

UNIVERSITY OF CENTRAL GREECE



DEPARTMENT OF INFORMATICS WITH
APPLICATIONS IN BIOMEDICINE

STUDY GUIDE
2007 – 2008



UNIVERSITY OF CENTRAL GREECE
FACULTY OF APPLIED SCIENCES
DEPARTMENT OF INFORMATICS
WITH APPLICATIONS IN BIOMEDICINE

STUDY GUIDE
ACADEMIC YEAR 2007-2008

LAMIA, GREECE 2007

- The Study Guide is the product of an effort aiming at the incorporation of all the necessary information, intended for both students and teachers. Your remarks and recommendations, which could help the next edition of the Study Guide, should preferably be sent at the following e-mail address: peter@ucg.gr
- The Provisional General Assembly and the Administration Board has the responsibility of the curriculum structure.
- The teaching schedule of the Dept. of Informatics with Applications in Biomedicine was organized by Mr. N.A. Asimakis and Mr. P. Konstantinou, with the collaboration of the President of the Department.
- The diligence of the edition had: Prof. D. Loukopoulos, Vice-President of the Administration Board, Ass. Prof. A. D. Karagouni-Kyrtsou and the teachers Dr. P. Bagos, Dr. H. Maglogiannis, Dr. A. Panopoulou, Dr. M. Pappa, Dr. V. Plagianakos and Dr. M. Vasilakopoulos..
- The Study Guide Cover was created by Dr. E.A. Katsifas and the President of the Department.

CONTENTS

	Page
PREFACE	5
LEGAL FRAME	6
PART 1	7
THE UNIVERSITY OF CENTRAL GREECE	9
Administrative Board	10
Departments	11
Administrative Personnel	11
PART 2	13
THE DEPARTMENT OF INFORMATICS WITH APPLICATIONS IN BIOMEDICINE	15
Aim / Profile	16
Career Prospects	18
Organization & Administration	19
Programmes (of the Special Account for Research Grants)	24
Teaching Personnel	25
Installations & Infrastructure	29
Students Provision	31
Transfer Admissions	33
Admission Exams for Graduates	33
PART 3	35
STUDIES	37
Organization of Studies	37
General Curriculum Structure	39
Graduate Thesis Regulation	41
Graduation Requirements	44
Other Basic Regulations of Studies	46
Curriculum Structure by Semester	48

PART 4	54
OUTLINE OF COURSES	56
1 st Semester	56
2 nd Semester	59
3 rd Semester	62
4 th Semester	64
5 th Semester	67
6 th Semester	71
7 th Semester	74
8 th Semester	77
Free Optional Courses	81
Foreign Language Courses	83
PART 5	84
LIBRARY	86
PART 6	90
USEFUL INFORMATION	92

PREFACE

The Study Guide of the Department of Informatics with Applications in Biomedicine aims in an accurate briefing of the first year students that will enable them to adapt easily to their study environment. It can also be helpful for candidate students who would like to be informed about Studies concerning the Informatics and Biomedicine scientific areas. Finally, this guide intends to communicate the Studies content to other scientists, enabling them to identify and, possibly, exploit points of contact and collaboration.

This guide presents the current situation. Since the beginning of the Department's operation, the Study Guide has been reformed, because the curriculum and the regulations were not sufficiently outlined. Today, we consider that we have overcome most of the initial obstacles and that this Study Guide fulfills its objective. It is also clear that the Study Guide's contents are not unchanging or inactive, since they will be improved, depending on the Department's progress, the scientific evolutions and the evolution of the framework of the Faculty of Informatics Applications of the University of Central Greece, which is our main goal. From this position, I would like to thank all of the members of the Administrative Board, the Secretariat's staff and all of my Colleagues, who helped in collecting all the important details for the proper formation of this Study Guide.

Professor Grigorios Skalkeas
Chairman of the Administrative Board

LEGAL FRAME

The Department of Informatics with Applications in Biomedicine operates in the framework of the “Operational programme for Education and Initial Vocational Training II (O.P.Education)” (ΕΠΕΑΕΚ), named “Tertiary Education Enlargement - University of Central Greece (2004-2006)”, integrated in the Category of projects 2.2.b. “Higher Education Enlargement”, of the Action 2.2.2. “Completion of enlargement and curricula reformation in tertiary education”, with project code MIS 92108. The UCG is the ultimate beneficiary of the project. The Legal Act of the project integration is co-financed by the European Social Fund at 75% and by National Resources at 25%. The managing authority of the project financing is the Ministry of National Education and Religious Affairs (ΣΑΕ 445/3).

Furthermore, the Department of Informatics with Applications in Biomedicine has been integrated into the Measure 5.2 of the “Operational programme for Education and Initial Vocational Training II (O.P.Education)” (ΕΠΕΑΕΚ), named “Equipment for supporting the European Social Fund projects regarding the enlargement of the new Departments of Tertiary Education, Third phase (2004-2006) UCG-European Regional Development Fund” with the code MIS 98671. The Financial Services have been prescribed as the Managing Authorities of this project.

I. THE UNIVERSITY OF CENTRAL GREECE

THE UNIVERSITY OF CENTRAL GREECE



The University of Central Greece was founded in 2003. It is a completely self-administrated institution, under the superintendence of the Greek State, which is exercised by the Minister of National Education and Religions. Its foundation aims at the regional growth and decentralization of the Greek Higher Education, and also at responding to social, cultural and developmental needs of the regional community of Central Greece. The Administrative building of the University of Central Greece is located on 2-4 Papasiopoulou Street, in Lamia.

The University of Central Greece is administered by a nine-member Administrative Board that exercises all the responsibilities of the University administrative bodies.

Administrative Board

PRESIDENT: Grigorios Skalkeas

Member of the Academy of Athens

Professor Emeritus of the National and Kapodistrian University of Athens

VICE-PRESIDENT: Dimitrios Loukopoulos

Professor Emeritus of the National and Kapodistrian University of Athens

MEMBERS:

Michail Bekakos

Professor of the Department of Electrical and Computer Engineering
of the Democritus University of Thrace

Georgios Donatos

Professor, Dean of the School of Legal- Economic & Political Sciences
of the National and Kapodistrian University of Athens

Amalia D. Karagouni-Kyrtso

Associate Professor of the Department of Biology
of the National and Kapodistrian University of Athens

Anastasios Papastavrou

Professor of the Faculty of Forestry and Natural Environment
of the Aristotle University of Thessaloniki

Efthimios Pournarakis

Professor Emeritus of the Athens University of Economics and Business

Athina Zamani

Professor Emeritus of the National and Kapodistrian University of Athens

Spyridon Zervos

General Educational Manager of the National and Kapodistrian University of Athens

The Departments of the University

The University of Central Greece comprises two departments, the Department of Informatics with Applications in Biomedicine, located in Lamia and the Department of Regional Economic Development, located in Levadia.

The Department of Informatics with Applications in Biomedicine is operating since the academic year 2004-2005. It is a leading Department in the scientific field of Applied Sciences, as it comes to cover the existing gap in the area of specialization in applications of Informatics in Medicine, Health and Biology.

The Department of Regional Economic Development started its operation in the academic year 2005-2006. It aims at the appropriate education and vocation training of the students, who wish to study Economics and also to obtain specific knowledge that meets particular needs of the Greek Economy in urban and rural areas.

Administrative Personnel

Name	Services	Telephone
Mitropoulou Marianna	Secretariat of the Administrative Board	(+30) 210-6597111
Konstantinou Petros	Administrative Services (head)	(+30) 22310-66900
Zigouri Dimitra	Administrative Services	(+30) 22310-66700
Bourtzala Ioulia	Administrative Services	(+30) 22310-66700
Karanika Constantina	Financial Services	(+30) 22310-66706
Bousiou Evaggelia	Financial Services	(+30) 22310-66705
Papakostas Athanasios	Financial Services	(+30) 22310-66701
Genitsaropoulos Christos	Special Account for Research Grants	(+30) 22310-66702
Patricou Malamo	Special Account for Research Grants	(+30) 22310-66702
Kokinos Alexandros	Salary Payment Service	(+30) 22310-66700

II. THE DEPARTMENT OF INFORMATICS WITH APPLICATIONS IN BIOMEDICINE

THE DEPARTMENT OF INFORMATICS WITH APPLICATIONS IN BIOMEDICINE

The first Department of the U.C.G, the Department of Informatics with Applications in Biomedicine, started its operation in the academic year 2004-2005, with 71 students. The former Teacher Training College building, after being renovated, currently houses the Secretariat, the teaching rooms, the laboratories, the Sports Hall and the Lecture Theatre, on 2-4 Papasiopoulou street at Lamia.



Aim / Profile

The Department of Informatics with Applications in Biomedicine promotes the basic knowledge of Informatics, which, over the years, has been established as an autonomous scientific area. In addition, through the last semesters, the students will be able to obtain specialization, which will contain the evaluation of the Information systems emphasizing in the fields of the Medical Technology, the Medical Information Systems, the Administrative Services and the research in Bioinformatics.

The impressive development of the Informatics technologies (Computers and Communications) and their access in all the traditional processes of production and also in most aspects of our lives, has led to the maximum increase of specialized personnel in a global level. As a result, the educational structures can not correspond to the needs of the labor market. According to official estimates, the annual needs in specialized staff oscillates from 1.200.000 to 1.700.000 in Europe. Not any reliable clues exist for Greece, but the estimates oscillate between 20.000 to 50.000 places (positions) of work, from which, almost the 20.000 concern in the Third Degree Education graduates. According to the labor market's existing demands for the University and Technological Education Institutes graduates and the prediction that these demands will increase, the market's needs will begin to be covered in 2010. Therefore, it is clear that this new Department has meaning of existence, according to the labor market's needs.

The majority of the Information Technology Departments operating in Greece, in step with the main core courses of Informatics, provide specialized areas courses, such as Telecommunications, Information Systems in Administration, Educational Technology, Automation Systems, Software Planning, e.t.c. Such a differentiation in the specialization provided by the IT Departments is beneficial, because, on one hand, it provides general knowledge to the graduates, which is essential for their future and for the comprehension of the scientific area and, on the other hand, it enables them to acquire further knowledge, according to their personal interests.

In the most developed countries, the sector of Informatics with Applications in Health Services is regarded to be one of the most important areas of Software development in all the well-organized Medical Units and, indicatively, includes the designing and implementation of the Hospital Networks, the progress and management of the Medical Information Systems, the supervision and maintenance of the Medical Imaging Instruments, the personnel's availability in exchanging medical files and e-mails, the automation and electronically supported diagnosis, the Telemedicine, the Bioinformatics and other specializations.

Greece falls short, in this specific sector, from other developed countries and it is predicted that there will be a great need in such proficient scientists, in the framework of the extended improvement to the National Health System's function. The Bioinformatics area is one of the rapidly developing scientific fields. At the moment, it is rather difficult to foretell the needs in highly trained personnel; however, it is estimated that, on 2005, the technologically developed countries definitely required this personnel's services, which were considered to cost the amount of \$5.000.000. Despite the fact that, nowadays, according to the current measurements, Bioinformatics is an independent scientific field, it would be risky to form a Bioinformatics Department in Greece, if we consider (considering) our country's investment level and the relatively unsatisfactory industrial development.

Career Prospects

The Department of Informatics with Applications in Biomedicine is an innovative Department in the scientific area of Informatics, as its mission is to face and solve the insufficient specialization of the Informatics Applications in scientific areas such as Medicine, Health and Biology, assuring satisfying career prospects to the graduates, offering them competitiveness and readiness for the labor market's needs.

The career prospects are possible in the private and also public sector, as well as in the scientific research area. Indicatively, it should be noted that the graduates have the possibilities to work:

- In the Public or Private Sector as Informatics specialists.
- In the Public Sector, as personnel in charge of: a) the Health Information Systems development, b) the Hospital electronic file management system, c) The choice of Medical equipment, d) the monitoring research and Development programmes in ministries.
- In Institutions and Research centers, as associate teaching - research staff in research areas such as gene analysis, the modulation of solid structure patterns e.t.c.
- In the Private Sector as the scientific staff in charge of: telemedicine, computer applications in biosignal processing or image analysis, design and research in departments of large enterprises for the design and upgrade of new medical apparatus of artificial organs.

Organization & Administration

THE ADMINISTRATIVE BOARD

The Administrative Board supervises the administration, organization and, in general, the overall function of the University of Central Greece and, in consequence, of the Department of Informatics with Applications in Biomedicine. The Board was constituted and established by virtue of the Presidential Decree 92/03. It is composed of nine (9) members and practices all of the proper activities of the bodies of Administration, including all of the activities of the Special Account for Research Grants administrative services

THE PROVISIONAL GENERAL ASSEMBLY

The Provisional General Assembly (PGA) is responsible for matters concerning the organization and function of the Department and seeks for solutions; it also provides these solutions to the Administrative Board's Members and awaits for their approval.

The PGA is constituted of nine (9) active Academic Scientific Staff's Members, whose research activities and Subject Fields are relevant to the courses offered by the Department, and two representatives of the Students' Union.

