The University Of Sheffield.

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	**Programme Title**	Bio-dental Science and Technology
2	**Programme Code**	DENU23
3	**HECoS Code**	100265 (34%), 100270 (33%) 100343 (33%)
4	**Level of Study**	Undergraduate
5a	**Final Qualification**	BSc
5b	**QAA FHEQ Level**	6
6a	**Intermediate Qualification(s)**	None
6b	**QAA FHEQ Level**	None
7	**Teaching Institution** (if not Sheffield)	Not applicable
8	**Faculty**	Medicine, Dentistry and Health
9	**Department**	School of Clinical Dentistry
10	**Other Departments providing credit bearing modules for the programme**	Not applicable
11	**Mode(s) of Attendance**	Full-time
12	**Duration of the Programme**	3 years
13	**Accrediting Professional or Statutory Body**	None
14	**Date of production/revision**	November 2021, February 2023

15. Background to the programme and subject area

The School of Clinical Dentistry has considerable expertise in the basic and applied sciences underpinning clinical dentistry. This spans diverse fields including, but not restricted to, anatomy, oral microbiology, cell biology, biochemistry, physiology, tissue engineering, medical sociology and dental materials; the School conducts world-class basic and translational research in all of these areas (as evidenced by REF 2008 and 2014). Our strength in these disciplines allows us to offer a contemporary research-led programme in subject areas that are at the forefront of healthcare research. Our links with industrial and healthcare collaborators allows us to offer work placements in the third year. The programme offers all of the attributes of the Sheffield Graduate and thus enables graduates to compete for non-subject specific graduate jobs. Graduates will have also gained skills and knowledge in the science of oral health which has application in translation research in industry and the NHS. Graduates will be well placed to continue into postgraduate training in healthcare and other disciplines or research in emerging areas of sociology of health care, bioactive materials, basic and applied health research, advanced manufacturing and virtual reality simulation. For those who subsequently embark on clinical dental training, this degree provides an excellent foundation to subsequently pursue an academic career, helping to address the shortage of clinical academics.

https://www.sheffield.ac.uk/dentalschool

16. Programme aims

The Bio-dental Science and Technology programme at Sheffield aims to provide students with:

1. Knowledge and understanding of the structure, function, development and maintenance of the oral and dental tissues.

2. Opportunities to participate in innovative science including research about the molecular and cellular processes underlying maintenance of healthy and diseased tissues and how to repair them.

3. An option for an external placement to learn how science is exploited to provide commercial healthcare solutions.

4. Skills to understand how society and healthcare solutions interact.

5. Skills in technology that are applicable to employment.

6. Opportunities to engage with the local community and improve their understanding of science and technology as it affects the health of the mouth.

17. Programme learning outcomes

Knowledge and understanding:	
K1	recall the structure of oral and dental tissues and explain how this relates to disease susceptibility.
K2	describe the molecular basis of selected disease processes and explain how these can be therapeutically influenced.
K3	explain the pathogenesis of diseases of the head and neck and outline the biological basis of interventions.
K4	describe the composition of traditional and bioactive dental materials and illustrate their clinical impact.
K5	describe how the needs and views of Society affect health care and the technological solutions offered.

Skills and other attributes:	
S1	identify anatomical structures relevant to bio-dental science from subcellular to surface anatomical scales.
S2	undertake laboratory and placement procedures safely and effectively.
S3	demonstrate teamwork skills and reflect on both team and individual performance.
S4	identify and appraise literature, including the use of digital resources.
S5	design, execute, critique and report upon laboratory research or workplace-based investigation.
S6	present scientific concepts to specialist and lay audiences through a range of media.

18. Teaching, learning and assessment

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

The learning and teaching approaches are mapped below and details of these are given in the module details form.

Lectures
The School provides an extensive series of lectures in the subjects of Bio-dental Science and Technology within its well-evaluated Bachelor of Dental Surgery (BDS) programme. The programme will use a selected number of these in both Years 1 and 2. Lectures from taught postgraduate programmes are used within modules in 3rd BSc.

Seminars & Flipped Classroom activities
Small group learning will be used to enable students to discuss their learning; compare problems and share resources. These are used to support learning in anatomy, tooth morphology, biochemistry and will be developed to underpin research-based themes in year 2 and year 3. Flipped classroom approaches will be used to give BSc students flexibility in their work whilst being supported by direct staff contact in seminars.

Laboratory classes
These classes can be subdivided into (a) those where students are doing a task to improve their knowledge or (b) those designed to develop a skill.

a. These include gross anatomy dissection, histology and pathology classes where students explore structures to develop an understanding of spatial relationships and ability to recognise and discriminate structures.

b. Classes will also be taken in biological and materials sciences so that students can be guided to gain new practical skills, a selection of which will be needed for their individual research-informed placement in year 3.

Individual projects
A significant workplace research-informed placement in year 3 is essential within this programme to enable students to develop deep understanding and knowledge of their chosen subject area and hone their research and employability skills. It will also encourage students to manage time and resources and develop resilience.

Group work
Students will do group work for two activities in year 2. This work will develop subject knowledge, teamwork, developing a research question and critical appraisal to form a base for a successful placement in year 3.

Outreach activities
Students will engage with other student cohorts throughout their studies. There will be opportunities to engage extensively in various specialist threads, which in some case such as medical sociology, will enable students to work with members of the public to learn about their perceptions of dentistry.

The year 3 project has been framed as workplace learning to allow students to engage with groups either within or outside the University to learn in an authentic environment.

