

POSTGRADUATE PROGRAM

INFORMATION TECHNOLOGIES IN MEDICINE AND BIOLOGY





The Graduate Program ITMB:

"Information Technologies in Medicine and Biology"

- ☐ The most recently established graduate program among those administered by our Dept. (5 years)
- Multidisciplinary graduate program
- Offers two Master Degrees:
 - Medical Informatics (1st track)
 - Bioinformatics (2nd track)

Participating Institutions:

- ➤ <u>Dept. of Medical Instruments Technology of the Technological</u> <u>Educational Institute (T.E.I.) of Athens</u>
- > Biomedical Research Foundation of the Academy of Athens (BRFAA)
- > NCSR "Democritos", Inst. of Informatics and Telecommunications





Why was ITMB created?

The development of **Biomedical Imaging**, **Medical Informatics** and **Bioinformatics**, along with the rapid spread of their use in life and health sciences (medicine, biology, biotechnology) creates

- new challenges, but also
- great opportunities for dynamic scientists of diverse disciplines (computer scientists, engineers, biologists, medical doctors etc.),

who wish to specialize in these **rapidly expanding multidisciplinary fields** that depend more and more on knowledge and familiarity with **information technologies**.

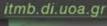


The ITMB program objectives

- ☐ The **specialization** of University graduates in applying modern information technologies in medicine and biology
 - → Reinforce and extend knowledge and skills of graduate students in areas such as:
- Information technology in healthcare
 - medical imaging technologies, telemedicine, medical records management
- Organization, management and analysis of biomedical information
 - biomedical data bases, biomedical signal processing and image analysis, data mining
- Development of algorithms, models and software tools for bioinformatics and systems biology
 - Sequencing, genomics, proteomics, biomarkers discovery, biological networks, drug design

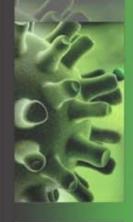






The Master's Program

- Duration of studies = 3 semesters
- Number of Courses = 11
 - Core courses = 9
 - > 1° semester: 5 courses
 - > 2° semester: 4 courses
 - Elective courses = 2 (3° semester)
- Master's thesis (2nd and 3rd semester)
- □ Total ECTS units = 90
 - Courses = 11*6 = 66 ECTS
 - Thesis = 24 ECTS







Medical Informatics track: Core Courses &

1º semester

- Biology Physiology
- Pattern Recognition
- Medical Imaging Systems
- Statistical Signal Processing
- Adaptive Signal Processing

2º semester

- Image Processing and Analysis
- Acquisition and Processing of Biomedical Data
- Medical Information
 Technology and
 Telemedicine
- Radiographic Anatomy







Bioinformatics track: Core Courses &

1º semester

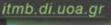
- Biology Physiology
- Pattern Recognition
- Algorithms in Molecular Biology
- Introduction to Biotechnology
- Introduction to **Bioinformatics**

20 semester

- Image Processing and **Analysis**
- **Biomedical Data Bases**
- Algorithms in Structural **Proteomics**
- Machine Learning Methods in **Computational Biology**









- Biostatistics
- Biomedical Data Mining and Knowledge Discovery
- Simulation Methods in Medicine and Biology
- Intelligent Medical Systems
- Contemporary Hospital and Health Care services:
 Organization, Operation, Bioethics
- Methods and applications of Informatics in Neurosciences
- Real Time Systems
- Embedded Systems
- Special Topics on Informatics and Biomedical Applications
- Special Topics in Biotechnology
- Special Topics in Bioinformatics





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Instructors &

- ☐ In the **ITMB** program participate:
 - 10 faculty members of DiT-UoA
 - 8 researchers of BFRAA
 - 5 faculty members of DMIT-TEI-Athens
 - 2 researchers of NCSR-Democritos-IIT
 - 5 researchers and specialists from other institutions
- All instructors are experienced and recognized experts in their field of specialty
- All courses are evaluated by the students every year



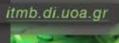
Students Selection &



- **High admission standards**
 - Applications: ~70/year, Accepted: 15-25/year
- Most applicants have background in computer science or engineering
- **Selection Criteria:**
 - Performance in undergraduate studies
 - Relevant Background and experience







Student body - Support

- Active students = **50**
- MSc thesis in progress = **25**
- **Alumni = 25**
 - Completed thesis summaries



- Most students are coming from Greek Universities
 - Foreign students = 2
- Scholarships Distinctions
 - > The top-scored entering student with excellent undergraduate record
 - \triangleright The first student of each track with GPA > 8.5/10 at the end of the 2nd semester (9 courses) - Scholarship
 - ➤ The best graduating student per track with GPA > 8.5/10 Honors
- The Program offers travel support for students who present papers related to their theses to international conferences.









Resources

- ☐ The only source of income for the program is the student fees
 - **800** € per student per semester
- They cover:
 - Instructor payments
 - (Faculty members are not paid)
 - Secretarial support
 - Student scholarships
 - Student travel to conferences
 - Scientific events Seminars
 - Infrastructure support
 - Consumables etc.



Multidisciplinary Seminar Series 🚜

- We invite recognized speakers with cross disciplinary work
- □ Has become a well established forum of scientific exchange in the Athens area
- All our seminars are televised and broadcasted live as webminars on the internet
- ☐ They are also provided as free video lectures



Identified directions for growth

- Establish active collaboration with similar programs in Europe
- Internationalization improve international visibility and cooperation
- Strengthen research activities
- Establish scholarships for doctoral studies
- Establish postdoctoral fellowships
- ☐ Cooperation and common events with alumni

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See details at:

http://itmb.di.uoa.gr/indexEng.html

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