



## Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from  
The University of Sheffield

1	<b>Programme Title</b>	Dental Materials Science
2	<b>Programme Code</b>	DENT25
3	<b>JACS Code</b>	A900
4	<b>Level of Study</b>	Postgraduate
5a	<b>Final Qualification</b>	Master of Science (MSc) 180 credits
5b	<b>QAA FHEQ Level</b>	Masters (MSc)
6	<b>Intermediate Qualification(s)</b>	Postgraduate Diploma in Dental Materials Science, 120 credits. Postgraduate Certificate in Dental Materials Science, 60 credits
7	<b>Teaching Institution (if not Sheffield)</b>	Not applicable
8	<b>Faculty</b>	Medicine, Dentistry & Health
9	<b>Department</b>	School of Clinical Dentistry
10	<b>Other Department(s) involved in teaching the programme</b>	Material Engineering
11	<b>Mode(s) of Attendance</b>	Full-time
12	<b>Duration of the Programme</b>	1 year
13	<b>Accrediting Professional or Statutory Body</b>	None
14	<b>Date of production/revision</b>	2011 / April 2013 / December 2015/ January 2017 / February 2018

### 15. Background to the programme and subject area

Dental Materials are the most widely employed medical devices in clinical use, and they have been subject to rapid development and improvement in recent years. Related to the subject, new and emerging technologies are also having an impact on patient treatment, with some fields subject to rapid transformation as a result. Finally, the highly successful dental materials industry is one of the world's largest and most innovative, bringing new products to the market every year. It is not therefore surprising that clinicians (including clinical tutors) throughout the world require constant education on the subject of dental materials and related technologies, and also the scientific basis for their safe and effective use. In addition, basic scientists who need to know more about the use of materials in dentistry also require postgraduate education (either because they are engaged in dental materials research, or they plan to apply their skills and knowledge in this field in the future). Finally, this education programme will also equip potential PhD students with some of the knowledge and skills required to enter a programme for the award of a higher degree by research. Research is one of the School's key activities. It underpins our teaching and informs the development of clinical excellence. RAE 2014: in the recent research assessment exercise 92% of the Dental School's research was graded as 'world-leading' or 'internationally excellent'. The School was given an 'excellent' (23/24) rating in the last (2001) QAA Subject Review exercise and in a recent independent review of teaching was described as 'an excellent school of international calibre.'

Full details from our prospectus and programme information may be found on the School web site at:  
<http://www.shef.ac.uk/dentalschool/>

## 16. Programme aims

The general aims of the programme are:

1. To provide clinical and scientific graduates with the opportunity to enhance personal academic and scientific skills as part of their career development in dental materials science.
2. To introduce, reinforce and develop the principles of scientific research methodology as applied to dental materials science and related technologies used in the repair, replacement or regeneration of tissues in dentistry.
3. To provide advanced knowledge and foster critical analysis of scientific and clinical aspects of the use of materials and related technologies in dentistry, and further appreciate the benefits of continuing professional education.
4. To build on the student's foundation in the basic sciences in order to increase their understanding of the interaction of the biological environment with materials used in dentistry.

## 17. Programme learning outcomes

### Knowledge and understanding:

<b>K1</b>	Recognise the clinical, technical and scientific rationale for the use of materials and related technologies in dentistry, the principles of scientific method and their application to the study and development of dental materials.
<b>K2</b>	Is aware of the principles of relevant basic and clinical sciences appropriate to gain a complete understanding of materials and related technologies in dentistry.
<b>K3</b>	Has an in-depth knowledge in the subject.
<b>K4</b>	Understand how the use of materials and related technologies in dentistry is affected by medical, social, legal, and demographic factors.
<b>K5</b>	Appreciate the drivers of change and innovation in the field of dental materials science and related technologies including tissue engineering and "regenerative dentistry".
<b>K6</b>	Recognise how scientific knowledge of dental materials and related technologies may be best applied to gain further understanding or develop new approaches to tissue repair in dentistry.
<b>K7</b>	Understand the principles underlying the development of evidence-based use of materials in dentistry.

### Skills and other attributes:

<b>S1</b>	Develop the ability to collate, analyse and assimilate research data to a sufficiently high standard for dissertation and towards the standard required for publication.
<b>S2</b>	Is able to obtain relevant information efficiently, analyse and interpret the literature and present it coherently and effectively.
<b>S3</b>	Has gained transferable skills in communication, presentation, data-handling, the use of information technology and team working, consistent with the academic and research aspects of the course.
<b>S4</b>	Is able to integrate all aspects of dentistry with an understanding of the scientific basis for the development, safe use, and improvement of dental materials and related technologies.

## 18. Teaching, learning and assessment

### Development of the learning outcomes is promoted through the following teaching and learning methods:

The programme is divided into a series of modules, some of which are taught longitudinally.

**Staff-led seminars** provide essential background and theoretical information on the development of dental materials science. Staff use cases to illustrate individual facets of dental materials science and provoke reflective learning (K1-7).

**Student-led seminars:** involve individual students developing topics dental materials science, and obtaining information from the scientific literature and their own experience for study, analysis and then encapsulated verbal presentation to other students and staff to lead and stimulate discussion (K1-7, S1-4).

**Literature review / assignments:** students complete assignments in specific relevant areas these include a critical review of the literature and are undertaken with guidance from a member of academic staff. The assignment must be fully referenced and submitted in word-processed form (S1-4).