CONSTITUTION OF THE PROVISIONAL GENERAL ASSEMBLY

HEAD

Amalia D. Karagouni-Kyrtso

Associate Professor of the Faculty of Biology
of the National and Kapodistrian University of Athens

MEMBERS

Michail Bekakos

Professor of the Department of Electrical and Computer Engineering
of the Democritus University of Thrace

Stavros Hamodrakas

Professor of the Faculty of Biology
of the National and Kapodistrian University of Athens

Christodoulos Kokkinos

Associate Professor of the Division of Mathematics of the School of Applied Mathematics
and Physics of the National Technical University of Athens

Dimitrios Lioupis

Associate Professor of the Dept. of Computer Engineering and Informatics
of the University of Patras

Ioannis Mantas

Professor of the Faculty of Nursing
of the National and Kapodistrian University of Athens

Periklis Mitkas

Professor of the Dept. of Electrical and Computer Engineering
of the Aristotle University of Thessaloniki

Konstantina Nikita

Professor of the School of Electrical and Computer Engineering
of the National Technical University of Athens

Anastasios Papastavrou

Professor of the Faculty of Forestry and Natural Environment
of the Aristotle University of Thessaloniki

Panagiotis Tsanakas

Professor of the School of Electrical and Computer Engineering
of the National Technical University of Athens

Ioannis Vlahavas

Professor of the Dept. of Informatics
of the Aristotle University of Thessaloniki

THE SECRETARIAT

The Departmental Secretariat is responsible for the secretarial assistance of the Chairman and the administrative and secretarial support in the Administrative Board's works; the Secretariat also gathers, processes and draws up the agenda, authenticates the minutes of the General Assembly and hands them in to the Departmental corresponding Services to materialize them and edit the equivalent transcripts or parts of these minutes.



The competences of the Secretariat also include:

- The organization of the students' matriculation in each semester and the issue of their passes for reduced public transportation fares for local and inter-city commutes.
- The publication, on request, of certificates of registration, examination marks, and any kind of certifications.
- The publication and listing of the students' marks.
- The publication of the Academic Calendar and the set of the examining periods.
- The keeping of the students' registration documents.
- The gathering, processing and distribution of the statistic data of the studies.

- The issue and award of the degrees.

Students should note that there are specific deadlines for the issue of certificates and other documents by the Secretariat.

ADMINISTRATIVE PERSONNEL OF THE DEPARTMENT

Name	Services	Telephone
Konstantinou Petros	Secretariat (head)	(+30) 22310-66900
Bilali Despina	Secretariat	(+30) 22310-66901
Panopoulou Afroditi	Secretariat	(+30) 22310-66908
Rafailidou Eleni	Secretariat	(+30) 22310-66708
Spathoulas Georgios	Network Operations Center	(+30) 22310-66926
Venou Paraskeui	Network Operations Center	(+30) 22310-66925
Betsis Dimitrios	Library	(+30) 22310-66929

Programmes

(Special Account for Research Grants)

The Department of Informatics with Applications in Biomedicine operates in the framework of the “Operational programme for Education and Initial Vocational Training II (O.P.Education)” (ΕΠΕΑΕΚ), named “Tertiary Education Enlargement -University of Central Greece (2004-2006)”, integrated in the Category of projects 2.2.b. “Higher Education Enlargement”, of the Action 2.2.2. “Completion of enlargement and curricula reformation in tertiary education”, with project code MIS 92108. The UCG is the ultimate beneficiary of the project. The Legal Act of the project integration is co- financed by the European Social Fund at 75% and by National Resources at 25%. The managing authority of the project financing is the Ministry of National Education and Religious Affairs (ΣΑΕ 445/3).

Furthermore, the Department of Informatics with Applications in Biomedicine has been integrated into the Measure 5.2 of the “Operational programme for Education and Initial Vocational Training II (O.P.Education)” (ΕΠΕΑΕΚ), named “Equipment for supporting the European Social Fund projects regarding the enlargement of the new Departments of Tertiary Education, Third Phase (2004-2006) UCG-European Regional Development Fund” with the code MIS 98671. The Financial Services have been prescribed as the Managing Authorities of this project.



Teaching Personnel

The Department of Informatics with Applications in Biomedicine has employed the acclaimed subject experts mentioned below, as associate teaching staff, according to art. 5 PD 407/80, in order to cover teaching, research and scientific needs.

ACADEMIC YEAR 2005-2006

Name	Wage Rank	e-mail
Christodoulos Kokkinos	Professor	chkokki@math.ntua.gr
Emmanouel Anagnostakis	Associate Professor	emmanagn@otenet.gr
Konstantinos Efstaíou	Associate Professor	cesfta@teiath.gr
Maria Adam	Assistant Professor	maria@math.ntua.gr
Theodoros Andronikos	Assistant Professor	tedandro@cslab.ntua.gr
Nikolaos Asimakis	Assistant Professor	assimakis@teilam.gr
Theodoros Ganetsos	Assistant Professor	ganetsos@teilam.gr
Georgia Gouga	Assistant Professor	zetagouga@tellas.gr
Konstantinos Delibasis	Assistant Professor	kdelibasis@yahoo.com
Panagoula Kollia	Assistant Professor	kollia@med.uth.gr
Stamatia Kotretsou	Assistant Professor	skotretsou@sch.gr
Eleni-Aikaterini Leligou	Assistant Professor	nelly@telecom.ntua.gr
Athanasios Loukopoulos	Assistant Professor	luke@teilam.gr
Evangelos Mallios	Assistant Professor	vagelismallios@yahoo.gr
Panteleimon Bagos	Assistant Professor	pbagos@biol.uoa.gr
Sotirios Bersimis	Assistant Professor	sbersim@unipi.gr
Stavros Degiannakis	Assistant Professor	sdegia@aueb.gr
Vasilios Playianakos	Assistant Professor	vpp@math.upatras.gr
Georgios Rammos	Assistant Professor	Rage48@hotmail.gr
Margaritis Samaras	Assistant Professor	didaktiki@in.gr
Ioannis Stavrakas	Assistant Professor	ys@dlab.ntua.gr
Gergios Furlas	Assistant Professor	gfurlas@teilam.gr
Alexandros Vavoulas	Lecturer	vavoulas@di.uoa.gr
Nikolaos Vaiopoulos	Lecturer	nvaio@di.uoa.gr

ACADEMIC YEAR 2006-2007

Name	Wage Rank	e-mail
Christodoulos Kokkinos	Professor	chkokki@math.ntua.gr
Ioannis Mantas	Professor	jmantas@cc.uoa.gr
Georgios Haramis	Professor	haramis@otenet.gr
Emmanuel Anagnostakis	Associate Professor	emmanagn@otenet.gr
Konstantinos Efstaflou	Associate Professor	cesfta@teiath.gr
Maria Adam	Assistant Professor	maria@math.ntua.gr
Nikolaos Asimakis	Assistant Professor	assimakis@teilam.gr
Iraklis Varlamis	Assistant Professor	varlamis@aueb.gr
Ioannis Vlachogiannis	Assistant Professor	vlachogiannis@gmail.com
Theodoros Ganetsos	Assistant Professor	ganetsos@teilam.gr
Georgia Gouga	Assistant Professor	zetagouga@tellas.gr
Konstantinos Delibasis	Assistant Professor	kdelibasis@yahoo.com
Haralambos Evangelaras	Assistant Professor	hevangelaras@math.ntua.gr
Athanasios Kakarountas	Assistant Professor	kakarountas@ieee.org
Grigoris Karayioryos	Assistant Professor	greg@di.uoa.gr
Eirini Karybali	Assistant Professor	karybali@ceid.upatras.gr
Stamatia Kotretsou	Assistant Professor	skotretsou@sch.gr
Athanasios Loukopoulos	Assistant Professor	luke@teilam.gr
Evangelos Mallios	Assistant Professor	vagelismallios@yahoo.gr
Panteleimon Bagos	Assistant Professor	pbagos@biol.uoa.gr
Sotirios Bersimis	Assistant Professor	sbersim@unipi.gr
Antonios Panagakis	Assistant Professor	apan@di.uoa.gr
Evgenia Papageorgiou	Assistant Professor	epap@math.ntua.gr
Elpiniki Papageorgiou	Assistant Professor	epapageo@ece.upatras.gr
Vasilios Playianakos	Assistant Professor	vpp@math.upatras.gr
Margaritis Samaras	Assistant Professor	didaktiki@in.gr
Harilaos Sandalidis	Assistant Professor	sandalidis@hotmail.com
Theodoros Tsiftsis	Assistant Professor	phtsif@auth.gr
Vasileios Tsounias	Assistant Professor	elsoma@hol.gr
Spiros Fountoukis	Assistant Professor	sfount@phs.uoa.gr
Gergios Fourlas	Assistant Professor	gfourlas@teilam.gr
Alexandros Vavoulas	Lecturer	vavoulas@di.uoa.gr
Nikolaos Vaiopoulos	Lecturer	nvaio@di.uoa.gr
Marina Pappa	Lecturer	marina_pappa@hotmail.com

FALL SEMESTER OF ACADEMIC YEAR 2007-2008

Name	Wage Rank	e-mail
Christodoulos Kokkinos	Professor	chkokki@math.ntua.gr
Emmanuel Anagnostakis	Associate Professor	emmanagn@otenet.gr
Michail Vassilakopoulos	Associate Professor	vasilako@it.teithe.gr
Theodoros Ganetsos	Associate Professor	ganetsos@teilam.gr
Maria Adam	Assistant Professor	maria@math.ntua..gr
Nikolaos Asimakis	Assistant Professor	assimakis@teilam.gr
Irini Vassilaki	Assistant Professor	ivassilaki@vassilaki.net
Spiretta Golemati	Assistant Professor	sgolemati@biosim.ntua.gr
Georgia Gouga	Assistant Professor	zetagouga@tellas.gr
Konstantinos Delibasis	Assistant Professor	kdelibasis@yahoo.com
Haralambos Evangelaras	Assistant Professor	hevangelaras@math.ntua.gr
Athanasios Kakarountas	Assistant Professor	kakarountas@ieee.org
Grigoris Karayioryos	Assistant Professor	greg@di.uoa.gr
Stamatia Kotretsou	Assistant Professor	skotretsou@sch.gr
Athanasios Loukopoulos	Assistant Professor	luke@teilam.gr
Panteleimon Bagos	Assistant Professor	pbagos@biol.uoa.gr
Elpiniki Papageorgiou	Assistant Professor	epapageo@ece.upatras.gr
Georgios Papanagnou	Assistant Professor	allias8@yahoo.gr
Vasilios Playianakos	Assistant Professor	vpp@math.upatras.gr
Evangelos Sakopoulos	Assistant Professor	sakkopul@ceid.upatras.gr
Harilaos Sandalidis	Assistant Professor	sandalidis@hotmail.com
Theodoros Tsiftsis	Assistant Professor	thtsif@auth.gr
Vasileios Tsounias	Assistant Professor	elsoma@hol.gr
Spiros Fountoukis	Assistant Professor	sfount@phs.uoa.gr
Gergios Fourlas	Assistant Professor	gfourlas@teilam.gr
Nikolaos Vaiopoulos	Lecturer	nvaio@di.uoa.gr
Klimis Voyiatzoglou	Lecturer	vogiatzoglou@snu.ac.kr
Crysanthi Golia	Lecturer	s.gkolia@gmail.com
Anastasios Ioannidis	Lecturer	tasobi@med.uoa.gr
Aggeliki Kanaki	Lecturer	kanaki@inp.demokritos.gr
Stavroula-Georgia Mougiakakou	Lecturer	smougia@cc.ece.ntua.gr
Athanasios Barbounis	Lecturer	abarboun@yahoo.com
Marina Pappa	Lecturer	epapageo@ece.upatras.gr
Olga Siskou	Lecturer	olsiskou@nurs.uoa.gr
Miltiadis Chalikias	Lecturer	mchalikias@hotmail.com

In the Department, the following scientists have been elected in positions of Teaching and Research Staff and are currently in the process of being appointed:

Name	Rank	Subject
Michail Vassilakopoulos	Associate Professor (to be appointed)	Database Systems
Ilias Magklogiannis	Assistant Professor (to be appointed)	Management of Biomedical Data for Telemedicine Applications
Panteleimon Bagos	Assistant Professor (to be appointed)	Biology
Vasilios Playianakos	Assistant Professor (to be appointed)	Artificial Intelligence
Charilaos Sandalidis	Lecturer (to be appointed)	Wide Area Wireless Networks

Installations & Infrastructure



Building

The Departmental teaching rooms, the laboratories, the secretariat, the teaching staff's offices, the Lecture theatre and the Sports Hall are located on 2-4 Papasiopoulou street - the former Teacher Training College building - (Telephone number: +30 22310-66900, Fax: +30 22310-66939, Postal Code: 35100, Lamia).

Lecture Rooms

Modern, functional lecture rooms have been built to serve the educational aims of the Department. There are three rooms, equipped with the latest technology teaching aids, which can cover the teaching needs and accommodate scientific conferences.

Teaching Staff's offices

In the building of the Department of Informatics with Applications in Biomedicine, there are five more teaching staff's offices, in which they can accomplish their teaching needs.

Computing labs

There are Computing laboratories, sufficiently equipped with computer networks, seated in the building of the Department, which can provide advanced services of Telematics and support the educational needs of the students, with the most updated way.

Network Operations Center

In the Dept. of Informatics with Applications in Biomedicine, the Network Operations Center – NOC (<http://noc.ucg.gr/>) has been established in 2005. NOC ensures an uninterrupted and high speed interfacing of the departments' users with the local network, as well as, with the Greek and international voice and data networks.

NOC works for the continuous enhancement and modernization of its infrastructure, the acquisition of new know-how and the fast incorporation of ongoing technology in its infrastructure. The use of new technology in education, research and administration and the modernization of the computerization of the department are among its targets.

