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:**
- Dept. of Medical Instruments Technology of the Technological Educational Institute (T.E.I.) of Athens
- 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<sup>st</sup> semester: 5 courses
    - 2<sup>nd</sup> semester: 4 courses
  - Elective courses = 2 (3<sup>rd</sup> 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

#### 1ο semester
- Biology - Physiology
- Pattern Recognition
- Algorithms in Molecular Biology
- Introduction to Biotechnology
- Introduction to Bioinformatics

#### 2ο semester
- Image Processing and Analysis
- Biomedical Data Bases
- Algorithms in Structural Proteomics
- Machine Learning Methods in Computational Biology
Elective Courses: 3rd semester

- 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
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
  - 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.

See details at: http://itmb.di.uoa.gr/education/edu_ypopsEng.html
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
Welcome

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

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 Life 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 and administered 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 (FBMFA) 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 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)

Subscribe to the RSS feed for forthcoming important announcements.

Third semester students that meet the criteria to be considered for scholarship are kindly requested to submit a petition to the Administrative Support of the Program (Mrs. Kanavou) by Wednesday 31/12/2011.

For Graduate Students
Forms-Applications:
- Application form (MS)
- Application form (PhD)

Links
- Library of INEAN
- Library of TEI
- Library of NCSR "Demokritos"
- Library of BFMFA

Useful
- Access to the departments (contact, maps, directions)
- Administrative Support of the postgraduate programs:
  Mrs. Kanavou (Office 420) Tel.: (+30) 210-727-5237, Fax: (+30) 210-727-5234, e-mail: bkevoud@uoa.gr
- Download the Program's Brochure 2011-12 in two resolutions (Cdrk.zip file to download) - (zip file 396K) - (zip file 2.9MBh)

For Graduate Students
Forms-Applications:
- Application form (MS)
- Application form (PhD)

Links
- Library of INEAN
- Library of TEI
- Library of NCSR "Demokritos"
- Library of BFMFA

Useful
- Access to the departments (contact, maps, directions)
- Administrative Support of the postgraduate programs:
  Mrs. Kanavou (Office 420) Tel.: (+30) 210-727-5237, Fax: (+30) 210-727-5234, e-mail: bkevoud@uoa.gr
- Download the Program's Brochure 2011-12 in two resolutions (Cdrk.zip file to download) - (zip file 396K) - (zip file 2.9MBh)
Ευχαριστώ πολύ!

See details at:

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

Elias S. Manolakos
Assoc. Professor
Director of ITMB program
eliasm@di.uoa.gr