Postgraduate Studies in Health Informatics in Greece

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Abstract

Health informatics is a well established and important multi-disciplinary and inter-disciplinary field that not only involves informatics but also medicine, nursing, engineering, biology and other-related subjects. A co-ordination of this field at a postgraduate level has become an important issue now in Europe where other European Community programs such as the Telematics for Health Care will require during the Fifth and Sixth Framework Programmes (2000-2006) adequate human resources of higher potential and knowledge. A European M.Sc. course met all the above objectives. The curriculum was developed according to previous experiences in similar programmes. Recently the course has been organised on the basis of an Inter-University nature with the participation of 5 Greek Universities. The paper aims at providing a current description of the academic programme and a brief evaluation of the implementation phase.

Keywords:
Health informatics; Inter-University academic Programmes, health telematics education

1. Aim and Objectives of the Course

The aim of the course is to give those working or intending to work in the health service and related activities, a broad advanced postgraduate education in health informatics [1] in order to develop the ability to understand and evaluate in detail the theoretical and practical requirements of informatics in medicine, nursing and health care and to solve information related problems arising from the dramatic advancement of technology as it is being applied in health care across the European Union member states.

The course [2] is relevant to those holding a degree in one of clinical sciences, life sciences or physical sciences like: medicine, nursing, dentistry, pharmacology, physiology, pathology, biochemistry, biology, biophysics, pharmacy, sociology of health, engineering, computer science, mathematics, microbiology, clinical chemistry and health economics, as long as they are all University graduates.

The graduate acquires:

- A good theoretical background in relevant aspects of basic scientific and health disciplines which interact with the application of information science and technology to the acquisition, processing, interpretation, storage and communication of health data, in both health education and research and in patient care.
• A thorough training in the scientific method so that a problem may be assessed, experimental studies designed, available systems evaluated and a scientific or technical report prepared.

• An ability to understand the scientific basis of clinical and engineering problems encountered in medical, nursing and health care fields and a better understanding of the use of computers and knowledge-based computing methods.

• An ability to investigate advanced problems and to undertake research in health informatics.

2. Entry Requirements

Entrance to the course can be gained by those university graduates holding degrees in medicine, nursing and other health-care related professions, as well as in engineering and computer science who wish to work in the health service area. Graduates of any medical, nursing or health-related discipline, engineering, computer science or natural science may apply. Relevant experience in the health sciences will be taken into account for non-health related educational background. Applicants should demonstrate excellent command and knowledge both oral and written of the English language.

The following Greek Universities actively participate in the course by sending distinguished professors as well as enrolling students to the course: National and Kapodistrian University of Athens (Department, of Informatics, Department of Economics, Faculty of Nursing), Aristoteleion University of Thessaloniki (General Department of the Engineering School), University of Ioannina (Department of Medicine), Economics and Business University of Athens (Department of Informatics), University of Piraeus (Department of Production Technology, Department of Informatics). In addition, visiting scientists and visiting professors were invited to teach in the course. Until today professors came from the following institutions: University of Leuven, University of Madrid, University of Patras, National Technical University of Athens, King’s College and London School of Economics of the University of London, City University, University of Manchester, University of Maastricht, and the University of Amsterdam.

3. Course Pattern

The course is available for full-time students and will subsequently lead to the award of the M.Sc. in health informatics. Full-time students will attend for one full calendar year. Lectures and laboratory exercises will be held from Mondays to Fridays at the School of Health Sciences Campus of the University of Athens as well as for certain modules in the cooperating Universities.

The course comprises a total of 370 formal contact hours (lectures and laboratory exercises). Lectures and laboratory exercises start on the first week of October and finish at end of May. The successful students need a further term (summer term) to complete the research project and submit the dissertation.

In case the student wishes to take the course in part-time he/she will need a two-year period. Appropriate management of the course programme will be required to select the modules need to be able to graduate in the two-years period.
4. Lecture Course

The academic programme is modular and comprises of 370 of formal lectures given by distinguished professors and lecturers of the participating universities [2], [3]. The course is organised in 10 compulsory modules and in 7 optional modules (from which 5 should be selected). The lecture material is distributed to all students before the start of each module. A total of 3000 pages of courseware and didactic material has been already prepared and is ready for distribution to the students. The students are encouraged to seek for bibliography and textbooks in the Universities Libraries. The content of the course is organised in such a way in order to give to the students, competence in making decisions in solving healthcare problems related to informatics. To fulfill this the students must acquire an amount of knowledge, skills and attitudes. Therefore, an important principle of the course is to develop the ability for life-long independent learning and understand the principles of health informatics as they are applied to the informatics field. Such competence means that the student shall be able to:

- Identify his/her learning needs.
- Evaluate critically different sources of information.
- Evaluate his/her learning in relation to the needs.

