F3G4 (PHYSICS WITH COMPUTING) PROGRAMME SPECIFICATION

1. Awarding body/institution: Queen Mary, University of London
2. Teaching institution: Queen Mary, University of London
3. Programme accredited by: Institute of Physics (2000); next visit 2005/06
4. Final Award: BSc
5. Programme title: Physics with Computing
6. UCAS code: F3G4
7. QAA Benchmark Group: Physics, astronomy and astrophysics
8. Criteria for admission: Normally three A-levels with a minimum of 280 points. This must include Physics and Mathematics at grade B.

9. Aims of the programme:

For all programmes which we offer we aim to:

i. teach physics of high quality within an excellent research environment;
ii. recruit students able to benefit from a university education;
iii. provide programmes that enable students with a variety of educational backgrounds to pursue programmes in physics as a single subject as well as in physics combined with other natural and applied sciences;
iv. provide access to such variety of courses, including those from other disciplines, as to enable students to tailor their studies to their own needs and interests;
v. instil in students an understanding of the working of the physical world;
vi. encourage students to develop transferable skills that are applicable to a variety of careers;
vii. provide programmes that prepare students, where appropriate, for a range of professional careers in physics.

viii. provide opportunities for students to appreciate the beauty of physics and to develop a desire for learning.

10. Learning outcomes for the programme:

As with our aims all programmes share a set of common learning outcomes. A student graduating with a BSc should:

i. have acquired a core knowledge of physics, possibly coupled with experience of another pure or applied science;
ii. be able to communicate this knowledge;
iii. have acquired essential skills in the use of computers for word-processing, spreadsheet computing and the acquisition and manipulation of data, in measurement and the analysis of uncertainties of observation, in the use of high-level computer languages, in the art of scientific report-writing and in the oral presentation of technical material;

iv. be able to apply scientific methods to the analysis of problems;

v. have seen and understood the application of core physics to one or two specialised areas of study;

vi. have acquired an understanding of the workings of the physical world;

vii. be able to appreciate the rôle of science in general, and of physics in particular, within a broader range of human cultural activity.

A good BSc graduate should be able to employ the skills (s)he has learned in a variety of occupations, especially those calling for an analytical approach to the solving of problems.

11. Teaching, learning and assessment strategies:

Our programmes are constructed within a modular course structure in which each student takes eight course units (modules) per year. Our overall strategy is to achieve a balance, appropriate to the aims of each course unit, between teaching (lectures; practical laboratory work; small-group tutorials) and learning by students (peer discussion; exercise classes; coursework and essay assignments; independent work in laboratories and computer studies; teach-yourself computer packages and the Internet; videos; textbooks and supplementary reading).

Compulsory tutorials, exercise classes or laboratories, are provided for all core courses: tutorials are used to reinforce students’ knowledge and understanding in conceptually challenging courses, such as those on quantum and statistical physics, whilst exercise classes are used to develop the specific skills needed in courses such as Electric and Magnetic Fields. Two general physics laboratories are used to develop experimental skills, including the acquisition of data and the analysis of uncertainties of observation. In addition students learn to write a scientific account of their experimental observation. Finally, review and experimental projects are used to develop students' investigative skills.

Assessment is by a mixture of continuous assessment and formal written examinations at the end of each year. We use a variety of in-course assessments to enable students to get quick feedback as to their performance. These include weekly coursework (marked and returned on a weekly basis), essay assignments, mid-term tests carried out in a lecture slot, performance in exercise classes and tutorials, laboratory and project reports. These in-course assessments are combined with formal final written examination results and oral examinations (on project reports) to produce the final mark for each course unit. The precise mixture of in-course and final exam marks to give the overall mark varies between different course units and is specified in the detailed course unit description given in the Student Handbook (see below).

12. Programme structure and requirements, levels and courses:

Each programme we offer is made up of a mixture of compulsory core units (C) common to most programmes, a set of units required (R) for a specific programme and suggested (S) units which offer a range of choice to the student depending upon his/her interests and aptitudes. For any Degree Programme entitled Physics with Another Subject, the programme will be split roughly 75:25 between physics and the second subject. All core (C) units in physics will be included in the programme. An important feature of the programme is that every student is required to carry out an individual Independent Project in the final year. We have a detailed three-year plan for each programme and for F3G4 it may be seen at the web address
In addition for each Physics Department course unit (module) there is a detailed description including the syllabus, the recommended textbook and the forms of assessment. This may be accessed via the undergraduate student handbook at

http://www.ph.qmul.ac.uk/ughandbook/courses.htm

Most of the course units are taught in the Department of Physics but there will be suggested courses from the Department of Electronic Engineering whose website is at

http://www.elec.qmul.ac.uk/

13. Quality assurance and enhancement:

Each student enters the Department via the College Induction Process plus a Physics Department Induction. Each student is assigned to a personal tutor who acts throughout the student’s Degree studies to help with choice of modules and with any problems that may affect a student’s studies. Teaching and Learning policy is decided by a Departmental Teaching Committee on which sit all the programme organisers. To assess how well our policy is implemented we have a variety of feedback mechanisms. There is a Student Staff Liaison Committee (SSLC) which meets once per term to consider student concerns and to monitor the results of student questionnaires circulated in each course unit. The Staff Convener of the SSLC sits on the Teaching Committee and reports back student views and suggestions. Each course organiser submits a report on his/her course after the final examination which is considered by the Teaching Committee. Programmes of study are subject to review on an annual basis.

14. Transferable skills and employment possibilities:

Many of our graduates go on to further specialist study of Physics at MSc or PhD level but significant numbers aim at careers that do not directly use their physics training. These employment areas include teaching at secondary or tertiary level, management, finance, IT and journalism. All physics graduates with reasonable Degrees are highly employable because of the skills they gain in their studies. The most important of these skills are numeracy, familiarity with computers and IT, problem-solving skills, ability to carry out measurement and observation and to analyse the results thereof, the ability to write technical reports and the ability to give oral presentations of scientific arguments.

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<th>Person Completing Programme Specification</th>
<th>Dr. R. B. Jones</th>
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<td>Person responsible for management of programme</td>
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<td>Date of completion of programme specification:</td>
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<td>Date of approval by Faculty Board/EB:</td>
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