Tele-education / Material of Courses

In the Dept. of Informatics with Applications in Biomedicine, e-Class, an Electronic Courses Management System is used, for the provision of Asynchronous Tele-education Services.



Students Provision

Provision of Textbooks

All of the students are provided with textbooks free of charge (books or reference books or teaching notes) for each course. The provision of the textbooks can be done either by the Secretariat or by the teaching staff in the beginning of each semester. According to the dates set, students should enroll for the semester courses and they would be provided with the subject handbooks. In case the students have failed in the examinations of the particular subject, they are not entitled to these textbooks again, unless if the subject textbooks have been replaced by new ones.

Students' Boarding (provision of meals)

Provided they fulfill the necessary preconditions, according to the Presidential Decision 387/1983(Government Gazette 141/1983), the students are provided with meal vouchers free of charge. Meal vouchers are offered to the Students' Restaurant, which is located in the Department's Premises, from the 1st of October of each Academic year to the 30th of June of the following year, except from the Holiday seasons. If, for any reasons, these dates change, there ought to be a related decision made by the Administrative Board.

Students' transportation ticket

Undergraduate and postgraduate students are entitled to passes for reduced public transportation fares, as long as the period of their studies has not exceeded the required years (four years plus two years as provided by PD 327/83). The passes are valid for one Academic year and they provide reduced fares to local and inter-city commutes, such as buses, trains or ships, and also reduced tickets to museums and cultural events, at 25% - 50%. The passes are edited by the Secretariat after the matriculation of each student in the beginning of each Academic year; only one (1) photograph is required.

Healthcare

All of the students are entitled to medical and hospital care for the four year of their study plus two years. In case the students have some other kind of social security and wish to have the healthcare offered by the University, they should renounce this social security and choose the student's healthcare grant by applying a declaration on their honor, duly signed by them according to the Law 1599/86, to ensure that "they do not have some other kind of social security". Additional information about the Healthcare is included to the Healthcare booklet.

Students' Union

All students of the Department have the right to register at the Students' Union, which operates according to the law. The representatives of the Union may participate at the collective bodies of the University, according to the internal administrative instructions

Scholarships

The State Scholarship Foundation awards scholarships and prizes, depending on the student's attainment and the personal and his/her family income.

Mobility Grants

The capability to carry out part of their studies abroad (between 3 and 12 months), through the "Life Long Learning / ERASMUS" European Program, is provided. A monthly mobility grant, designated from the National Body of the program (the State Scholarship Foundation), is provided.

Transfer Admissions

According to the provisions of the Article 1 of the Law Number 3282/2004, the transfer admissions of the Greek University students are possible:

A. Without a quantitative restriction, to:

- members of large families / offspring of large families
- offspring of victims of terrorism
- orphaned of both parents
- athletes who have risen to prominence
- people who suffer from serious illnesses

B. With a quantitative restriction:

- for economic and health reasons

Admission Exams for Graduates

The applications and the supporting documents of the Graduates, who wish to be admitted in the Departments of Tertiary Education, are submitted to the Receiving Department from the 1st until 15th of November each Academic year.

The Admission Exams for Graduates are conducted within the period of 1st to 20th of December of each academic year. The Provisional General Assembly has set this kind of examinations. As courses examined for the Admission Exams' Candidates the following ones have been fixed:

1. Mathematical Analysis I (Advanced Calculus I)
2. Physics
3. Introduction to Programming

III. STUDIES

STUDIES

Organization of studies

The Academic year begins on the 1st of September and ends on the 31st of August. Each academic year is divided into two academic semesters, the Winter and the Spring one. The exact dates are set by the Administrative Board (October to mid-January and mid-February to the end of May respectively).

The exam periods are three (3) in total: the Winter examination period or January exam period, the Spring examination period or June exam period and the Re-sit examination period or September exam period. The studies at the Department are of four year duration, articulated in eight (8) semesters. Students' educational needs are covered through lectures, tutorials, course workshops, seminars and course projects given to them, in order to practice in research work.

Academic Calendar

September 1 st	Start of the Academic Year
1 st fortnight of September	Repeating Exams of last year
1 st fortnight of October	Fall Semester start of classes
2 nd fortnight of January	Fall Semester Exams
2 nd fortnight of February	Spring Semester start of classes
1 st fortnight of June	Spring Semester Exams

Holidays / Vacations

October 18 th	St Lucas day, patron saint of Lamia
October 28 th	National Holiday
November 17 th	Remembrance of "Polytechnion" rebellion
December 24 th – January 7 th	Christmas and New Year vacation
January 30 th	The Three Hierarchs day, school holiday
48 th day before Easter (Monday)	Shrove Monday
March 25 th	National Holiday
May 1 st	Labor day
From Holy Monday till Low Sunday	Easter vacations

50th day after Easter (Monday)

Whit Spirit day

August 1st – August 30th

Summer vacations

Course Registration and Attendance

Each student has the possibility to attend and be successfully examined in a specific number of courses at each semester (Fall / Spring) of each Academic year. The number of courses of each semester is “v” for the 1st and 2nd semester, “v+3” for the 3rd, 4th, 5th and 6th semester, where “v” stands for the number of courses in each semester, while there is no restriction for the 7th and 8th semester). The Free Optional courses and the Foreign Language course are not included in the above restriction.

Re-examination in Courses

The (Provisional) General Assembly decided that the students have the right to be re-examined in three (3) courses, for all the academic years, and only once in the same course. The students fill in and submit an application form to the Secretariat, in order to be eligible for examination. The new results are registered into the students’ records, while the former ones cease to be valid.

General Curriculum Structure

Compulsory (Core) courses

The courses, which are considered to be compulsory, are the ones which the students should necessarily attend and pass the following examinations.

The students have only an “academic” obligation to attend the lectures of the theory of these courses; in other words, the attendance of these lectures is not obligatory and there is no attendance list kept with the students’ names, matriculation numbers or signatures; nevertheless, the intensive attendance of the theory lectures is advisable, in order to acquire a personal relation to the teaching staff and obtain a solid background knowledge of the subject. The attendance of the courses workshops is compulsory

The examinations are conducted by members of the academic teaching staff, responsible for each taught subject, in the end of each semester, and they incorporate the material covered in class. The examinations marks are calculated from zero (0) to ten (10); the candidates get the pass, when they have the mark five (5); the examiners must use whole numbers for marking, without the use of fractional units. In case the students fail, they may get a complementary examination. If they fail again, they have to enroll for the particular course again and attend it in a following semester.

Optional courses

The Optional courses, are considered to be the ones from which the students should choose and be examined in a few of them, so as to complete the necessary number of courses, in order to get their degree.

The Optional courses examinations are being under the same provisions, related to the Compulsory courses; in case the students fail, they are able to enroll for the same Optional course or choose a different one.

Free Optional Courses

The Free Optional courses are considered to be the Broad / General Knowledge courses; students should enroll for and be examined in, at least, two (2) of them for the successful completion of their studies and the award of the degree.

The Curriculum includes the titles of Compulsory Core courses and the Optional courses, the subject contents, the weekly teaching hours, in which any kind of instructive work is included, and the sequence or interdependence of the courses offered by the Department. The Curriculum of all the semesters is published each year in the Study Guide

of the Department.

The distribution of the prescribed courses in semesters is indicative and not mandatory for the students; however, it depicts the circumstances of regular studies, incorporated in the minimum number of semesters, required for the award of the Degree of the Department.

Semester	Compulsory Informatics Course	Compulsory Biomedicine Course	Optional	Credits
1	5I	1B		27
2	4I	2B		26
3	4I	2B		25
4	4I	2B		26
5	3I	1B	2 / 5 Op	26
6	2I	2B	2 / 5 Op	24
7	1I	1B	3 / 6 Op	20
8	1I	1B	3 / 8 Op	20
Free Courses			2FC	4
Graduate Thesis (7 th and 8 th sem.)				16
Total	24I	12B	10 Op + 2FC	214

The Curriculum contains the elaboration of the Graduate Thesis during the 7th and 8th semester and seventy-three (73) six-month courses, structured in eight (8) semesters and divided in four categories:

- **Compulsory Core Courses (36)**
24 in Informatics, 12 in Biomedicine
- **Optional courses (25)**
14 in Information Systems
11 in Health Informatics and Bioinformatics
- **Free Optional courses (8)**
6 with credits and 2 without credits
- **Foreign Language Courses (4)**
Compulsory courses, taught in the first four semesters, withouts credits

Graduate Thesis Regulation

The Temporary General Assembly is responsible for the organization of the Graduate Thesis from the beginning until their completion. The President of the Department appoints the members of the Temporary General Assembly responsible for the coordination of the Graduate Thesis. The supervisors - faculty staff and teaching staff - submit titles for the Graduate Thesis to the above mentioned Committee (title, prerequisite courses, number of students, members of the supervisory committee etc) at the beginning of the academic year until the week defined for the election of the semester courses. It is advisable each member of the teaching staff to suggest at least two (2) Graduate Thesis subjects. The maximum number of Graduate Thesis will be defined each time by the Graduate Thesis Coordination Committee of the Temporary General Assembly, in order to guarantee the proper training of the students. The Coordination Committee along with the faculty and teaching staff announces the subjects in an announcement issued by the Secretariat of the Department.

The Graduate Thesis subjects are announced to the students twice during each academic year that is until the 20th of May for the winter semester and the 20th of December for spring semester, so that the students wishing to apply for the respective periods can be duly informed.

Students of the 7th semester who have been successfully examined in 30 courses (core courses, elective and the foreign language courses - the free elective courses are not included) until the submission of their application to the Department's Secretariat, are entitled to elaborate a Graduate Thesis subject.

The Secretariat transfers the applications of the students to the Temporary General Assembly in order to decide which of the students fulfill the requirements in order to elaborate their Graduate Thesis.

The student submits the application to the Department Secretariat at the same time with the semester courses application, that is before or at the beginning of the winter or spring semester respectively.

Each student submits to the Department Secretariat an application using a predefined form. The students are allowed to choose up to six subjects from the ones proposed for their Graduate Thesis. The subjects are presented by the student in the application by order of preference. The application forms are given to the student by the Secretariat.

Students are assigned the subjects by the Committee of the Temporary General Assembly according to a) the grades obtained to the courses defined by the supervisor b) the knowledge of at least one foreign language and c) the interview given by the candidates

to the supervisor who has defined the subjects. The supervisor, after the interview, informs the Committee of the Temporary General Assembly about the students chosen to work on the subject(s). The decision of the Committee of the Temporary General Assembly is handed to the Secretariat. Two students are not allowed to work on the same subject. If this is necessary for specific research reasons, then the students may work together in research but they have to hand each one a separate Graduate Thesis having different titles.

During each academic year there is an adequate number of Graduate Thesis. Since the Graduate Thesis constitutes a substantial part of the education offered by the department, efforts are made to cover the needs in all subjects. In case there is a lack of subjects, the Temporary General Assembly tries to seek solutions for all the 4th academic year students.

The minimum research period for the Graduate Thesis is 2 (two) semesters and the maximum 3 (three) semesters. In case the three semester time is exceeded, the question is relegated to the Temporary General Assembly.

During the elaboration of the Graduate Thesis, the supervisor and the student are in constant communication, so that the supervisor can check and guide the student through the elaboration of the Graduate Thesis. The supervisor is obliged to guarantee the access of the student to the laboratories necessary for the elaboration of the Graduate Thesis. The student is entitled to have access to the equipment necessary for constructions that are part of the Graduate Thesis.

In order to treat all students equally and since the Graduate Thesis is mainly a laboratory research project in order to learn the methodology, the use of literature and the analysis - evaluation of results, there are no theoretical Graduate Thesis given that involve only literature research.

After the conclusion of the Graduate Thesis the student has to submit:

A) the Graduate Thesis text in the form of a book (2 copies, one for the library and one for the Secretariat - apart from the copies given to the Supervisor and the Supervisory Committee in hard and soft copy (CD) including a summary in English. In the cover of the book and in the CD label there will be the following indications:

UNIVERSITY OF CENTRAL GREECE
FACULTY OF APPLIED SCIENCES
DEPARTMENT OF INFORMATICS
WITH APPLICATIONS IN BIOMEDICINE
Title
Student's name

Supervisor
Lamia
Year

B) in the soft copy the following data

Title
Author
Date
Supervisor
Summary
Key words

The Graduate Thesis is handed in by the student to the 3 members of the Supervisory Committee at least 3 (three) weeks before defending the thesis.

The three member examination committee (in which participates the Supervisor and which is formed ad hoc by faculty staff of areas related to the Graduate Thesis subject) is appointed by the Graduate Thesis coordination committee of the Department's Temporary General Assembly and is given at least three weeks to examine the Graduate Thesis.

Each Graduate Thesis is defended in public at the end of each exam session following an announcement of the Supervisor in the Secretariat announcement board, at least one week before defending the Graduate Thesis.

After the Thesis has been defended, the Supervisor grades the Thesis either immediately or within a week and submits the grade to the Secretariat.

