference
Microarrays
Clustering and Biclustering
The Biocondutor software R

4. Bibliography:

Main Bibliography

- An Introduction to Bioinformatics Algorithms, N. C. Jones and P. Pevzner, MIT Press, 2004.
- Computational Genome Analysis. An Introduction, Richard Deonier, S Tavaré, and Michael S. Waterman, Springer Verlag, 2005.
- Statistical Methods in Bioinformatics. An introduction (2001). W. Ewens and G. Grant. Statistics for Biology and Health
- Evolutionary Computation in Bioinformatics, Fogel, G.; Corne, D.W. (Eds), Morgan Kaufmann Publishers, Elsevier Science, 2003.

Other Bibliography

- Bioinformaics and Computational Bology Solutions using R and Biocondutor,Gentleman, R.; Carey, V.; Huber, W.; Irizarry, R.; Dudoit, S. (Eds), Springer 2005.

5. Assessment:

- 2 midterm exams and 3 homeworks
Or
- 1 final exam.

6. Estimated Workload: 168 Hours

7. Last Update: 14/7/2010