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Institutions and Foundations participating in the ITMB Program:



NKUA
Dept. of Informatics
& Telecommunications



TEI ATHENS
Dept. of Medical
Instruments Technology



ACADEMY OF ATHENS
Biomedical Research
Foundation



NCSR DEMOKRITOS
Institute of Informatics
& Telecommunications

INFORMATION TECHNOLOGIES IN MEDICINE AND BIOLOGY

Short Study Guide
of the Postgraduate Program

2010 - 2011



The rapid advances in the fields of Biomedical Imaging, Medical Informatics and Bioinformatics, as well as their expanding use in Health Sciences (medicine, biology, biotechnology) create new challenges but also exciting new career opportunities for young, dynamic university graduates of different fields (computer scientists, engineers, biologists, medical doctors etc) who are willing to deepen their understanding by combining knowledge sources and specialize in these important and fast developing fields that heavily depend on the advanced use of Information Technologies.

The Postgraduate Program "Information Technologies in Medicine and Biology" (I.T.M.B.) is by its very nature intensely interdisciplinary. Its objective is to strengthen the knowledge and skills of its postgraduate students in the application of informatics, applied mathematics, and statistical analysis methods in Health Sciences and Biotechnology. The program focuses on subjects related to the organization, management, processing and analysis of biomedical signals and data, as well as on the development of models, algorithms, analysis methods and software tools for bioinformatics, computational biology and systems biology.

The I.T.M.B. Postgraduate Program is organized by the Department of Informatics and Telecommunications of the National and Kapodistrian University of Athens (UoA), in cooperation with the Technological Educational Institute (TEI) of Athens, and in collaboration with the Foundation for Biomedical Research of the Academy of Athens (BRFAA) and the Institute of Informatics and Telecommunications of the National Centre for Scientific Research "Demokritos".

The courses are taught by Professors and Researchers of the above institutions with established experience in the Program's fields of study, and by scientists-specialists of other institutions in Greece and abroad.

The Postgraduate Program I.T.M.B awards two degrees:

1. Master of Science (M.Sc) in:

- > Medical Informatics
- > Bioinformatics

2. Doctor of Philosophy (Ph.D)



.... Duration of studies

The duration of the studies leading to the Master's degree is at the minimum three (3) and at the maximum five (5) academic semesters.

For the Ph.D. degree at least six (6) semesters are required beyond the M.Sc degree.

.... Eligibility criteria

>> The program admits University graduates in the fields of Computer Science, Electrical and Computer Engineering, Informatics and Telecommunications, Medicine, Physics, Biology, as well as graduates of Technological Educational Institutes in related disciplines (Law. 2916/2001 Government's Gazette issue 114A').

>> Holders of the ITMB Masters degree, or of Masters degrees in a similar discipline awarded by a domestic or an accredited Higher Education Institution abroad, are eligible to apply to the PhD program.

.... Student fees

In order to meet the program's needs in infrastructure and human resources, students have to pay a tuition, in accordance with Article 12, §7, Law 2083/1992, and with the provisions stated in the approval document of the ITMB graduate program published in the Greek Gov. Gazette. The fee is currently 800 € per semester and the total financial obligation per student should not exceed an amount equivalent to payments for three semesters.

.... Scholarship and Honors Distinction

A Scholarship will be awarded to one student per track of study. This student has to successfully complete all the course requirements of the first and second semester by the end of the September examination period and before the beginning of the third semester and his/her grade point average has to be the highest among his/her classmates following the same direction of study. Furthermore, this grade point average has to be 8.50 or higher (out of 10). The scholarship award also carries an exemption from tuition fees for the third semester of study.

An Honors Distinction will be awarded to the first student of each direction of study who completes the Master's Program within five semesters and with a grade point average of 8.50 or higher.

The Master's Program may provide qualified students with **financial assistance for conference participation** under certain conditions (read details at ITMB's web page).

.... Courses per semester

Each student must attend and pass eleven (11) courses (9 required and 2 elective) and complete a Master's thesis of research or applied nature, the preparation of which starts during the 2nd semester, but the main part of the thesis work and its writing is performed in the 3rd.

| Code | Course Title | Sem. |
|-------|---|------|
| ΥΠ 1 | Biology - Physiology | 1st |
| ΥΠ 2 | Pattern Recognition | 1st |
| ΥΠ Ι3 | Medical Imaging Systems | 1st |
| ΥΠ Ι4 | Advanced Topics in Signal Processing | 1st |
| ΥΠ Ι5 | Statistical Signal Processing | 1st |
| ΥΠ Β3 | Algorithms in Molecular Biology | 1st |
| ΥΠ Β4 | Introduction to Biotechnology | 1st |
| ΥΠ Β5 | Introduction to Bioinformatics | 1st |
| ΥΠ Ι6 | Acquisition and Processing of Biomedical Data | 2nd |
| ΥΠ 7 | Image Processing and Analysis | 2nd |
| ΥΠ Ι8 | Medical Information Technology and Telemedicine | 2nd |
| ΥΠ Ι9 | Radiographic Anatomy | 2nd |
| ΥΠ Β6 | Biomedical Databases | 2nd |
| ΥΠ Β8 | Algorithms in Structural Bioinformatics | 2nd |

| Code | Course Title | Sem. |
|--------|--|---------|
| ΥΠ Β9 | Machine Learning Methods in Computational Biology | 2nd |
| ΥΠ 10 | Master's Thesis | 2nd-3rd |
| ΕΠ 1 | Embedded Systems | 3rd |
| ΕΠ 2 | Real Time Systems | 3rd |
| ΕΠ 3 | Biomedical Data Mining and Knowledge Discovery | 3rd |
| ΕΠ 4 | Biostatistics | 3rd |
| ΕΠ 5 | Simulation Methods in Medicine and Biology | 3rd |
| ΕΠ 6 | Methods and Applications in Neurosciences | 3rd |
| ΕΠ Ι7 | Intelligent Medical Systems | 3rd |
| ΕΠ Ι8 | Special Topics in Network Design | 3rd |
| ΕΠ Ι10 | Contemporary Hospital and Health-Care Services: Organization and Operation | 3rd |
| ΕΠ 11 | Special Topics on Informatics and Biomedical Applications | 3rd |
| ΕΠ Β7 | Advanced Biotechnology | 3rd |
| ΕΠ Β9 | Special Topics on Bioinformatics | 3rd |

The code of each course indicates the category, the relevant direction and the ascending order, ie:
ΥΠ=Required, ΕΠ=Elective, Ι=Medical Informatics track Β=Bioinformatics track