Graduation (degree) preconditions

In order to fulfill their obligations successfully and obtain the award of Degree of the Department of Informatics with Applications in Biomedicine, the students should:

- Enroll for, at least, eight semesters; that is, they can not obtain their degree before completing, at least, eight semesters of their studies.
- Be successfully examined in all the Core courses (24 Informatics courses and 12 Biomedicine and Bioinformatics core courses); the rating for these 36 courses amounts to 154 Credits.
- Be successfully examined in 10 Optional courses (of the 25 optional courses offered by the Department); the rating for these courses amounts to 40 Credits.
- Be successfully examined in 2 Free Election courses (of the 8 Free Election courses offered by the Department); the rating for these courses amounts to 4 Credits.
- Fulfill successfully the writing of their Dissertation, which they may start working on it from Semester 7 onwards. (The Dissertation is accounted to 4 six - month taught subjects, with 4 teaching hours per week). The rating of the Dissertation amounts to 16 Credits.
- Be successfully examined in or be exempt from the Foreign Language courses; it should also be noted that for these courses students do not receive any credits.

Degree Grade

The mark for the Award of Degree is calculated by multiplying the marks of each course by the Credit value of the course, and the sum of the individual products is divided by the sum of the Credit values of these courses. The Credit values are determined as follows :

1. Courses with 2 credits: their Credit value is equal to 1.0
2. Courses with 3-4 credits: their Credit value is equal to 1.5
3. Courses with more than 4 credits: their Credit value is equal to 2.0
4. Dissertation: the Credit value is equal to 6.0

The grade of the Degree is calculated by the formula below:

$$\text{Degree Grade} = \frac{\sum_{i=1}^N \sigma_i \cdot B_i}{\sum_{i=1}^N \sigma_i}$$

N is the total of the courses offered for the Award of Degree Compulsory courses, Optional courses, Free Election Courses and the Dissertation

B_i stands for the mark of each course and

σ_i stands for the Credit Value of each course



Other Basic Regulations of Studies

Since March the 20th 2007, the Law 3549/2007 has prevailed (Reform of the single institutional framework, for the structure and operation of Higher Education Institutes, Government Gazette 69, volume A./2007), which in Article 14 fixes the maximum duration of studies:

1. a) From the next academic year from the coming into application of the present law, the maximum duration of undergraduate studies cannot exceed the minimal number of semesters that is required for the reception of degree, according to the curriculum of the respective department, overloaded at 100%. In exceptional cases is possible with a decision of the University Senate, after a justified proposal of the General Assembly of the Department and relative application of the student, the extension of the maximum duration of applicant's studies, up to two (2) semesters.

b) The students have the right, with a written application in the Department's Secretariat, to interrupt their studies for a number of semesters, continuous or not, and in any case no more than the minimal number of semester periods that is required for the reception of degree, according to the indicative program of the Department. This period is not counted in the above - mentioned maximum duration of studies. The students that interrupt as above their studies do not have any of the students' rights at the all time interval of interruption of their studies. After the expiration of the interruption of studies the students return at the Department.

c) After the expiration of the maximum duration of studies, the students' rights are automatically declared to be void. When these rights cease to be valid, the Secretariat of the familiar Department issues a notice, with which the courses in which the student has been successfully examined are also certified.

d) Students that, at the coming into application of the present law, are registered in University Departments and have still not exceeded the minimal number of semesters that is required for the reception of degree according to indicative program of the Department, may continue their studies up to the completion of this minimal number of semesters and beyond this on five (5) additional academic years. Students that, at the coming into application of present law, have already exceeded the minimal number of semesters that is required for the reception of degree may continue their studies on five additional academic years, starting from the next academic year from the coming into application of the present law.

e) Students that, at the coming into application of the present law, have already exceeded the above-mentioned maximum limit of studies are called by the University to

declare written if they wish to continue their studies. In case of an affirmative statement they can continue their studies for five (5) additional academic years, starting from the next academic year from the coming into application of present law. Otherwise, they are erased from the registrations of the University and their students' rights are declared to be void. For this purpose, a notice is issued by the Secretariat of the respective Department, with which are also certified the courses in which the student has been examined successfully.

2. For the students that will be registered in Universities from the next academic year from the coming into application of the present law, is not allowed the choice and examination of compulsory courses of higher semesters if they have not been examined successfully in compulsory courses of prior semesters, the knowledge of which, according to the decision of the General Assembly of the Department after proposal of familiar Sectors, is essential for the follow - up and successful examination of compulsory courses of higher semesters according to the curriculum of the respective Department.

3. a) After failure in the examination of compulsory courses of the previous paragraph, the students have the right of registration in the same course in the next semester. Provided that they fail in the examinations at the end of each semester, they have the right to fill in an application, which is submitted at least one month prior to the examination, and ask to be re-examined in the examining period of September from a three-member examining committee, in which may be participating as examiners up to two faculty members, of a similar Department of the same or other University.

b) If the student in the examination of a compulsory course of the previous paragraph, fails in front of the three-member committee, he may continue registering itself in this course and in next semester, without being eligible in selecting and being examined in courses of higher semesters that assume a successful examination in this compulsory course.

4. It is allowed issuing of the degree in students that fulfill the conditions of reception of degree and have proportionally supplemented seven or nine or eleven semesters of studies, in case when the minimum number of semesters that is required for the reception of degree is eight or ten or twelve, respectively.

5. The necessary details concerning the enforcement and application of this article are regulated by the Internal Regulation of Universities.

Curriculum Structure by Semester

T= THEORY L= LAB S= SUM C= CREDITS

- The first number denotes the semester
- The first letter denotes the type of the course (C stands for Compulsory/Core courses, O stands for Optional courses)
- The second letter denotes the discipline (I stands for Informatics area, B stands for Biomedicine)
- The other two numbers form the serial number of each course
- FL stands for “Foreign Language”

1st YEAR

1st SEMESTER

TITLE	T	L	S	C
1CI01 Mathematical Analysis I (Advanced Calculus I)	5	0	5	5
1CI02 Linear Algebra	4	0	4	4
1CI03 Introduction to Programming I	3	2	5	5
1CI04 Introduction to Informatics	2	2	4	4
1CI05 Physics	5	0	5	5
1CB06 Biochemistry	4	0	4	4
1FL01 English I	2	0	2	0
SUM	25	4	29	27

2nd SEMESTER

TITLE	T	L	S	C
2CI01 Mathematical Analysis II (Advanced Calculus II)	5	0	5	5
2CI02 Discrete Mathematics	4	0	4	4
2CI03 Object-oriented Programming	3	2	5	5
2CI04 Digital Design	2	2	4	4
2CB05 Biology I	4	0	4	4
2CB06 Introduction to Biomedical Technology	3	1	4	4
2FL01 English II	2	0	2	0
SUM	23	5	28	26

2nd YEAR**3^o SEMESTER**

TITLE	T	L	S	C
3CI01 Numerical Analysis	2	2	4	4
3CI02 Probability and Elementary Statistics	4	0	4	4
3CI03 Electronics Principles	3	2	5	5
3CI04 Computer Architecture	4	0	4	4
3CB05 Biology II	4	0	4	4
3CB06 Anatomy and Physiology I	3	1	4	4
3FL01 English III	2	0	2	0
SUM	22	5	27	25

4^o SEMESTER

TITLE	T	L	S	C
4CI01 Computer Networks	4	0	4	4
4CI02 Data Structures and Algorithms	4	1	5	5
4CI03 Operating Systems	4	1	5	5
4CI04 Signals and Systems	4	0	4	4
4CB05 Anatomy and Physiology II	3	1	4	4
4CB06 Biostatistics	2	2	4	4
4FL01 English IV	2	0	2	0
SUM	23	5	28	26

3rd YEAR5^o SEMESTER

TITLE	T	L	S	C
5CI01 Data Bases	4	2	6	6
5CI02 Introduction to Telecommunications	2	2	4	4
5CI03 Software Engineering	4	0	4	4
5CB04 Bioinformatics I	4	0	4	4
SUM	14	4	18	18
OPTIONAL COURSES (2 out of 5)				
5OI01 Applied Mathematics	4	0	4	8
5OI02 Computer Graphics	4	0	4	
5OI03 Information Theory and Coding	4	0	4	
5OB04 Digital Bio-signal Processing	3	1	4	
5OB05 Genetics of Inherited Diseases – Population Genetics	4	0	4	
SUM	7 or 8	0 or 1	8	8
TOTAL SUM	21 or 22	4 or 5	26	26

6^o SEMESTER

TITLE	T	L	S	C
6CI01 Digital Communications	4	0	4	4
6CI02 System Analysis	2	2	4	4
6CB03 Health Information Systems I	4	0	4	4
6CB04 Technology of Medical Equipment	3	1	4	4
SUM	13	3	16	16
OPTIONAL COURSES (2 out of 6)				
6OI01 Theory of Programming Languages	4	0	4	8
6OI02 Pattern Recognition	4	0	4	
6OI03 Operational Research	4	0	4	
6OI04 Wireless Communication Systems	4	0	4	
6OB05 Bioinformatics II	4	0	4	
6OB06 Telemedicine	4	0	4	
SUM	8	0	8	8
TOTAL SUM	21	3	24	24

4th YEAR7^o SEMESTER

TITLE	T	L	S	C
7CI01 Internet Application Technology	4	0	4	4
7CB02 Healthcare Systems Management and Administration	4	0	4	4
SUM	8	0	8	8
OPTIONAL COURSES (3 out of 6)				
7OI01 Artificial Intelligence	4	0	4	12
7OI02 Graph Theory	4	0	4	
7OI03 Theory of Computation	4	0	4	
7OI04 Human Computer Interaction	4	0	4	
7OB05 Systems of Support of Medical Decisions	4	0	4	
7OB06 Medical Imaging Systems	4	0	4	
SUM	12	0	12	12
GT Graduate Thesis	8	0	8	8
TOTAL SUM	28	0	28	28

8^o SEMESTER

TITLE	T	L	S	C
8CI01 Security of Computer Systems	4	0	4	4
8CB02 Biomedical Image Analysis	3	1	4	4
SUM	7	1	8	8
OPTIONAL COURSES (3 out of 8)				
8OI01 Data Mining & Knowledge Discovery	4	0	4	12
8OI02 Embedded Systems	4	0	4	
8OI03 Inter-connected Systems	4	0	4	
8OB04 Automatic Control Systems and Applications in Biomedicine	4	0	4	
8OB05 Health Information Systems II	4	0	4	
8OB06 Health Economics	4	0	4	
8OB07 Simulation of Biological Systems	3	1	4	
8OB08 Special Topics on Bioinformatics & Bioethics	4	0	4	
SUM	11 or 12	0 or 1	12	12
GT Graduate Thesis	8	0	8	8
TOTAL SUM	26 or 27	1 or 2	28	28

FREE COURSES (OPTIONAL GENERAL KNOWLEDGE)

TITLE	T	S	C	Teaching Semester
0OC01 Introduction to Political Economy	2	2	2	Fall
0OC02 Public Relations	2	2	2	Fall
0OC03 Sociology	2	2	2	Fall
0OC04 Public Law	2	2	2	Spring
0OC05 Business and Innovation	2	2	2	Spring
0OC06 Introduction to European Union Law	2	2	2	Spring
0OC07 Didactics of Informatics *	2	2	-	Spring
0OC08 Educational Science *	2	2	-	Fall

The students should attend at least two (2) courses, out of the eight (8) offered Free Optional Courses.

*The courses entitled “Didactics of Informatics” and “Educational Science” do not receive any Credit; nevertheless, they are mentioned in the graduates’ transcript, with the notation “pass” or “fail”.

The Foreign Language Courses

The Foreign Language Courses are Compulsory. The students are obliged to pass the four (4) English Language courses. These courses are not graded, but they receive the notation “pass” or “fail” in the graduates’ transcript.

Students who hold the Certificates of Proficiency in English, (University of Cambridge, or University of Michigan) are exempt from the Courses ‘English I’ and ‘English II’.

Terminology related to the relevant Informatics, Biomedicine and Bioinformatics courses is taught in the courses “English III” and “English IV”.

IV. OUTLINE OF COURSES

OUTLINE OF COURSES

The syllabus of the compulsory courses, the optional courses and the free optional courses follows.

SYLLABUS OF UNDERGRADUATE COURSES

1st YEAR

1st Semester

1CI01 Mathematical Analysis I (Advanced Calculus I)

Sets. Mappings. Real numbers. Axiomatic foundations of the real numbers. Rational numbers. Intervals. Distance. Neighborhoods. Classification of points of $\mathbb{R}$. Open and closed sets. Sequence of real numbers. Limit of a sequence. Operations with limits. The Cauchy criterion. Monotonic sequences. Contraction sequence. Recurrence sequence. Difference equation. Numerical series. Basic tests for convergence of numerical series. Limit of a function. Operation with limits. Continuity of a function at a point. Operations with continuous functions. The derivative of a function. Basic theorems. Leibniz's rule. Derivative of composite function. Many-valued functions. Inverse functions. Derivative of inverse functions. Inverse trigonometric functions. Hyperbolic functions. Inverse hyperbolic functions. Derivative of implicit functions. Change of variables in differential expressions. Differential of a function. Derivatives and differentials of higher order. Taylor's formula with Peano's form of the remainder. Taylor's formula with Lagrange's form of the remainder. Taylor's series. Power series. Indefinite integral. Basic methods of computing indefinite integral. The Riemann integral. Properties of the definite integral. The fundamental theorem of calculus. Further properties of integrals. Applications of the definite integral. Improper integral. Relationship between improper integrals and series. Basic tests for convergence of improper integrals. Ordinary differential equations. Variable separate. Linear differential equations of first order. Linear differential equations of second order with constant coefficients. Euler-type equations.