**Dissertation:** In discussion with academic staff, each student chooses a project that will culminate in the presentation of a dissertation in oral and report form. This must involve the pursuit of original work based upon an approved protocol which should clearly state the objectives, key references, a broad outline of the methods involved, an estimate of resources required and an estimate of the time involved. The final version of the dissertation must be fully referenced, word-processed and bound (S1-4).

**Independent study:** All of the above teaching and learning methods involve an element of independent study, preparing work for presentation, following up on aspects that become apparent in seminars or practice, and pursuing topics that are relevant to dental materials science or a related health technology with potential for use in dentistry. Students are encouraged to make full use of the opportunities presented by having access to the University Library and electronic databases (K2, 4, 7).

**Lectures:** Students are required attend postgraduate lectures on specific topics organised by both the Dental School and the Department of Materials Science & Engineering (K2, 7). Where helpful or appropriate, students are encouraged to attend other lectures which may be of a more general nature.

**Assessment / feedback** Students provide structured feedback at the end of semesters on the programme and receive feedback on written work.

#### **Opportunities to demonstrate achievement of the learning outcomes are provided through the following assessment methods:**

**Formative assessments:** The monitoring of progress of students is by a process of continuous assessment, which includes the allocation of assignments. Students focused sessions will provide a benchmark of the student's existing abilities and to identify areas of knowledge or skill which might require particular attention. (K1-K7, S1-S4).

(S1-3).

**Summative assessment: The award of the degree will depend upon satisfactory performance and completion of the course modules and completion of the associated written assignments. (K1-K7, S1-S4).**

The final assessments will take place in January and July, and consist of the following components:

- Examinations (S4).
- Oral presentations (S1-3).

#### **19. Reference points**

##### **The learning outcomes have been developed to reflect the following points of reference:**

Scientific, clinical and research interests of staff in the Dental School, Hospital, and Department of Materials Science & Engineering, specifically all those staff in biomaterials and related health technologies research.

The Mission Statement of the University of Sheffield, as presented in the Corporate Plan

<http://www.sheffield.ac.uk/ourplan/>

The Learning and Teaching Strategy of the University of Sheffield <https://www.sheffield.ac.uk/staff/learning-teaching/our-approach/strategy2016-21>

General Dental Council's Life Long Learning Statement <https://www.gdc-uk.org/professionals/cpd> and the curriculum as published by the General Dental Council (<http://www.gdc-uk.org/>) in its document "*The First Five Years – Third Edition*"

The benchmarking statements of the Quality Assurance Agency for Higher Education in England and Wales (<http://www.qaa.ac.uk/AssuringStandardsAndQuality/subject-guidance/Pages/Subject-benchmark-statements.aspx>) with regard to dentistry.

The Quality Assurance Agency framework for higher education qualifications.

#### **20. Programme structure and regulations**

The programme is divided into 8 core modules (Postgraduate Diploma 120 credits) covering the scientific subjects that underpin the subject of dental materials science, plus a research project/dissertation module of 60 credits required for the award of the Masters Degree.

Please refer to the [Programme Regulations](#) and the [General University Regulations](#) for detailed information about the structure of programmes and regulations concerning assessment.

## 21. Student development over the course of study

By structured assignment feedback and development of general learning skills, students thus develop an appreciation of how clinical outcomes are frequently determined by the safe and correct use of dental materials. This is in turn informed by scientific knowledge and evidence.

The research project forms an extremely important component of the degree course since it builds upon and brings together many aspects of the skills and knowledge acquired during the course. Specific modules on research methods including critical review of the literature and medical statistics enable students to build on their existing skills and prepare them to undertake the research module.

## 22. Criteria for admission to the programme

Detailed information regarding admission to the programme is available at [http://www.sheffield.ac.uk/dentalschool/masters/dental\\_materials\\_science](http://www.sheffield.ac.uk/dentalschool/masters/dental_materials_science)

## 23. Additional information

The Dental School in Sheffield was first established in the early 1900s and Sheffield University has been awarding a degree in Dental Surgery since 1922. The current Dental School building was opened in 1992.

On the ground floor of the School you will find our 120-seat lecture theatre which was upgraded in 2007 and is equipped with up-to-date audio visual equipment. There are also six seminar/tutorial rooms, an IT Suite with 20 workstations and an internet café / common room. If you need it, the School has wireless connectivity.

On the second floor of the School there is a 54-unit recently upgraded Clinical Skills Laboratory with a dental chair for demonstrations via a live video link and computers offering computer aided learning packages. In the annexe to the School, we have a newly refurbished 40-unit Dental Technology Laboratory with associated materials processing facilities.

In 2009 the School opened a new wing which houses purpose-built and state of the art research laboratories for cell and tissue culture, microbiology, electron microscopy, histology, histochemistry and immuno-cytochemistry, biochemistry, molecular biology, proteomics and materials science.

The Dental School is connected to the recently redeveloped Charles Clifford Dental Hospital. Completed in 2009, the redevelopment included the upgrading of many areas within the hospital including new clinical facilities.

The various clinical departments are equipped with dental units in both open clinics and small side clinics. Facilities for treatment under inhalation anaesthesia as well as conscious sedation and recovery are available. The Dental Hospital has a well equipped radiography department and we also have our own oral pathology laboratories which provide support services for all clinical areas. A dental production laboratory supports both undergraduate and postgraduate teaching and learning as well as providing National Health Service treatment. All these clinical facilities are used by undergraduate and postgraduate dental students. All students are provided with clinical attire. Changing rooms and canteen facilities are available in the basement of the Dental Hospital.

For further information prospective students are directed to the School web pages at <http://shef.ac.uk/dentalschool/>

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at <http://www.shef.ac.uk/ssid>.