



# UNIVERSITA' DEGLI STUDI - L'AQUILA

## DIPARTIMENTO DI INFORMATICA

L'Aquila, July 10, 2008

### Review Report of Undergraduate Teaching of Computing at Imperial College (IC)

The review took place on the 13th of June 2008 and consisted of a full day visit to the Department of Computing. During the day, besides meeting the Pro-Rector Professor Julia Buckingham, the review committee met the Head of Department, Prof. Jeff Magee and the Director of studies, Prof. Susan Eisenbach, a selected group of staff members and a selected group of students. The review committee also had a tour of the facilities.

The Computing Department at IC offers two programmes in Computing (BEng and MEng) and a Joint program with the Department of Mathematics in Mathematics and Computing (JMC). In the following I will focus on the two Computing programmes. In the end I will discuss the JMC programmes.

BEng has a three year duration and aims at providing a broad knowledge in the science and engineering of computing. MEng has one year more that allows for further providing a specialisation and a for professional formation through industrial placement.

Both programmes are characterized by a calibrated blend of foundational courses, providing the scientific side of computing including the basics of mathematics and logics, and more application-oriented courses providing the engineering side of computing including extensive experimental and laboratorial activities. The extra fourth year of MEng permits to add specific skills in three different fields that reflect the high level research competencies present in the Department. At the same time these programs also offer a fair degree of freedom in choosing among a representative list of optional courses.

Computing is a relatively recent field characterized by an extremely fast-paced technological evolution. In designing a computing course the key issue to solve is the apparent dichotomy between providing the most updated technological skills as required by the market and providing a long-lasting education that can survive and supersede the technological obsolescence. This issue is clearly reflected and properly addressed in the design of the two courses. They provide a backbone of core courses, whose foundational content does not indulge towards technological fashion, that are complemented by an intense laboratorial programme that covers the most updated technologies.

The educational objectives of the programmes are appropriate and clearly defined as well identified is the way to achieve them. Students have excellent facilities at their disposal and a thorough tutoring support all along the program. Great attention is devoted at providing all the relevant skills requested to a computing professional. Besides the computing knowledge this amounts at facilitating the development of organizational, social and communication abilities.

The assessment methods are differentiated among written papers, assessed coursework and assessed lab programme and, in the final MEng year, an assessed group project.

This allows for a comprehensive assessment of the learning outcomes.

The curricula are well structured and organized. The data about the destinations of recent graduates show that there is a large percentage of students who enter an employment and another fair amount that goes on to further studies. Notably, after one year of graduation, more than 80 per cent of the students is successfully using the acquired knowledge.



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The management of the two courses is performed through the Operations Committee at the Department level and through the Academic committee at the course level. Strategic decisions about the content of the computing programmes are taken at the Department level while management and evolution of the programmes is done by the Academic committee. This structure, together with the set of feedbacks coming from different sources (students, external assessors review, professional societies, external examiners) permits to guarantee an optimal level of quality in the provision and academic standards. The research excellence profile of the Department allows for timely decision on the design and evolution of the computing courses. The representative Academic committee allows for efficiently managing the courses content and their operation.

The JMC programme is co-conducted with the Department of Mathematics and it is a well designed inter-disciplinary course that attracts a good number of students with specific interest in mathematics and computer science. The considerations that I expressed above also apply to JMC with the relevant addendum that this seems a successful case of inter-departmental cooperation. During the discussion with both the staff and the students emerged the awareness of the need to inject in the computing programmes more inter-disciplinary options beyond the traditional ones with the Department of Mathematics. Personally I consider interdisciplinary education as a key disruptive factor in future scientific research. In particular I believe that this need is anticipated in the computing field due to its pervasive nature. It would be therefore interesting to support and favour at the University level experiments in this direction.

My last comment is about internationalization. Notably MEng offers an International programme of study to develop in UK and abroad. Unfortunately very few students choose it. This seems to be a weakness (at least from my biased point of view). On the other side this can be considered as a measure of success since education at IC is probably perceived as optimal. I am sure this is not a problem just connected with the design of the programme rather it is a more general issue that needs to be analyzed from a sociological perspective and possibly scaled up at the university level.

Summarizing I consider the reviewed programmes of excellent quality standards. They are carefully designed and managed and they are supported by an enthusiastic and committed staff. There is margin for improvement as discussed in my report. The top management of the programmes is well aware of it and future initiatives are planned in these directions.

This concludes my report. Should any further comment be necessary, please do not hesitate to contact me.

Yours sincerely

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