1CI02 Linear Algebra

Matrix algebra and basic properties of operations. Inverse matrices. Algorithms of computing of inverse and properties of invertible matrices. Determinants and their properties. Matrices and systems of linear equations. Rank of a matrix. Solving linear

systems-Algorithms Gaus and Cramer. Euclidean spaces $\mathbb{R}^n$. Vector spaces and subspaces. Special vector subspaces (sum, intersection, orthogonal complement). Linear combinations, spanning sets, linear dependence-independence of vectors. Basis and dimension of a vector space. Fundamental theorem for a finite dimension vector space. Inner product on a vector space norm of a vector. Orthogonal spaces and basic theorems. Orthonormalization of a basis-Algorithm Gram-Schmidt. Linear transformation – Matrix of a linear transformation. Similar matrices. Eigenvalues and eigenvectors- Properties-Theorem Cayley- Hamilton Minimal. Polynomial. Diagonalizing of a matrix. Two criteria diagonalizable matrix (linear transformation). Spectral theorem. Applications. Quadratic forms- basic criteria for symmetric matrices. Applications to quadratic forms on the problems min-max

1CI03 Introduction to Programming I

C and C++ Programming languages. Structured program development. C and C++ Keywords. Identifiers. Data types. Program control. Functions. Variables. Variable scope and variable life. Arrays. Pointers. Relations between pointers and arrays. References and memory addresses. Characters. Characters and strings. Formatted input and output. Structures. Accessing members of structures. Unions. Enumerations. Bitwise operations. File accessing. File processing. Preprocessing and compilation of programs. Advanced programming topics. Δομές Data Structures. C++ is an improved C. Data abstraction. Classes. Inheritance. Polymorphism. Operator overloading. Virtual functions. Stream input and output. Templates. Exceptions.

Laboratory:

C and C++ Programming Exercises.

1CI04 Introduction to Informatics

Software and Hardware (Computers and algorithms, programming and programming languages, software-hardware hierarchy, algorithms importance). Algorithms design (Programming and programming languages, syntax and semantics, algorithms design and analysis, sequence, selection, iteration, modularity, recursion, parallelism, data structures). Theory of Algorithms (Computability, complexity, correctness). Computer architecture (Binary logic, components, communication). System software (Language translators, Operating systems). Data bases (Data models, relational model, data base management system). Computer networks (Computer networks utility, packet switching, computer network architectures). Social issues (Employment, privacy, security). Exercises: arithmetic systems.. Change of base. Arithmetic operations. Complements. Signed binary numbers.

Search-Sort-Merge algorithms. Algorithm complexity. Algorithms analysis and design. Algorithm complexity computation. Data base design and implementation. Laboratory: Windows. Word. Excel. Power Point. Matlab.

1CI05 Physics

Newtonian mechanics. Introduction to differential equations of Physics, velocity, acceleration. Universal Law of gravitation. Momentum. Angular momentum. Torque. Potential energy. Work. Power. Newton's Laws. An harmonic oscillator. Electromagnetic field. Bohr's quantum theory. Optics.

1CB06 Biochemistry

Construction, classification and nomenclature of organic compounds. Kinds of chemical bonds and noncovalent bonds. Isomerism: syntactical isomerism, stereoisomerism (optical isomerism, diastereoisomerism). Aromatic compounds.

Introduction to biochemistry (acid - base concepts, buffers). Protein structure and function (amino acids, peptides, proteins). Enzymes (structure, action mechanisms, control of enzymatic activities, inhibitors, coenzymes). Structure and function of nucleic acids (DNA, RNA). Structure and function of carbohydrates (monosaccharides, disaccharides, oligosaccharides, polysaccharides). Structure and function of lipids (fatty acids, triacylglycerols, phospholipids, glycolipids, lipoproteins, steroids). Introduction to biological membranes (structure, receptors). Metabolism of biomolecules (basic concepts and design, ATP). Metabolism of carbohydrates (glycolysis, citric acid cycle, oxidative phosphorylation, pentose phosphate pathway, gluconeogenesis). Fatty acid metabolism (β -oxidation, ketone bodies, biosynthesis of cholesterol). Protein metabolism (decarboxylation, transamination, urea cycle). Hormones (structure, action mechanisms, function).

2nd Semester**2CI01 Mathematical Analysis II (Advanced Calculus II)**

Euclidean space R^n . Neighborhoods. Classification of points of R^n open and closed sets. Sequences. Basic theorems. Functions of several variables. Limit of a function. Operations with limits. Continuous function. Properties of continuous functions. Partial derivatives. Partial derivatives of higher order. Differentiable function. Total differentials. Differentials of higher orders. Differentiation of composite functions. Implicit functions. Jacobians. Transformations. Inverse transformations. Directional derivatives. The mean-valued theorem and Taylor's theorem for several functions. Extreme values. Extreme values under constraints. Double and triple integrals. Scalar and vector fields. Gradient, divergence and curl. Line integral of first kind and second kind. Green's formula. Surface integral of the first and second kind. Stokes' theorem. Gauss' theorem. Conservative field. Solenoidal field.

2CI02 Discrete Mathematics

Introduction. Logic. Propositional equivalences. Predicates and quantifiers. Introduction to set theory. Set operations. Finite and infinite sets. Relations and functions. Equivalence relations and partial ordering. Counting. Pigeonhole principle. Permutations and combinations. Languages and grammar. Finite-state machines. Language recognition. Introduction to graph theory. Planar, weighted and directed graphs. Euler paths and cycles, Hamilton paths and cycles, the travelling salesman problem. Introduction to Trees. Spanning and binary trees. Other tree and graph algorithms. Introduction to computational complexity. Properties of integer numbers, prime numbers, mathematical induction and recursion. Applications to real world problems.

2CI03 Object-oriented Programming

Java programming language. Java virtual machine. The basic structure of a Java program. Classes and objects. Constructors. Java keywords and data types. Flow control of a Java program. Methods. Arrays. Class design. Abstraction and object oriented design. Unified modeling language. Advanced class features. Inheritance. Abstract classes. Interfaces. Implementation of abstract classes and interfaces. Polymorphism. Encapsulation. Exceptions and exception handling. Files and streams. Graphical user interfaces. Events and event handling. Threads and multithreading programming. Advanced input and output streams. TCP/IP based (inter)network programming using sockets. Web technologies and interactive application web servers. Java servlets. Java server pages. Architecture models of interactive web application development. JSP development using custom tags.

Laboratory:

Java programming exercises and (inter)network application development.

2CI04 Digital Design

Number systems and codes. Boolean algebra. Switching algebra. Logic gates. Logic functions. Simplification of logic functions. XOR, XNOR logic functions. Analysis and synthesis of combinational circuits. Arithmetic circuits. Adders, Subtractors. Multiplexers - Demultiplexers. Coders - Encoders. Comparators. Latches – Flip - Flops (S-R, J-K, D, T), Registers. Shifters. Counters. Memory circuits, Error detection and correction. Sequential circuits. Algorithmic state machines. Data processing units. Control subcircuits. Introduction to Hardware Description Languages (Verilog, VHDL). Laboratory experiments.

2CB05 Biology I

Origin and evolution of living organisms. Biological molecules. Molecular interactions. Similarity and diversity of cells. Cellular organization. Model organisms. The structure and function of DNA. The structure of eukaryotic chromosomes. Genetic code. DNA replication. DNA repair. DNA recombination. From DNA to RNA. From RNA to proteins. RNA and the origins of life. The shape and structure of proteins. Protein function. Protein classification. How proteins are controlled. Control of gene expression. Regulatory sequences in DNA. Regulatory proteins. Transcription factors. Genetic variation. The bacterial and eukaryotic genome. Manipulating genes and cells. How DNA molecules are analyzed. Nucleic acid hybridization. DNA cloning. DNA engineering. Membrane structure. The lipid bilayer. Membrane proteins. Membrane transport. Carrier.

2CB06 Introduction to Biomedical Technology

Introduction to medical informatics: Electronic medical record (definition and applications), Hospital information systems (main subsystems - structure and function - architecture for implementation, legal and ethical matters). Encoding of medical image information and nomenclature (ICD, SNOMED) and examples, introduction to HL7 and XML protocol and examples. Introduction to signals, definitions and properties, sampling and analog reconstruction, elementary processing techniques – convolution and correlation. Application to biosignals with reference to ECG acquisition. Introduction to image processing: basic concepts and definitions (pixelation, pixel size, colormaps etc), logical and arithmetic operations to images, contrast enhancement techniques, neighborhood operators (convolution and

introduction to non linear operators). Introduction to image segmentation. Applications to medical images. Introduction to medical image formation and main imaging systems: Elements of X-ray interaction with matter and biological material, introduction to the concepts of object contrast, photon noise, patient dose and spatial resolution and their interconnection for X-ray imaging. Radiographic image formation. Introduction to CT imaging system, parallel projection acquisition and image reconstruction.

2nd YEAR
3rd Semester**3CI01 Numerical Analysis**

Introduction. Roundoff errors and computer arithmetic. Linear systems of equations: Gaussian elimination, LU factorization and Choleski methods. Norms-Stability of linear systems of equations. Jacobi and Gauss–Seidel methods. Eigenvectors and eigenvalues. Method of Least Squares. Interpolation and Fitting: Lagrange and Hermite interpolation. Numerical integration. Lagrange integration formulas. Gauss integration. Nonlinear equations and systems of equations: bisection method, fixed-point iteration, Newton–Raphson method, etc. Boundary value problems for ordinary differential equations: Taylor and Runge-Kutta methods. Single and multi-step methods. Predictor-Corrector methods. Applications to real world problems.

3CI02 Probability and Elementary Statistics

Introduction to combinatorics. Introduction to probability theory. Events and elementary set theory. Conditional probability. Bayes' Rule. Discrete and continuous random variables. The distribution of discrete and continuous random variables. Joint distribution of discrete and continuous random variables. Mean. Variance and moments of a random variable. Continuous distributions. Sampling distributions. Relationships of distributions. Estimators (Moments method, maximum likelihood method, least squares method). Confidence intervals. Hypothesis tests. The analysis of variance. Simple linear regression. Confidence intervals and hypothesis tests for the coefficients of the linear model. Predictions using linear models. Multiple regression.

3CI03 Electronics Principles

Electronic device evolution. Circuit analysis methodology according to Kirchhoff, Thevenin, and Norton. Linear one-port and two-port network. Semiconductor energy-band structure and current density. Characteristic curves, functional equivalent, load lines, small-signal response, and technological applications of semiconductor p-n junction diode, bipolar junction transistor (BJT), and field-effect transistor (FET).

3CI04 Computer Architecture

The structure of a computer system and the functionality of its units. Memory organization, types of memory. Main memory (SRAM, DRAM and addressing), cache memory

(fundamental design elements), Exploitation of memory hierarchy. Data input/output modules – functionality and techniques (probing, interrupts, direct memory access). Structure of the central processing unit. Computer arithmetic (algorithms and standards). Instruction execution. Instruction classes (opcodes and functionality). Synchronization issues. Control unit functionality, microprogramming. Advanced architectures. (RISC, CISC, high speed computing). Pipeline. Parallelism. Out-of-order execution (VLIW and Superscalar). Vector computing. Multi core architectures, efficient scheduling of tasks, threads and use of resources. Multi-processing, multi-threading.

3CB05 Biology II

Energy generation in mitochondria and chloroplasts. Mitochondria and oxidative phosphorylation. Electron transport chains and proton pumping. Chloroplasts and photosynthesis. The origins of chloroplasts and mitochondria. Intracellular compartments and transport. Membrane enclosed Organelles. Protein sorting. Vesicular transport. Secretory pathways. Endocytic pathways. Cell communication. Cell signaling. G protein linked receptors. Enzyme linked receptors. Cytoskeleton. Intermediate filaments. Microtubules. Actin filaments. Muscle contraction. Cell cycle control and cell death. The cell cycle control system. Programmed cell death. Extracellular control of cell numbers and cell size. Cell division. An overview of M Phase. Mitosis. Cytokinesis. Genetics, meiosis, and the molecular basis of heredity. Mendel and the laws of inheritance. Extracellular matrix and connective tissues. Epithelial sheets and cell junctions. Tissue maintenance and renewal. Cancer.

3CB06 Anatomy and Physiology I

Description of the structure and function of human systems: skeletal system, muscular system, digestive system and respiratory system.

4th Semester**4CI01 Computer Networks**

Basic networking concepts. OSI architecture. Internet protocol stack. Physical layer: Data transmission. The notions of spectrum and bandwidth. Encoding and modulation techniques of analog and digital signals. Synchronous and asynchronous transmission. Interfaces. Data link layer: Flow control. Sliding window. Link usage. Error detection. Data link control protocols. HDLC multiplexing protocol: Basic principles and forms, time-, frequency-, wavelength-division multiplexing. Switching techniques: Circuit, packet and virtual circuit switching. Performance evaluation. ATM technology. Cell transmission. Service classes. MPLS and Frame Relay technologies. Congestion control and traffic management for several network types. Local networks (LANs): Ethernet, Token ring. Wide area networks (WANs): SONET. Internet protocols: IP, the functions of routing, segmentation - reassembly and TCP (transport protocol). Flow control and error correction. Internet applications and their implementation protocols.

4CI02 Data Structures and Algorithms

Introduction to data structures algorithms and complexity. Storing and accessing arrays. Linked lists, stacks and queues. Search, insertion and deletion in trees. Balanced trees. Multiway trees. Introduction to graphs and graph traversal. Search methods. Hashing. Sorting. Introduction to design and analysis of algorithms. The brute force method. Divide and conquer. Space-efficiency versus time-efficiency. Dynamic programming. Greedy method. Restrictions in algorithmic design.

