PROGRAMME SPECIFICATION

1. Awarding body/institution: Queen Mary, University of London

2. Teaching institution (if different from above): Queen Mary, University of London

3. Programme accredited by:

4. Final Award: BSc, MSci

5. Programme title: Nanoscience and Nanotechnology

6. UCAS code: TBD

7. QAA Benchmark Group: TBD

8. Criteria for admission to the programme: Normally three A-levels with a minimum of 280 points. This must include at least two sciences or one science with mathematics.

9. Aims of the programme:

For all programmes which we offer we aim to:

i. teach science 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 background to pursue programme in physics as a single subject, physics combined with other natural and applied sciences, and in sciences which are underpinned by physics;
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, science and engineering;
viii. provide opportunities for students to appreciate the beauty of science 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 from this programme with a BSc should:

i. have acquired a core knowledge of physics and of materials science, coupled with experience of other pure and applied sciences;
ii. be able to communicate this knowledge;
iii. have acquired essential skills in the use of computers for mathematics, word-processing, spreadsheet computing and the acquisition and manipulation of data, in measurement and the analysis 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 science to some specialised areas of study;
vi. have acquired an understanding of the working of the physical world;
vii. be able to appreciate the role of science and engineering, 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.

In addition, an MSci graduate should

viii. be fluent in the language and methods of science;
i. be able to apply core science to the understanding of phenomena in specialised areas of study;
x. be able to plan and execute a small research project;
xi. be able to apply acquired knowledge and skills to the modelling of new problems in nanoscience;
xii. be equipped for a professional career based on nanoscience.

An MSci graduate should be able to enter further training at PhD level and to become a professional scientist. They should in addition be able to enter any number of other careers which use the transferable skills gained in the four year programme of study.

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 other courses. 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 detailed course unit description given in the Student Handbook (see below).

12. Programme structure(s) and requirements, levels and courses

This programme is characterised by its breadth rather than its specialisation. It is designed to allow a student to mix the sciences of Physics, Materials, Chemistry and Biology to understand the interdisciplinary nature of nanoscience. An important feature of the programme is that every student is required to carry out an individual Project in the final year. Details of modules may be found at the web address.

The recommended units are taught by the Department of Physics, Department of Materials, Department of Chemistry and the School of Biological Sciences whose websites may be found at

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

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

http://www.chem.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 Convenor 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.

<table>
<thead>
<tr>
<th>Person Completing Programme Specification</th>
<th>D.J. Dunstan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person responsible for management of programme</td>
<td>D.J. Dunstan</td>
</tr>
<tr>
<td>Date programme specification agreed by Department or teaching and learning committee</td>
<td></td>
</tr>
<tr>
<td>Date of completion of programme specification:</td>
<td>23rd May 2007</td>
</tr>
<tr>
<td>Date of approval by Faculty Board/EB:</td>
<td></td>
</tr>
<tr>
<td>Date of update/amendment:</td>
<td></td>
</tr>
</tbody>
</table>