The educational methods used in the M.Sc. course have been chosen to train the students in the skills listed above. The learning is directed by objectives. The students have the main responsibility for reaching the competence set and have great freedom to choose between various learning resources offered in the laboratory of health informatics at the University of Athens as well as to the other laboratories of the participating Universities. Teaching staff will stimulate and guide such an active learning in various ways. The studies are problem-based to a large extent. Computer-based cases are used to focus on problems raised in the different modules. The structure of the modules is the following:

A. Obligatory modules:

- Introduction to health informatics.
- Introduction to health sciences.
- Health research methods.
- Hospital Information Systems.
- Management and Administration of Health care systems.
- Database Management Systems.
- Security of healthcare systems
- Methods in developing information systems
- Networks
- Electronic Patient Record Systems

B. Optional modules

- Knowledge-based systems
- Telemedicine.
- Language engineering in healthcare
- Object-oriented programming – Java
- Signal processing and medical imaging
- Managing health technology - Biomedical engineering.
Electronic data interchange (EDI)
Knowledge Management

5. Laboratory Exercises

Strong emphasis has been given to the provision of proper technological infrastructure in the students facilities and laboratories. The health informatics laboratory of the University of Athens comprises of 40 computer systems connected in a Local Area Network. All students can work under Windows and/or Unix environment. Related health informatics applications and computer-assisted learning software is available to the students. International computer networks (Internet) can be reached through the high-speed link to the main computer network of the University of Athens, which in turn is connected to the main highway of the Greek Universities Network (GUNET). The multimedia laboratory adjacent to the health informatics laboratory offers a CD-ROM based library access to rich resources of reference information and didactic material. The newest strategy used in the M.Sc. course includes the use of the local Intranet to support the student in his/her preparation of reports and essays. Most of the modules require the preparation of small projects/essays. The student is offered also with all Internet facilities (access to international sites, libraries, e-mail accounts, etc.). Printing facilities are also available through laser printers (both colour and monochrome). The laboratory facilities of the other departments and universities are also available to students when needed.

6. Research Project

All students will undertake a research project as part of the M.Sc. course. The aim of the project is to provide the student with an opportunity to undertake research work applying appropriate concepts, methods and techniques of health informatics to a particular problem. The research work can be carried out at each of the participating Universities. The process would be that the student selects a research topic from those available within the programme and under the supervision of one of the Professors works on the subject, prepares, finalises and submits the dissertation to the examinations committee.

7. Examinations

Each module is examined by a 2-hour examination paper. The examinations are held in February and June of each academic year. All examination papers are considered of equal importance. In case of failure the student can take a re-sit examination in September. If he/she fails in more than 4 examinations in the February and June examinations then the student is dropped from the course.

In the end the M.Sc. degree is awarded to students who meet the following requirements:

- Obtain a minimum of 50% in each of the examination papers.
- Obtain a minimum of 50% in the dissertation during the oral defence in from of a committee of three examiners.
8. Course Evaluation

During the 12 years of running the course under the previous structure [2], the number of enrolled students amounted to 200. Students came from different European countries, such as Greece, UK, the Netherlands, Spain, Belgium, Ireland, Finland, Sweden, even from Romania and Republic of China. The students showed an active interest in supporting the various learning experiences offered by the course and were actively involved in several social and cultural events in Greece provided by the co-ordinating University. Despite the usual problems, which arise in such courses (i.e. different educational backgrounds mixed in, different cultural behaviours and customs) a spirit of active cooperation, focused determination and groupware effort prevailed in the end.

During the recent year of running the course under the structure presented above the students enrolled were 20. Since the course is full-time few working students (4) found difficult to participate with full attendance, therefore, they had to leave the course. An additional problem encountered was the number of reports/essays given to the students as assignments increasing the burden to the students. However, even if the full academic year is not finished, it should be reported that the students were very much satisfied with the course and expressed their gratitude to the high level of teaching and facilities encountered in all participating universities they had to attend lectures.

Only for the academic years in which the course operates as an InterUniversity – Co-operational Postgraduate program, 80 students in total have been accepted, and 50 of them have been graduated. Most of the remaining 30 have not completed yet their lecture courses (have been accepted in the present academic year) or they are undertaking their project’s dissertation (have been accepted in the previous academic year).

8.1 Evaluation by Students

The lecturers of each of the modules are encouraged to seek feedback from the students as an evaluation of the modules, both in terms of content and delivery. This has been achieved by a questionnaire and by direct feedback from the students to the members of staff. Student evaluation is taking place both during the course and after its completion per year. The evaluation was a major way of receiving feedback by the students, improving, thereafter, the course contents and delivery.

8.2. Evaluation by Staff

Members of staff provide course evaluation both by written comments and by discussion with members of the Steering Committee. The Steering Committee consists of one representative from each of the participating Universities. The Co-ordinating University of Athens is chairing the Steering Committee.

9. Conclusion

The M.Sc. course aiming to fulfill the above objectives will continue to operate in the following years. The course has been supported financially till recently with funds from the Greek Ministry of Education interlinked with the new EU initiatives of the structural funds and the SOCRATES/ERASMUS programmes. During the two recent academic years fees have been introduced to keep the momentum of the course as the initial financing by the ministry has ended. We have not observed any reduction of the number of applicants to the course due to the introduction of fees. Regarding the jobs that the graduates can find, we have
noticed recently a large need in the medical software houses and in the hospital EDP centers. The numbers are now accumulated and results can be announced soon.

The course overall in the forthcoming years has to adapt to the changes introduced by technology advancement and globalisation [4]. The course organisers are willing to undertake this challenge.

10. References


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