4CI03 Operating Systems

Computer systems. Evolution of operating systems. Characteristics of modern operating systems. Process description and control. Threads. Multiprocessing. Microkernels. Thread and multiprocessing management in modern operating systems. Synchronization. Mutual exclusion. Semaphores and monitors. Message passing. Deadlock detection and avoidance. Thread synchronization in modern operating systems. Memory management. Virtual memory. Uniprocessor scheduling. Multiprocessor scheduling. Real-Time scheduling. Disk scheduling. Disk scheduling in modern operating systems, I/O management. File management in modern operating systems, Distributed processing. Client – Server architecture. Clusters. Distributed process management. Computer systems security.

Laboratory:

Practice exercises in both a Unix operating system environment and the disk operating system. Windows XP version.

4CI04 Signals and Systems

Signals (definitions, signal categories, multi-dimensional signals, discrete time signals, continuous time signals, deterministic and stochastic signals, duration, causality, energy and power, periodicity, symmetry, signals operations, linear convolution, correlation, discrete time random signals, two-dimensional signals)

Continuous Time Fourier Transform – CTFT (definition, pairs, properties, CTFT of power signals, CTFT computation, meaning of CTFT). Discrete Time Fourier Transform – DTFT (definition, pairs, properties, DTFT computation, convolution via DTFT, DTFT of autocorrelation). Laplace Transform (one-sided Laplace Transform, pairs, region of convergence, properties, initial value theorem, final value theorem, inverse Laplace Transform, double-sided Laplace Transform). z-Transform (double-sided z-Transform, region of convergence, pairs, properties, z-Transform computation, poles and zeros, convolution via z-Transform, inverse z-Transform, signal stability). Systems (definitions, properties, LTI systems, LTI systems properties). Continuous Time LTI Systems (description using differential equations, frequency response via CTFT, transfer function via Laplace Transform, system stability). Discrete Time LTI Systems (description using difference equations, FIR, IIR, solution of difference equations, frequency response via DTFT, transfer function via z-Transform, feedback system).

4CB05 Anatomy and Physiology II

Description of the structure and function of human systems: cardiovascular system, nerve system, sense organs, urinary system, male and female reproductive system and endocrine system.

4CB06 Biostatistics

This course is an introductory course on biostatistics, which acquaints the student with the basic concepts and methods of biostatistics, their applications, and their interpretation. Moreover, this course is structured in four parts introducing students to the basic concepts of non-parametric statistics and regression, categorical data analysis, survival analysis and clinical trials. Analytically, in the first part of this course, students are taught to understand non-parametric hypothesis testing using the Kolmogorov-Smirnov test, sign test, the Wilcoxon test, the Mann-Whitney test, the Kruskal-Wallis test and others. Furthermore, it

introduces to the students the theory of simple and multiple regression, as well as, their applications in the field of biological and medical research. In the second part, students are taught the basic procedures for analyzing categorical data. Specifically, they learn how to create contingency tables, how to apply Chi-Square tests, calculating odds ratios, as well as, performing logistic regression. In the third part, students are taught statistical methods for censored survival data arising from follow-up studies. Specifically, students are getting familiar with life tables, Kaplan-Meier survival curve estimator and Cox proportional hazards model. In the fourth part, the course aims at the implementation of selection and estimation procedures with emphasis given on human populations. The students are informed on sampling techniques such as stratified, and cluster sampling; multistage procedures. Also, in this part of the course, a thorough description of clinical trials and the corresponding theory is given (types, designing problems etc). The computer is used throughout the course, and the student gains much familiarity with the well known software package SPSS.

3rd YEAR
5th Semester

5CI01 Databases

Introduction to Database Management Systems (DBMS). Architecture of a DBMS. Data modeling data with the Entity-Relationship model. Relational model. Relational algebra and relational calculus. SQL Language. Design of a database. Physical organization of a DBMS. Storage media. File organizations and indexes. Tree indexes and files (B-trees, B+trees). Random static and dynamic files (hashing). Processing and optimization of queries. Transaction processing and concurrency techniques. Recovery techniques. Techniques of security and authorization.

5CI02 Introduction to Telecommunications

Stochastic processes. Elements of information theory. Limitations in data communications. Simplified model of a digital communication system. Source coding. Quantization. PCM, DPCM, Delta modulation. Channel models. Digital transmission through the Additive White Gaussian Noise (AWGN). Pulse amplitude modulation, PAM. Digital modulation, FSK, PSK, ASK, QPSK, QAM. Digital transmission through bandlimited AWGN channels. Intersymbol interference and suppression methods.

5CI03 Software Engineering

Defining the software engineering. Software development life cycle. Software development models. Waterfall model. Iterative and incremental model. Formal methods. Software documentation. Requirements and initial analysis. Specifications. Systems analysis and design. Architectural design. Software architecture. Distributed systems architecture. Object oriented design. Real Time systems design. Software components reuse. User interfaces. Software testing verification and validation. Software project management. Systems development design and control. Software maintenance.

5CB04 Bioinformatics I

Definition of bioinformatics. Data types in bioinformatics. Databases: Scientific literature databases. Sequence databases. Structure databases. Fold databases. Information retrieval systems and database management systems (SRS, Entrez). Sequence alignment: Sequence homology and sequence similarity. Dynamic programming. Global alignment and the

Needleman-Wunch algorithm. Local alignment and the Smith-Waterman algorithm. The statistical significance of local alignments. Substitution matrices. Gap penalties. Heuristic alignment methods (FASTA, BLAST). Multiple sequence alignment. Multidimensional dynamic programming algorithms. Heuristic methods (CLUSTAL, DIALIGN, MULTALIN etc). Phylogenetic inference and multiple alignments. Prediction algorithms using protein and DNA sequences: Prediction of protein and RNA secondary structure. Prediction of transmembrane segments of proteins. Gene finding. Multiple alignments using hidden Markov models. Protein classification. Structural bioinformatics: Representation of protein structures. Protein fold recognition. Structure superposition. Homology modelling. Threading.

5OI01 Applied Mathematics

Differential equations and introduction to complex analysis: Seperable differential equations. First order linear differential equations. Exact and non-exact equations. Integrating factor technique. Second order linear differential equations with constant coefficients. Method of variation of parameters. Method of undetermined coefficients. Euler equations. Systems of differential equations. Linear systems. Homogeneous / Non-homogeneous linear systems. Euler's method for systems. Complex numbers and complex functions. Analytic functions. The Cauchy-Riemann equations. In this part of the course, students are introduced to multivariate data analysis and to the use of multivariate normal sampling theory. They learn how to treat multivariate data and how to estimate the mean vector, the variance-covariance matrix and the correlation matrix, as well as, how to create linear transformations of random variables and graphical representations of multidimensional data. Moreover, in this course students are taught to perform one- and two-sample tests in multivariate data sets, profile analysis, partial and multiple correlation and multivariate ANOVA, discriminant analysis, principal components, factor analysis, and cluster analysis. In this part of the course, students are introduced to the basics of stochastic processes. Specifically, after learning basic terms, students are introduced to simple Markov chains (discrete time); recurrence, transience, stationary distributions; Poisson processes (continuous time) and their simple simulations using examples from biology and genetics.

5OI02 Computer Graphics

Introduction, graphics processing pipeline and devices for graphic I/O, algorithms for drawing line segments, circles and conic sections, antialiasing techniques, polygon filling algorithms, line and polygon clipping. Affine transformations in 2D and 3D, homogeneous

coordinates, transformation composition, window to viewport transformations. Illumination and shading models. Representation of objects and images, surface triangulation algorithms, surface and volume rendering and applications in bio-medical data. Bezier and spline surfaces, surface representation and deformation, application to modeling of anatomical organs. Three dimensional geometric transformations, application to spatial cross-modal image registration. Information fusion from different imaging systems, color models, halftone and dithering.

5OI03 Information Theory and Coding

Basic concepts of information theory--entropy, mutual information, channel capacity, information rate, Shannon's noiseless coding theorem and Shannon's fundamental coding theorem; modeling of information source; Markov models. Channel coding. Analysis and design of error-control channel codes--Hamming distance, binary linear codes and the parity-check matrix, Hamming codes, checksum codes, cyclic codes and the generator polynomial and CRC codes. Cryptography and information theory.

5OB04 Digital Biosignal Processing

Basic principles of digital biosignal processing. Time-domain and frequency-domain methods, cross-correlation, spectral analysis, convolution. Design and properties of analog and digital filters. Discrete time biosignals. Discrete time Fourier transform. Fast Fourier transform. Time-frequency analysis and wavelet transform. Pattern recognition and neural networks. Applications in ECG, EEG and EMG. Laboratory exercises using MatLab.

5OB05 Genetics of Inherited Diseases - Population Genetics

Introduction. History of evolutionary thought and genetic. Molecular base of heredity. Genetic material and genes. Racial reproduction. Mutations. Laws of Mendel. Qualitative and quantitative hereditary characteristics. Complex heredity. Interactions of genes. Epistasis. Frequencies of the genes in the populations. Law of Hardy-Weinberg. Deviations from the law of Hardy-Weinberg. Linkage disequilibrium. Inbreeding. Mutations. Genetic recombination. Genetic flow (immigration), Genetic drift. Effective size of population. Founder effect. Adaptability, selection and models of this. Types of selection (balancing, directional, disruptive, frequency - dependent, sexual, r and K selection). Altruism. Group selection, kin selection. Study of complex genetic inherited diseases. Linkage studies, association studies (family-based case-control studies, population-based case-control studies). Genetics polymorphisms (SNP) and diseases. Large-scale analyses. Meta-analysis

of genetic association studies. Examples of complex diseases of which have been proved genetic base. Study of serious genetic diseases in human with emphasis in the molecular mechanism of action Timely diagnosis and prevention. Hemoglobinopathies (Mediterranean anaemia, drepanocytic anaemia), hemophilia, cystic fibrosis, muscular dystrophy, Huntington's disease, metabolic diseases (phenylketonuria, galactosemia, intolerance in lactose, metabolic deficiency of glycogen, deficiency of G6PD). Prenatal diagnosis. Genetic counselling Preventive control program of nurslings.

6th Semester**6CI01 Digital Communications**

Quantitative and qualitative analysis of analog signal transmission over digital communication systems. Practical sampling and problems from signal recovery. Quantization techniques and quantization noise. PCM. Bandwidth demands. Noise in PCM systems. Differential PCM systems and channel noise effect on PCM systems. Delta modulation systems. Bandwidth demands and signal to noise ratio (S/N). Comparison of PCM and DM with TDM, AM and FM as well as with the baseband system. Introduction to spread spectrum communications (CDM). CDMA multiple access systems. OFDM system.

6CI02 System Analysis

System, subsystem and environment. Traditional method of systems development. Modern methods and procedures of systems development. Data collection techniques. Decision tables. Decision trees. Data analysis. Principles of systems design. Structured systems development. Object oriented development. Computer aided systems engineering.

6CB03 Health Information Systems I

Importance and utility. Medical data: Acquisition, storage, use, medical decision making. Data structures. Data bases. Networks and communication protocols. Health Information Systems design and evaluation. Applications: Medical record, hospital information system, radiology information system, laboratory information system, pharmaceutical information system, administrative information system of material and anaesthesiological administrative information system.

6CB04 Technology of Medical Equipment

Principles of design and development of medical equipment, Basic principles of Biomedicine, Electronics and measurements with emphasis on operational characteristics and the selection of inverters, instruments and systems for the collection and processing of biomedical data, Devices of recording bio signals of (pressure, flow, bioelectric dynamics, temperature) and amplifiers. Sensors and biosensors: chemical, electrochemical, optical. Networks of biosensors and medical surveillance.

6OI01 Theory of Programming Languages

Introduction to language design. Historical background and remarks. Types, variables, statements. Program structure (formal and object oriented architectures, alternative program architectures). Processes. Operations. Functions and methods (parameters, memory administration, recursion, parametric subprograms). Data structures (arrays, aggregation and classes, dynamic data structure, strings, union, files). Heredity and dynamic interface, (polymorphism, abstract methods and classes, multiple heredity, heredity behavior). Functional languages (Lisp language, syntax and semantics, FP programming languages, modern functional programming languages). Concurrency and networking (process synchronization and communication, web-based programming, real-time programming). Logic programming (Prolog, data types, lists). Syntactic. Semantic. Inputs/Outputs. Graphical user interface. Future aspects, exercises.

6OI02 Pattern Recognition

Pattern recognition systems. Bayesian classifiers, k-nearest neighbor. Parametric estimation of probability density function (maximum Likelihood estimation, maximum a posteriori). Non parametric estimation of probability density function (Parzen windows). Linear classifiers, non linear classifiers. Perceptron algorithm. Multilayer neural networks. Feature generation: contour representation and contour tracing, chain code, polygon, signatures, linear transforms, Fourier Transform, regional features, image recognition, bias and variance, texture.

6OI03 Operational Research

Introduction to Operational Research (OR). OR models. Algorithm complexity and NP-hard problems. Linear programming: simplex algorithm, duality theory, transportation problems. Integer programming: Branch and bound, set covering and partitioning, dynamic programming, knapsack problem, generalized knapsack problem. Heuristic algorithms: performance evaluation measures, vertex covering, maximal independent subset, upper and lower bounds. Local search methods: neighborhood search methods, the travelling salesman problem, graph partitioning. Simulated annealing: Metropolis algorithm, the maximum cut problem. Applications.