Capstone module
DEN330 is an integrative module which will require students to integrate their learning from preceding modules. This module will require students to apply both knowledge and skills from the design of the project through its delivery and the compilation of a report. The module is presented as a placement to highlight to students that problem solving, finding supporting evidence and report writing are employability skills which may be brought to bear on a topic within or without the School. Placements outside the University will be governed in accordance with the University's Student Placement Policy and Guidance.

Learning and teaching approaches									**Assessment methods**			
Learning Outcome	**Lectures**	**Seminars**	**Online learning**	**Laboratory classes**	**Individual project**	**Group project**	**Outreach activities**		**Written work**	**Laboratory or project reports**	**Structured examinations**	**Oral or poster presentation**
K1	12	3		1							12	
K2	1	3	2	1	2				2		12	
K3	1	3	1	2	3				2		12	
K4		3	2	3							2	23
K5	123	3			3		3			3	13	23

S1	1			1		2					12	
S2				13	3	2	3			123	3	32
S3				13	3	2				23		2
S4	3	3		1	23	2	3		2	13	13	32
S5	3	3		13	3	2	3			123	3	
S6		23	3		13		3			13		23

In the table above the numbers indicates the Level in which the activities occur.

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

The assessment mapping is outlined above and details of the individual assessments are given in the module details on SITS. However, some further insight into the planning process is summarised below.

Written work
The essay for DEN223 is a format currently used successfully in the BDS programme. Students complete an evidence-based essay which is assessed against a rubric which is discipline-independent. This will allow students to choose their topic based on their interests. This approach is repeated in DEN31014 when there will be an increased expectation of critical appraisal of literature using techniques taught in the module (S4).

Laboratory or project reports
Laboratory reports are assessed in all years of the programme to appraise skill in documenting work (S5) and to record that reflection (S3) has taken place. We are aware that reflection is notoriously hard to assess and models of reflection will be introduced to students to help them learn and adopt a process. We have found that students engage more with practical work both in the laboratory and in study time if they are aware that the outcomes and analysis will be assessed.

Project reports in years 2 and 3 acknowledge that documenting outcomes is an important skill for employability (S4 to S6). Across the programme students will use a range of methods, including video, infographic, research poster and traditional written reports and essays to do this.

Oral or poster presentation
Presentation skills in face-to-face and poster/summary formats supplement laboratory and project reports. The dental materials presentation is an important assessment in the confluence of knowledge of materials (K4) and their safe and ethical use (K5) based on strong evidence (S4).

Structured examinations
Knowledge outcomes are assessed across methods although there is dominance of structured examinations at year 1 using proven techniques. Importantly these assessments use ‘spotters’ to test anatomical and histological knowledge (K1, K3, S1).

A structured examination in the theoretical aspect of laboratory work (S2) in year 3 complements the hands-on sessions to assess understanding of the rationale of specific techniques.

Capstone assessment
The assessment of the DEN330 placement is important as it must be done in such a way as to be generic, fair and discriminate between students’ strengths. We believe that the range of assessment tasks allow this to be done and the marking criteria are based upon those in the School.

19. Reference points

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

The Sheffield Graduate.

QAA Subject Benchmark Statement: Biomedical Sciences, Graduate and key transferable skills.

QAA Subject Benchmark Statement: Biomedical Sciences, Core knowledge, understanding and skills.

Association for Dental Education in Europe (ADEE) Draft Curriculum in the Biomedical Sciences for Dental Programmes – August 2016.

The University Learning and Teaching Strategy 2016-2021.

The FMDH L&T Action Plan.

The School of Clinical Dentistry Learning and Teaching Strategy.

The School of Clinical Dentistry Research Strategy.

20. Programme structure and regulations

Throughout the 3 years the programme comprises 100% core units. This approach enables clear planning of the Programme Learning Outcomes to be achieved, with a coherent path of academic development maintained, and assessed throughout the programme. However, in both years 2 and 3 students will be able to choose research-informed learning to reflect their interests. The material will be based on the School's research themes which currently include: Mechanisms of health and disease and Transforming oral health. Specific subject pathways and modules are not utilised to allow flexibility within the School's changing research clusters.

The final year research-informed placement may take place within a research theme in the School or as an external work placement and the School will assist students in obtaining a high quality position that provides a valuable, authentic learning environment. Placements will be varied and could include, for example, advanced manufacturing; drug development, computational biology, non-clinical work in a healthcare environment, attachment to a public health team or work within a dental materials manufacturer.

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available on-line at http://www.sheffield.ac.uk/calendar/.

21. Student development over the course of study

The programme has been designed to use a range of teaching and assessment methods to help students attain both the Programme Learning Outcomes and the Sheffield Graduate Attributes. The structure is also intended to help development of students from experiencing teacher-led modules in Level 1 through to being expected to be relatively independent learners in Semester 2 of year 3. This development will be facilitated by including flipped learning in years 1 and 2 and student-designed laboratory work in year 2. Throughout the programme timetabled sessions with tutors are included to provide support and formative feedback.

22. Criteria for admission to the programme

ABB at A-level, two of which must be from Chemistry, Maths, Biology, Physics, Further Maths and Human Biology. Please note that we do not accept General Studies at A-level. Additional completion of the Extended Project Qualification in a relevant subject area may also be considered. Note that Biology with Human Biology is not acceptable in combination. Students offering Maths and Further Maths must also have an additional Science A2 from the list. We will also consider applicants who offer Chemistry with Psychology or Chemistry with Geography as the two science A levels.

23. Additional information

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.