**PROGRAMME SPECIFICATION**

<table>
<thead>
<tr>
<th>Awarding body/institution:</th>
<th>Queen Mary University of London</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching institution (if different from above):</td>
<td></td>
</tr>
<tr>
<td>Name of the final award and Programme title:</td>
<td>MSc in Dental Materials</td>
</tr>
<tr>
<td>Duration of Study/Period of Registration</td>
<td>1 year</td>
</tr>
<tr>
<td>UCAS code:</td>
<td>J5S9</td>
</tr>
<tr>
<td>QAA Benchmark Group</td>
<td>Materials</td>
</tr>
<tr>
<td>Academic Department/s involved in programme delivery</td>
<td>School of Engineering and Materials Science &amp; Centre for Oral Growth and Development Institute of Dentistry</td>
</tr>
<tr>
<td>If accredited by a professional/statutory body, please give the name, date of last accreditation visit, approximate date of next visit and details of exemptions that will be given to QMUL graduates.</td>
<td>Institute of Materials, Minerals and Mining, on behalf of the Engineering Council. Last accredited in 2009.</td>
</tr>
</tbody>
</table>
Criteria for admission to the programme

Students will be admitted typically with:

IELTS 6.5
BSc/ BEng/ BDS or equivalent at 2i level or above, or 2ii with appropriate work experience

Aims of the programme

The overall aims of the programme are:
- to provide a materials education of a standard recognised to be amongst the highest in UK institutions
- to educate our students in the scientific and mathematical principles underpinning materials science
- to enable all our students to achieve their academic potential by providing a stimulating, friendly and supportive environment
- to offer challenging programmes which provide our graduates with a clear pathway to Chartered Engineering status
- to prepare our graduates with discipline-specific knowledge and transferable skills that will equip them for employment and continued professional development through self-learning.
- provide an understanding of the basic science underlying dental materials for undertaking research in this field
- develop research skills and methods relevant to dental materials
- provide a suitable entry qualification for PhD programmes in Materials, Dental Materials and related areas

Specific aims include:
- analytical, creative, organisational, practical and communication skills,
- problem-recognition and solving abilities
- competence in discipline-specific topics which contribute to the solution of problems applied to materials science
- an appreciation of how theoretical and practical approaches can be synthesized to arrive at optimal solutions
- an understanding of the relationship between their discipline and social, economic and environmental issues and constraints
- the detailed skills needed to undertake a research, development or design project in depth, understanding the technical, financial and time limitations.

This programme aspires to produce the type of highly skilled, motivated, creative and teamwork oriented graduates which the related industry needs.
Learning outcomes for the programme

Students who have successfully completed one of the programmes will:
- have acquired a body of contemporary factual knowledge incorporating the fundamentals of Materials Science and, as appropriate, recognise the application of this to Dental Materials
- have acquired sufficient knowledge of fundamentals of Materials Science principles as applied to realistic materials applications
- have an understanding of the fundamental physical concepts of core technologies so that the limitation of the experimental, mathematical and computational techniques available are fully recognised
- have the ability to analyse and solve problems individually and in groups
- have the ability to communicate knowledge and ideas verbally and in written reports
- have enthusiasm, a spirit of enquiry and a desire for continued learning throughout their careers
- recognise the responsibilities of the professional materials engineer

Knowledge and Understanding

Students will have knowledge and understanding of:
- fundamental scientific and engineering principles in order to be able to work with materials science related problems and projects
- the wider multidisciplinary scientific and engineering context and its underlying principles
- natural and replacement materials found and used in the oral cavity
- the oral cavity in its healthy and diseased state
- research techniques in dental materials
- design and selection of materials to solve specific clinical problems
- international regulatory requirements and governance

Intellectual skills - Students will be able to:
- Apply scientific principles to a range of materials related applications
- reason clearly and critically
- Understand both the application and limitation of mathematical, computational and experimental techniques available to an engineer
- Demonstrate creativity and innovation in the synthesis of solutions
- Critically analyse and assess scientific papers, the basis of the methods of study and the significance of results
- produce a critical evaluation of current research in an area of dental materials and write a dissertation on the subject
- evaluate data and present it coherently in a variety of formats
- advance their knowledge and understanding

Practical skills

Students will:
- Possess general study skills
- Be able to carry out a substantial piece of individual work whose structure and content is largely self-determined
- Be able to work co-operatively within a team
- apply a range of analytical and observational laboratory techniques, safely and competently
- demonstrate originality in tackling and solving problems

Transferable skills

Students will be able to:
- take an investigational approach to problem solving
• quantitatively and qualitatively analyse and assess data
• report information in written and verbal form at a professional level
• exercise initiative
• undertake independent learning required for continual personal development
• develop presentation skills
• manage their time efficiently
• be effective with general IT facilities and information retrieval skills
• develop significant team working skills

Teaching, learning and assessment strategies

General strategies
A wide range of teaching, learning and assessment techniques are adopted. Teaching methods are tailor-made to suit the size of classes, the nature of the subject and the level of study. Each course has a mix of lectures, tutorials, laboratory sessions, industrial visits, workshops, group work, etc.

The individual projects are designed for students to exercise independent thinking, research and problem solving skills. The group projects enhance students’ communication, organisational as well as technical skills.

Assessment strategies vary and are described in detail on the SEMS website for each module. They include end of year examinations, in class tests, written reports and presentations. The assessment operates in accordance with the London University Course-Unit Regulations and established College procedures.

Programme specific strategies
This degree programme is aimed at dental surgeons, materials scientists and engineers wishing to work in the dental support industries, the materials health sector generally and research.

This MSc in Dental Materials is an advanced study programme designed to develop a significantly broad knowledge of the principles underlying the mechanical, physical and chemical properties of dental materials. Furthermore the structural properties of materials both at micro and macro levels are taught at postgraduate level.