6OI04 Wireless Communication Systems

History. Frequency reuse. Cellular systems. Multiple access techniques for wireless communications. Channel assignment strategies. Handoff. Interference. Capacity. Power

control. Path-loss models. Shadowing. Fading. Fading mitigation techniques. Mobile communications systems (GSM, DECT, TETRA, UMTS). Simulation tools.

6OB05 Bioinformatics II

Algorithms in bioinformatics: Dynamic programming in bioinformatics. Algorithms for local and global alignment. The algorithms of Needleman-Wunch, Smith-Waterman, Gotoh and variants. Other applications of dynamic programming. Hidden Markov models in bioinformatics. Forward and backward algorithms. Decoding algorithms (Viterbi, N-Best, Posterior, Posterior-Viterbi, OAPD). Parameter estimation using Baum-Welch and Gradient Descent algorithms. Class HMMs. Algorithms for labeled sequences. Algorithms for incorporation of experimental information in HMMs, profile HMMs. Heuristic methods in bioinformatics. The Gumbel's extreme value distribution and its application in bioinformatics. Clustering methods in bioinformatics. Genetic algorithms in bioinformatics. Neural networks in bioinformatics. The PERL programming language (Scalar variables, operators, lists, arrays, hashes, control structures, I/O, pattern matching and regular expressions). Applications in bioinformatics. Special topics in bioinformatics (Comparative genomics, functional genomics, structural genomics).

6OB06 Telemedicine

Definition and applications of Telemedicine (What is Telemedicine / the prospects of this scientific field). The main phases (stages), according to the technological evolution. Telemedicine in Greece and in a global level. Conclusions. Physiological and anatomic data acquisition systems (Cameras: CRT, CCD, CMOS, Scanners: Image quality issues. Other special mining systems). Minimal technical requirements from computing systems and warehouse systems in telemedicine service. Computing systems. High computing output requirements. Data storage systems (Magnetic systems, mixed systems, visual systems- laser appliances, other systems). Types of information transmitted and standards, during Telemedicine practice. Static images (DICOM and other patterns). Computer supported cooperative work. Video (Basic protocols of recording and transmission). Main Telemedicine applications. Teleradiology. Telepathology. Telecytology. Telecardiology. Teleoncology. Telesurgery. Telepsychiatry. Teledermatology. Telemedicine in primary health care places. Quality control and quality safeguard in Telemedicine. Internet in Telemedicine. Distant learning, teleteaching and telework. Data safety and privacy. Legal and ethical issues. Financial and administration issues. Social impact and dissemination of "know-how".

4th YEAR
7th Semester

7CI01 Internet Application Technologies

Client / Server architecture. Relevance to the WWW architecture. N-tier architectures. The role of the web server. Application servers. Personalized web (middleware-corba, activeX, transaction servers, queues). Design and modelling Programming with Internet protocols and HTML, DHTML, XML, etc.. Server side programming using JSP, .NET, PHP, web-database interconnection techniques. Design and development of Internet applications.

7CB02 Health care Systems Management and Administration.

Greek Health System: introduction to structure and function. International health care systems. Comparison of health care systems. The future of health care systems. Managerial issues, provided health services, legislation, evaluation of health care system, policy and directions of European Union.

7OI01 Artificial Intelligence

Foundations of Artificial Intelligence (AI). History of AI. Problem solving and problem representation. Search algorithms. Blind search algorithms. Heuristic search algorithms. Constraint satisfaction problems. Knowledge and knowledge representation. Reasoning and Logic. Uncertainty and Fuzzy logic. Knowledge systems. Planning problems. Autonomous programs (agents) and distributed AI systems. Non symbolic logic. Evolutionary and Genetic Algorithms. Neural Networks. Applications of AI.

7OI02 Graph Theory

Basic parameters of graphs. Problem modeling with graphs. Directed graphs, complete graphs, bipartite graphs, planar graphs, sub-graphs, isomorphic graphs. Connectivity concepts, Eulerian graphs, Hamiltonian graphs: applications in telecommunication networks. Graph coding. Maximum spanning tree. Min cuts for the Traveling Salesman problem. Graph Searching. Optimum paths. Graph partitioned levels, Bellman algorithm. Time-programming problems, critical paths. Flows in networks, max flow, max flow- min cut theorem, max cuts and minimal cuts networks, maximum flow min cost-applications on network design. Euler searching, conditions, directed and no directed case, algorithm complexity. The Chinese Postman problem. Matchings and job assignments. Transfer networks, NP-complete problems. Concept overlap. Graph coloring problems. Vertex

coloring and independent sets. Polynomial cases for specific topologies (spanning distance, complete graph).

7OI03 Theory of Computation

Induction proofs and recursive definitions. Introduction to models of computation. Primitive recursive functions and relations. Partial recursive functions and minimalization. Computability. Turing machines and Turing computable functions. Church - Turing thesis. Basic Theorems: Normal form, enumerability and s-m-n Theorem. Recursive enumerable sets and unsolvable problems. Definability and arithmetical hierarchy. Turing reducibility and degrees of unsolvability. Computational complexity. Deterministic and Non-deterministic Turing machines. The classes P and NP. Polynomial time reductions and NP-completeness. Cook's Theorem. NP-complete problems and reductions.

7OI04 Human Computer Interaction

Introduction to Human-Computer Interaction (HCI). Definition of HCI, historical background. Interaction techniques, historical background. Knowledge references, optical perception, knowledge models, human processor model, Norman's user-system interaction model, distributed models, knowledge representation and mental models, principles of interactive system design. The 3 pillars, design outlines, icon design. Design evaluation, definition factors of technical evaluation, means of evaluation (laboratory study, field study). Technical evaluation of system design (Cognitive walkthrough, heuristic evaluation, review-based evaluation, model-based evaluation). Construction evaluation, evaluation techniques of a constructed system. Empirical methods of experimental evaluation, observation methods, interpellation techniques. GOMS model family, evaluation based on GOMS models, GOMS models, applied analysis of GOMS on design. Keystroke-Level Model (KLM), Card, Moran & Newell GOMS (CMN-GOMS), Natural GOMS Language (NGOMSL), Cognitive-Perceptual-Motor GOMS (CPM-GOMS). Web design. Electronic commerce design. Design for all – design for people with special needs.

7OB05 Medical Decision Support Systems

Design and development of computerized therapeutics and diagnostic decision support systems. Application of advanced statistical tools, decision theory, artificial intelligence, modeling and simulation techniques in medical decision support systems. Introduction to knowledge based and learning systems. Validation and evaluation methods for medical decision support systems.

7OB06 Medical Imaging Systems

Introduction to medical imaging. Elements of digital image processing. Principles of tomographic imaging, emission and transmission tomography, image reconstruction techniques. X-ray computer assisted tomography (CT): Xray production, CT systems, clinical applications, security aspects. Nuclear Magnetic Resonance (NMR): physical principles, pulse sequences, relaxation processes, data acquisition and image reconstruction techniques, Magnetic Resonance Imaging (MRI) Systems, security aspects. Single photon emission tomography (SPECT) and positron emission tomography (PET): physical principles, radioisotope production, radiation detection, image reconstruction algorithms, clinical applications, security aspects. Diagnostic ultrasound: physical principles, ultrasound generation and detection, imaging techniques, clinical applications.

8th Semester**8CI01 Computer Systems Security**

Introduction to security, basic definitions, usual security threats, special requirements for network environments. Approaches to accomplish security. Protection mechanisms, identity check, access check, securing techniques. Computer resources protection in the Internet. Firewalls, service wrapping and relevant techniques. Introduction to encryption and keyword administration, cryptography, symmetric and non-symmetric algorithms, public keyword check, digital signatures, references on cryptanalysis techniques. User security on the Internet. Dangers from active content exchanged in the Internet and protection methods. Security framework for Javascript and Java. Virus problems, what is a virus, kinds of viruses, ways of infection, techniques used by viruses, software and methods to confront viruses. Susceptibility detection tools. General definitions, their role, control methods, examples. Intruder alert systems, reason for use, general model, system architecture, special characteristics and techniques, ways of reaction.

8CB02 Biomedical Image Analysis

Digital medical image processing fundamentals. Image enhancement, segmentation, registration, interpolation, visualization and fusion of medical images. Pattern analysis and texture, border analysis of salient objects. Motion compensation techniques. Applications in computational microscopy, digital mammography, ultrasounds, magnetic resonance and computational tomography images. Exercises and laboratory with the use of Matlab environment.

8OI01 Data Mining & Knowledge Discovery

Introduction to data warehouses. Design, implementation and use of data warehouses. Multidimensional data model. Data cube and its processing. On-Line Analytical Processing (OLAP) in data warehouses. Differences between OLTP (On-line Transaction Processing) and OLAP. Data transfer from existing databases – procedures of extraction, transformation and loading (ETL). Processing of queries in data warehouses. Introduction to data mining. Data preprocessing. Data mining primitives, languages, and system architectures. Concept description: characterization and comparison. Mining association rules in large databases. Classification and prediction. Clustering. Mining data of complex type, e.g. text, images, web data. Data compression.

8OI02 Embedded Computer Systems

System development methodology, milestones. Advanced techniques of logic design, microprocessor use with interrupts for the implementation of real-time systems. Use of SRAM in system design. One-hot method. Calculation of the critical path. PAL/GAL/FPGA technology. CAD tools. System design and problem addressing with the use of CAD tools. Delays inside and outside of Large Scale Integration circuits. Low-power dissipation issues and methods of power management, supply systems, autonomy of a system. Hardware-Software co-design methods, system modeling. Modification of embedded software. Rapid system development. Design for constraint logic complexity or number of pins. Signal transmission models, extraction, precise simulation. Constrained design. Real-time applications constraints. Technologies for calculation, storage, I/O, communication. System decomposition and partitioning. Complexity management. Design of systems and sub-systems. Counter effects due to Integration scale minimization. Design for under 10,000 gates, 10,000-1000,000 gates, and above 100,000 gates. Model of hierarchy. Design for verification. Fault detecting-testing methods (debugging) for large, complex, or high-speed systems. Static and dynamic power dissipation (calculation and estimation), cooling methods. Low-power dissipation for autonomous systems. Testability, Verification and quality control. Embedded computer applications, paradigms from the hi-tech market (mobile phones etc.).

8OI03 Distributed Computing Systems

Mathematical introduction, fundamental models of parallel and distributed computing. Single Instruction, Multiple Data (SIMD). Parallel Random Access Machine Models (PRAM). Exclusive Read Exclusive Write (EREW). Concurrent Read Exclusive Write (CREW). Concurrent Read Concurrent Write (CRCW). Multiple CPUs Machines - Multiple Instruction, Multiple Data streams (MIMD) - (tightly coupled (TC-MIMD), loosely coupled (LC-MIMD)). Systolic architectures, wave front arrays, classification of parallel algorithms, complexity of parallel algorithms, performance parameters and evaluation, boosting performance techniques, fairness, merging and classification to PRAM machines, selection and searching in PRAM, matrix computations, network analysis, web service architecture, lab assignments.

8OB04 Automatic Control Systems and Applications in Biomedicine

Introduction to Automatic Control Systems (ACS). System representation (block diagrams, signal flow graphs). Revision of Laplace Transform. Transfer functions of various

servomechanisms. DC Electromechanical ACS. Hydraulic and Pneumatic ACS. Stability criteria. Analysis of ACS in frequency domain (Nyquist, Bode, Nichols). Second order systems. Steady state and transient response specifications (sensitivity, error, rise time, overshoot, speed etc). Performance indices (IAE, ISE, ITAE etc.) Root locus compensation (cascade compensation using lead, lag, lead-lag circuit). Direct and Inverse Polar Plots. Compensation methods in frequency domain (by direct and inverse Polar plots, Bode plots and Nyquist Plots). Stability of ACS in frequency domain (gain margin, phase margin, Nyquist criteria). Industrial control design via three term (PI, PD, PID) controllers. Compensation methods via feedback control.

8OB05 Medical Information Systems II

Methodologies of Medical Information Systems (MIS). Workflow management and system integration. Administration of medical information systems. Web based medical information systems. Medical data in electronic health records. Coding and standardization. Classification systems ICD-10, MeSH, SNOMED, ICNP. Electronic health records implementation standards ISO/TC215 and CEN/TC251. Medical SW life circle modelling, user requirements methodologies, the CASE tool. Development of applications for Hospital Medical Information Systems (HMIS).

8OB06 Health Economics

History and objective of Economic science. Theory of consumption. Theory of production. Theory of demand, supply and balance in market. Theory of cost, revenues, profit. National accounts. Economic theory in health care services. Special features and evolution. Theory of healthcare production, as a public and private good. Payment methods of health providers. Demand, supply and balance in healthcare sector. Utilization (consumption) of healthcare. Healthcare expenditures and financing. Socioeconomic evaluation of Healthcare programmes . Methods of economic evaluation. Evolution and future of demand, Production and utilization determinants of health care.

8OB07 Simulation of Biological Systems

Introduction to modeling techniques. Modeling of physiological systems. Control theory for linear and non-linear systems. Analysis and identification of open-loop and closed-loop physiological systems. Physiological systems simulation and control based on artificial intelligence methods. Applications from cardiovascular, respiratory and metabolism system. Analysis and simulation of physiological systems using specific software package.

