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Professor Ch Proukakis
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Dear Professor Proukakis:

Please find enclosed the Assessor Report, following my visit to Athens. I did enjoy very much my staying and I thank you very much for your warm welcome. Please extend my gratitude to your collaborators and in particular to Prof. Dimitriou and Prof. Damilakis. Do not hesitate to contact me again if I can be of any further assistance.

Sincerely Yours,

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Report of the external assessor of the first year of the Inter-University Post-Graduate Course on Medical and Radiation Physics (IPCMRP)

1. Preamble

The Inter-University Post-graduate Course on Medical and Radiation Physics (IPCMRP) is a theoretical-practical and in service training 2 and ½ year post-graduate course for the preparation of qualified Medical Physicist, in Greece. The program is run by a close collaboration of five Universities, namely: University of Athens (School of Medicine, Department of Physics and Department of Biology), University of Ioannina (Department of Medicine), University of Thrace (Department of Medicine), University of Chrete (Department of Medicine), University of Thessaloniki (Department of Medicine) and two research centers, the Greek Atomic Energy Commission (GAEC) and the NCRS Demokritos.

I was asked to assess the first year of this program. Hence, I will restrict myself to the evaluation of the first year program, but its consequences on the following years will be also considered. This report is organized as follows: a description of the working method of the assessment is given, followed by the description of the program to be assessed with a special emphasis to the first year theoretical lessons and laboratory exercises. Then the student body, the staff involved in the program and the facilities at disposal are briefly illustrated. Finally the summary of the finding are presented together with some recommendations for the future of the course.

2. Working method

The assessment was done over a period of two full days visit (13 and 14 April 2000) in Athens, by using the following procedure:

- During the first day I was introduced to the course structure at GAEC, where I had also the possibility of having an informal meeting with the students enrolled in the first year. I visited the facilities of GAEC related to this course (both lecture halls and laboratory structures). I was shown the Demokritos center facilities utilized by the course, in particular the radiopharmaceutical and the radiobiology laboratories.
- The second day was devoted to the visit to the University Hospital, where most of the laboratory exercises of the second semester are held, and to the visit of the Medical School of Athens University, where most of the Medical courses are taught during the first semester. At the University hospital I had the opportunity of interviewing some students enrolled in the second year of the course, with reference to their first year experience.
- In addition to the site visits and official meetings with the staff, I took the advantage of after-hours informal meetings with the coordinator and various staff members of the course, so as to clarify and better focus the knowledge I gained during the official visit.
- Neither self-assessment material nor assessment of the course by the students was provided. Information on student history, dropout and employment after course completion was unofficially given to me by staff members.

3. The program

The aim of the 2 and ½ year course is to prepare qualified Medical Physicists to work mainly in Hospitals in Greece. Hence the emphasis is put on the preparation for the profession. The research aspects are most relevant, but considered as a mean to acquire the competency necessary for the profession of Medical Physicist.

During the first year the students are given the knowledge in the fundamental fields of Physics, Medicine and Mathematics as a necessary prerequisite for the second year and for the third half year in service training. The teaching (both theoretical and practical) of the first year takes places at GAEC, University of Athens and Democritos Center. For the remaining 1 and ½ year of the course, the student makes an "in service" training at one of the collaborating universities, as much as possible in accordance to their stated preference at the entrance of the course. Since I was asked to assess the first year, in the next sections I will restrict my analysis and considerations to the first year of the course.

3.1 First semester theoretical lectures

During the first semester, the students are given various courses in Physics, Medicine and Mathematics. All courses have a coordinator and various teachers. There are approximately 225 hours of lectures and 30h laboratory exercises. The students take exams for each course.

The physics courses have a total workload for the students of about 100 hours, whereas the Medicine courses have about 60 hours and Mathematics 65 hours. The physics courses are well organized and cover almost completely the spectrum of Medical Physics disciplines. On the other hand, the Medicine courses may need a small internal adjustment, such as an increase of Physiology hours and a reduction in the Biochemistry and Clinical Chemistry hours. The arguments of these latter disciplines are very important for very specific sub-fields of Medical Physics, but they can easily be reduced for the "average" medical physics student. As for mathematics a modern computing approach should be encouraged.

3.1 First semester laboratory exercises

Also with reference to what stated in section 3.1, the assessor believes that the laboratory exercise hours in biochemistry-clinical chemistry can be reduced. All the other laboratory exercises are appropriate and necessary.

3.1 Second semester theoretical lectures

During the second semester the theoretical lectures (for a total of about 260 hours) cover all specific aspects of Medical Physics in the following temporal order:

Physics in Medicine
Nuclear Medicine and Radiodiagnosis
Radiation Therapy, Radiation Protection and Non Ionizing Radiation
Nuclear Technology and Environmental Radioactivity

The content of each course is well organized and complete.