In the first Semester, special emphasis is placed on materials – structure property correlations in the context of both the clinical and non clinical aspects.

In the second semester, the theoretical aspects covered in the first semester are reinforced by applications of dental materials employed in Clinical Dentistry. In addition, the underlying principles of materials selection and design, bioactivity, biocompatibility and clinical consideration of materials are discussed in detail. The taught courses are complimented by research projects that are based on both the student’s and staff’s research interests.

In the third semester, the taught courses are complemented by research projects that are based on both the student’s and staff’s research interests.

On completion of the MSc programme, the student shall have a good knowledge of topics related to dental materials and in addition be competent in justifying selection criteria and manipulation instructions for all classes of materials relevant to the practice of dentistry.
The research project will teach students to organise their research, compare and appraise the viability of results for a given project, demonstrate the various functions and skills required of a professional, graduate scientist in the industrial and academic environment and illustrate the experimental procedure for challenging problems.
## Programme structure(s) and requirements, levels and modules

<table>
<thead>
<tr>
<th>Semester A</th>
<th>Semester B</th>
<th>Semester C</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 7008 (7) Dental Materials 1</td>
<td>DIN 7009 (7) Dental Materials 2</td>
<td>MTRM005/ DIN7003/ DIN7155 (7) Materials Research Project</td>
</tr>
<tr>
<td>DIN *** (7) Elements of Oral Biology <em><strong>TBC</strong></em></td>
<td>DIN 7152 (7) Minimally Invasive Dentistry Or DIN 7158 (7) Biomineralisation and Biomimetics</td>
<td>MTRM005/ DIN7003/ DIN7155 (7) Materials</td>
</tr>
<tr>
<td>DENM014 (7) Research Methods and Experimental Techniques in Engineering</td>
<td>DENM009 (7) Medical Ethics, Law and Regulatory Practice in Bioengineering</td>
<td>MTRM005/ DIN7003/ DIN7155 (7) Materials</td>
</tr>
<tr>
<td>MAT211 (5) Surfaces and Interfaces in Dental Materials</td>
<td>MAT312 (5) Science of Biocompatibility</td>
<td>MTRM005/ DIN7003/ DIN7155 (7) Materials</td>
</tr>
</tbody>
</table>

### Notes

The numbers in brackets indicate the academic level of each module, where a typical first year module is delivered at a level 4, whilst a master's module is delivered at level 7.

## Quality assurance mechanism (please include details of: SSLC meetings, student feedback mechanisms, personal tutor arrangements, programme induction, programme review and monitoring.)

### Student-Staff Liaison Committee (SSLC) meetings

The School has three Student-Staff Liaison Committees and students on this programme are fully represented on one of these. The committees meet twice during each semester and each one is made up of the following members:

- Senior Tutor (Chair).
- Directors of the relevant programmes.
- At least one student representing the relevant programmes.
- A member of the School’s administration staff who also acts as secretary

SSLC agendas and minutes are displayed on the Senior Tutor’s notice-board and sent to the Registry. Relevant items on the minutes are referred to the appropriate School committees for consideration and feedback.

### Programme induction
A wide range of activities are incorporated into the induction programme to improve the students' laboratory, communication and IT skills. This includes classes in topics as varied as campus orientation, course registration, networking, using college e-mail facilities and using the School intranet.

Methods for evaluating and improving the quality and standards of teaching and learning

- Module review by means of student feedback questionnaires and course organisers’ reports
- Annual staff appraisal
- Peer observation of teaching
- External examiners’ reports
- Periodic Internal Review by the College involving external panel member
- Periodic Institutional Audit of the College by the Quality Assurance Agency

Committees with responsibility for monitoring and evaluating quality and standards

- Quality Committee
- Discipline Teaching Groups
- Education and Learning Committee
- Student-Staff Liaison Committee
- Subject Examination Boards – meet in September to confirm marks and prizes, and to consider progression and awards
- Degree Examination Boards – meet in October to confirm progression and awards.
- Engineering and Mathematical Sciences Faculty Board
- College Quality Enhancement Committee

Mechanisms for gaining student feedback on the quality of teaching and their learning experience

- Student-Staff Liaison Committee
- Student feedback questionnaire evaluation
- Student forums on the School’s website, including module and programme specific forums as well as ones covering more general topics

Staff development

- Staff appraisal scheme and institutional staff development courses
- All new members of staff to attain the Postgraduate Certificate in Academic Practice.

Employers Links
Please provide details of any links with employers

- Details of advisory panels that include current or potential employers;
- Organisations that regularly employ graduates from this programme and the roles that graduates undertake.
- Student prizes donated by organisations that may offer employment to graduates from this programme.

If there are no links with employers consider the learning outcomes and transferable skills and explain how these might be used to inform employers about the qualities and skills a graduate from this programme might be expected to have.

The school has an active Industrial Liaison Forum (ILF). This forum has a direct impact on the programmes by encouraging employers to sponsor and support the students and to provide real design case studies to engage the students throughout the curriculum. The School is always looking at extending membership of the ILF.
<table>
<thead>
<tr>
<th><strong>Person Completing Programme Specification</strong></th>
<th>Dr. Andy Bushby</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Person responsible for management of programme</strong></td>
<td>Dr. Andy Bushby &amp; Prof. Robert Hill</td>
</tr>
<tr>
<td><strong>Date programme specification agreed by School Education Board</strong></td>
<td>28th Jan 2011</td>
</tr>
<tr>
<td><strong>Date of approval by Faculty Board/SMD Education Board</strong></td>
<td>31st March 2011</td>
</tr>
<tr>
<td><strong>Date of update/amendment</strong></td>
<td>28th Jan 2011</td>
</tr>
</tbody>
</table>