Computational requirements and architectures.

8OB08 Special Topics on Bioinformatics & Bioethics

Introduction: Science and sciences, types of sciences (analytical sciences, humanitarian sciences, moral-canonistic sciences), rules of scientific research, scientific research and ethics, biological research and ethics. Topics on Bioethics: Introduction to moral sciences and Ethics, Bioethics, specific topics on Bioethics (Darwinism, social Darwinism and eugenics, euthanasia, genetic engineering, cloning, in vitro fertilization, clinical trials and experimentation on animals and humans, organ donation and transplantations, biomaterials' safety). Topics on Bioinformatics: Genomics (genome sequencing, storage and study of genome information, genome databases, polymorphism in the human genome and association with diseases), comparative genomics (genome subtraction method, whole-genome alignment methods, genome-context methods, gene-fusion method), structural genomics (the scientific program of structural genomics, target selection in structural genomics), functional genomics (integration of experimental and computational methods, proteomics, gene-expression data and DNA micro-arrays, regulatory networks, protein-protein interaction networks).

Free Optional Courses (General Knowledge)

00C01 Introduction to Political Economy

The economic problem and the science of economy. The general framework of the functioning of the common market. The concepts of demand and supply. The price/listing formation. The theory of the consumer's choice and demand. Application/ implementation of the price fixing theory. The production and cost theory. The enterprise with perfect competition. Monopoly. Foreclosure competition and oligopoly. International production and transnational corporations. The industrial structure. The role of the State. Public goods. Intervention to monopoly. Externalities. The domestic and the national product. Inflation. Employment and unemployment. The overall demand and supply and the national product. Consumption, investments and saving. The definition of income. Public authorities and the income balance. Money, the banking network and the monetary policy. The IS-LM model. The monetary issues in international economy. The international economic swap. Economic development and under-development. Investment activity: choice and valuation. Economic integration in Europe.

00C02 Public Relations

Concept and contents of public relations. Main principles of public relations. Tasks and presuppositions for the implementation of public relations. Programming of public relations. Cases of public relations. Measuring public relations effectiveness.

00C03 Sociology

The developments in the sciences of Genetics, Biology and Information technology placed the society of citizens in front of urgent choices to be made: Which are the limits of lawful frames that should be placed? Which is the states' role in a multi-powered field? Which are the limits and the reason of market society? And finally which are the limits of the choices and the wishes of the social subject? This course aims to the systematic study of social behaviour, both in individual and in collective level, of the processes of constitution and change of social structure, and of the adoption and differentiation of cultural practices. Thus both in the level of macro-analysis and in the qualitative research level of micro-approaches that are materialized in the framework of modern sociological thought, we define and analyze the transformations of modern socialization, resulting from the most rapid developments in the sectors of New Technologies (ICTs), Biology and Genetics, developments that re-define the rules of social subjects' action.

00C04 Public Law

Task of teaching public law is the presentation of the basic knowledge concerning the institutions of the state and the basic principles. It contains three sections:

- a) Introduction to Greek law.
- b) Analysis of basic constitutional principles and institutions of the Greek state (electoral body, parliament, Government, President of the Republic); organization and function of public administration.
- c) Analysis of individual and social rights and main issues of Information and Computer Technology Law (ICT-Law).

00C05 Business and Innovation

Basic principles. Business and distinctions of enterprises. Foundation and organisation of business. Obligation of the enterprises. Encouragement of business. Policy and promotion of enterprising. Management of human resources (employment, education, payment, discharge). Building communication capability through interpersonal competence. Business performance and communication excellence. Finances, enlargement, definition of the tasks of the market. Market research. Business development. Budget. Financing. Management of the financial capital (brand names, trademarks). Mergers and acquisition.

00C06 Introduction to European Union Law

Principal sources of European Community law. Overview of the legal framework of the European Union. European treaties (primary and secondary legislation - regulations, directives and decisions). Law and Finance of EU. Law making Institutions (European Commission, European Parliament, Council and the Court of Justice). Decision-making processes. Internal Market (free movement of goods, persons, services and capital) and competition.

00C07 Didactics of Informatics

Introduction to modern epistemological approaches and their representative teaching and learning theories (positivism, empiricism, constructivism, etc.). Didactics principles. Teaching models. Teaching aims and learning objectives: transformative design. Interdisciplinary and crosscurricular science education. Educational research methods – examples of empirical research. Use of ICT in modern teaching and learning methods. School education as a means of compensating for social inequalities (due to poor socio-

economic background, ethnic minority issues and stereotyping or special educational needs).

00C08 Educational Science

Introduction to the psychological and sociological dimensions of the educational “microworld” (elements of Social Psychology and Sociology with special focus on the psycho-social group dynamics and on social issues that initiate debates). Applied pedagogy. Field application of pedagogical principles. The educator as creator of the curriculum and leader of educational change

Foreign Language Courses

Foreign Language (English)

In order to obtain their degree in Informatics with Applications in Biomedicine students attend English language courses during the first four academic semesters of their studies.

The mark obtained by the student in these courses is not indicated in the report card but there is only the indication “pass” or “fail”.

Students are called to translate into Greek Informatics, Biomedicine and Bioinformatics texts in order to test their knowledge of the structure of the English language and basic terminology.

Students who have obtained Certificate of Proficiency in English (University of Cambridge) or Certificate of Proficiency in English (Michigan ECPE) are exempt from courses “English I” and “English II”. “English III” and “English IV” course outline include Informatics, Biomedicine and Bioinformatics terminology according to the respective curriculum courses.

V. LIBRARY

LIBRARY

INTRODCUTION

The Library of the Department of Informatics with Applications in Biomedicine aims at contributing to:

- The support of educational and research needs of the academic community.
- The dissemination of information to the public.

LIBRARY OBJECTIVES

The D.I.B. Library mainly aims at:

- the existence and formation of the most appropriate room for its most efficient use
- the continuous enrichment and update of its collections
- the most efficient organization and management of the collection material cataloguing
- ensuring the necessary equipment, in order to support the staff's and the users' needs
- obtaining the resources, in order to cover the Library's current and future needs
- employing the most efficient and educated personnel
- the promotion of its services, along with the publication of information leaflets
- the connection to other Libraries
- ensuring its operation in working hours suitable for its users
- the provision of proper training to its users, through seminars

LIBRARY USERS

All members of the University community - such as the teaching staff, undergraduate or postgraduate students and the administrative staff - are entitled to borrow books. However, they should carry and provide when requested their Library Card. This card is issued by completing an application form; the students should provide their passes and the rest of the members of the University should provide their I.D cards. The public has also the right to use the Library material, but only for reading.

USERS' RIGHTS

The Library users have the right of access to all the services and the Library material, depending on the category. The Library personnel is responsible for doing their best, in order to offer the proper services.

USERS' OBLIGATIONS

Also, it is the right of one using the Library to enjoy reading in a civilized, clean and quiet reading room. Therefore, all users of the Library facilities Services are requested:

- to keep quiet in the reading rooms
- to refrain from eating and drinking in the Library premises
- to refrain from smoking in the Library premises
- to treat the Library material with respect (e.g. they must return books, periodicals and any item in the same condition they borrowed it)
- to make sensible use of all Library furniture and equipment
- to turn off their cellular phones when entering the Library premises
- not to throw papers or any kind of litter in the rooms they use

Also, the Library users must:

- not arrange the items they used in shelves
- leave all personal items and property in the designated area in the Library
- not use the photocopy machines for material not included in the Library items
- use the Library computers only for educational and research purposes

It is worth mentioning that the Library users are allowed to carry and use their own laptops.

BORROWING

As it was mentioned above, the University Library operates as a lending Library. However, the Library material is divided in items which can be borrowed and in those which can not be borrowed.

- Readers can not borrow: all of the informative material (including encyclopedias, dictionaries, CD- Rom, e.t.c.) periodicals, dissertations, old books and the relatively rare Library material.
- Readers can borrow: Any other kind of the Library material.

In order to use the Library services, the registration and the issue of the Library Card are provided. Along with their registration, the Library users state that they are aware of and accept the library regulations. The loan can be done through the keeping of the students' passes or ID cards, along with the issue of their Library Cards.

Borrowing card

The Library Cards are strictly personal. In case of loss or damage, the users have the right to apply for the issue of a new card.

Duration of borrowing

- Undergraduate – postgraduate students: They are allowed to borrow up to three (3) books, for the period of five (5) working days, with the right of loan renewal, unless another borrower has filed a request for the same item.
- Teaching staff: They are allowed to borrow up to five (5) books, in the period of fifteen (15) working days, with the right of loan renewal, unless another borrower has filed a request for the same item.
- Administrative staff: They are allowed to borrow up to two (2) books, in the period of five (5) working days, with the right of loan renewal, unless another borrower has filed a request for the same item.
- Other users: Other users do not have the right to borrow Library items. They may only use them in the Library rooms or photocopy them.

Renewal of borrowing

Each category users have the right of loan renewal of the item they borrowed up to two (2) times since the loan expiry, unless another borrower has filed a request for the same item.

Requests for books

Each user, who needs a book which has already been borrowed, has the right to file a request for it; there is a limit for these requests, up to two (2) working days (that is, if any Library user does not borrow the material he/she has filed a request for in two days period, then the request ceases to hold). In these requests there is an order of priority.

Loss or damage of the Library material

In case of loss or damage of the Library material, the user should inform the Library personnel and is obliged to replace the item. In case this item does not exist in the market, the user is obliged to replace it with an item with the same market value and topic.

Use of the Library's network

The Library users, who are interested in having access to the Library network, should receive a user name and password, offered by the Library personnel.

Photocopying

All the users have the right to use the photocopy machines, after receiving the special magnetic card required. The Library users are responsible for respecting the provisions regarding the authors' copyright. As for undergraduate students, in order to obtain their degrees, they have to file a transcript of their dissertations and return the material they have borrowed. When they return the material they used, the Library issues a certification that the students have no pending loans.

VI. USEFULL INFORMATION

USEFUL INFORMATION



The city of Lamia is the capital of the Fthiotidas prefecture and is located at the foot of Orthrys Mountain. There are many possible historical explanations for the origin of its name: a) The city of Lamia was built by Lamus, the son of Hercules and Omphale. b) According to Pausanias, the city was built by Lamia, who was the queen of Trachinians and daughter of Neptune. c) According to Aristotle, the word Lamia is an adjective of feminine gender and has the meaning of the district, the land or the city located between two hills. d) According to another explanation, the name of the city origins from the different order of the letters of the word “Malia”, the ancient name of the nearby district. During the Byzantine times, the city was renamed in “Zetouni” and was enclosed with walls.

Lamia is one of the biggest cities of the Greek region with a rich historical interest, social life and healthy climate. Nowadays, the city is populated with 80.000 people and developed in commerce, agriculture, stock farming and forestry. Also, there is a remarkable growth in industry, with an industrial area, located in an area of 1.500 acres, in a distance of 8 km away from the city centre.

It must be noted that Lamia’s Annual Fair, which takes place at the end of May every year, is really important for the city, for financial reasons.

In Lamia the visitors can visit an archaeological museum, the municipal theatre, the municipal conservatoire, cinemas, the municipal swimming pool and the stadium. Also, there are many cultural, mountaineering, naturalist and sports clubs.



Transportation

Urban Transport

The city of Lamia provides urban transport facilities (buses), which serve frequent routes to all the nearby districts. (Telephone number: +30 22310-22122).

The usual route from the premises of the University to the centre of the city is carried out every thirty (30) minutes, (quarter past - quarter to every hour), from 5:45 to 22:45, every day, by the Bus Number One (1). The reduced (student) public transportation fares for this particular route cost 55 cents. The route starts at the Parkou Square and finishes at the “Evritanes” district.

Taxis

At Lamia, radio-taxi services are provided. The most central taxi stations are in: Parkou Square, Amalias Street, Fleming Street (near the Dept. of Informatics with Applications in Biomedicine), Averof street, in the city of Lamia. Radio-taxi telephone number: +30 1300 and +30 22310-34555

Coach Bus

There coach lines for Athens, Thessaloniki, Patras and all intermediate stations. Lamia Coach Service Telephone: +30 22310-24895.

Railway Transport

The city of Lamia offers a connection to the Hellenic Railways Organization , via the Railway Station of Lianokladi district and the Local Railway Station, which is located in the city. The railway station of Lianokladi serves routes to all the Greek big cities. Tickets can be issued in the Local Railway Station (+30 22310-44883), in Travel Agencies, as well as in the Lianokladi Railway station (+30 22310-61061). With a small charge, the Hellenic Railways Organization buses undertake passengers' transport from the Lamia's Local Railway Station to the Lianokladi railway station and vice-versa.

Useful Webpages

University of Central Greece:

<http://www.ucg.gr>

Department of Informatics with Applications in Biomedicine (D.I.B.):

<http://dib.ucg.gr>

Network Operation Centre of the D.I.B.:

<http://noc.ucg.gr>

Municipality of Lamia:

<http://www.lamia.gr>

Prefecture of Fthiotida:

<http://www.fthiotida.gr>

Web – Sites related to Lamia :

<http://www.e-lamia.gr>

<http://www.mylamia.com>

http://www.lamia_world.gr

Map of Lamia and position of the University of Central Greece and the D.I B.:

<http://maps.google.com/> search for 38.9122, 22.4277

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DEPARTMENT OF INFORMATICS
WITH APPLICATIONS IN BIOMEDICINE