3.1 Second semester laboratory exercises

The topics suggested for the laboratory exercises are very well selected and certainly their completion by the students gives them a valuable understanding of what they are expected to perform during the second and third year. An additional emphasis could be given to more modern computer technology applications, eventually with the direct involvement of the Computer Science Department of the University of Athens. In fact, it is worth noting that image manipulation, image analysis, virtual reality and computer assisted diagnosis are going to have a greater and greater importance in the near future in the field of medical physics.

4. The student body

The limited number of students (15 for the first year of the program started in 1999) allows establishing a good relationship with the teachers. In the informal meeting I had with them, I found them highly motivated and very supporting of the course arrangement with very few complaints: heavy workload of the course, not enough time for preparing the exams and, partially, the lack of reference books for some courses. On the other hand, it is recognized that the teachers give handouts of their lessons that are the basis of the exams. No dropout has been reported from previous years. However, no official documents either on dropout or on employment after completing the course was given to the assessor. In response to a specific query students of the second year acknowledged that the first year was sufficient and necessary for the continuation of the course, except for some readjustments to be made in the medicine courses (see also section 3.1).

5. Staff and management of human resources

In general the teaching staff is very well prepared, motivated and integrated with the course aims and finalities. However, the assessor believes that for some courses too many teachers are of detriment of the best organization of the course. This also implies that some coordinators, in some areas in medicine, are not well aware of the entire program. On the other hand, the assessor recognizes that an inter-university course is more difficult to be harmonized and optimized, and he congratulates with the course organizers for the great job that has been done.

6. Facilities

6.1 – Lecture halls

The lecture halls both at GAEC and at the Medical School of Athens University are very appropriate. Modern teaching audiovisuals are available and are used to the benefit of the students.

6.2 – Laboratory exercises facilities

For the first semester the assessor was not able to visit the facility either for the non ionizing radiation lab exercise at the Technical University of Athens and that for the Biochemistry-Clinical chemistry at Evangelismos Hospital. However, for this latter lab, the assessor refers to what already underlined in section 3.1.

The facilities available for the course at GAEC are first class, especially for the possibility by the students of using the Secondary Standard Laboratory instrumentation. To this respect the assessor suggests the use of this facility to be implemented by moving in that location some of the second semester lab exercises. The Biology and Radiobiology exercises are well organized in sequence and I found them quite interesting and appropriate, especially the biological dosimetry. Similarly, the assessor rates very important for the preparation of a qualified medical physics the exercises in radiopharmaceuticals. The ICPMRP course takes a great advantage in using the tremendous research potentiality of the Democritos Center.

As for the more conventional lab exercises of the second semester about Quality Control in Nuclear Medicine, Radiodiagnosis and Radiotherapy, the assessor believes that they somehow suffer by the hospital situation, where space, logistic, age of the instrumentation and timetable could be a problem. The assessor suggests that some of the Quality Control exercises in Nuclear Medicine and Radiodiagnosis could be transferred to the GAEC location, provided that the necessary instrumentation is available. Additionally some experiences should be added on modern computer technologies, more than just the Plato system for treatment planning.

7. Summary of Findings

The assessor is very satisfied with the content of the first year course both for theoretical lectures and laboratory exercises. The course is benefiting a lot by the organization and facilities of GAEC and Democritos Campus. The willingness and the competence of the teaching staff are highly appreciated. The interdisciplinarity and complementarity of topics and teachers a plus. However, the assessor would also like to evidentiate some weaknesses of the course, and indicate some appropriate suggestions for the future:

i) There are too many teachers for some courses, each one contributing to a very small fraction to the formation of the future medical physicist. A more compact teaching body is recommended especially for some courses in Medicine.

ii) Some arguments in the Medicine courses are not well tailored to the class of students (physicists and future medical physicists). In addition the biochemistry program (both theoretical and laboratory exercises) should be reduced.

iii) The facilities used for the traditional laboratory exercises for the second semester at the Hospital are not completely satisfactory. It is suggested to move some of these exercises to GAEC location. In addition more practical experiences on modern computer technologies should be introduced.

iv) The class workload for each semester of the first year is considered rather heavy. An attempt should be made in reducing it, and at the same time in providing more reference books for self–learning by the students.

v) As a final recommendation the assessor strongly recommends to continue running the program, that seems to him very valuable and successful. A possible extension of the program to a 3-year period could be of benefit.

8. Acknowledgments

The assessor wishes to thank all the staff of the IPCMRP course and in particular its coordinator Professor Proukakis for their patience and kindness during his visit.