



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	Reproductive and Developmental Medicine
2	Programme Code	HMCT02, HMCT03, HMCT04
3	JACS Code	C140, C142
4	Level of Study	Postgraduate
5a	Final Qualification	Master of Science (MSc)
5b	QAA FHEQ Level	7
6a	Intermediate Qualification(s)	Postgraduate Diploma, Postgraduate Certificate
6b	QAA FHEQ Level	7
7	Teaching Institution (if not Sheffield)	Not applicable
8	Faculty	Medicine, Dentistry and Health
9	Department	Human Metabolism
10	Other Departments involved in teaching the programme	Assisted Conception Unit (STH) Medical school departments
11	Mode(s) of Attendance	Full-time
12	Duration of the Programme	12 months
13	Accrediting Professional or Statutory Body	Not applicable
14	Date of production/revision	April 2013

15. Background to the programme and subject area

Reproductive and developmental medicine is a wide-ranging discipline concerned with the biological, veterinary, medical and social problems associated with fertility, pregnancy, prenatal development and parturition. Understanding the science behind these reproductive processes is key to diagnosing and developing effective fertility treatments in humans and other animals. Our MSc course has been designed to cover a breadth of reproductive processes from the genesis of sperm and eggs through to fetal development and labour. The course is structured to provide general as well as subject-specific scientific training in these topics, and to provide clinical and social perspectives in the treatment of infertility.

The course combines the clinical and research strengths within the Academic Unit of Reproductive and Developmental Medicine (AURDM), with contributions from other science departments at the University and the Sheffield Teaching Hospitals NHS Foundation Trust. In the first half of the course, students study a range of modules taught by leading scientists, clinicians, embryologists and other specialists allied to reproductive medicine. From the outset, they are introduced to the fundamentals of reproductive science that underpins the clinical aspects of infertility. Teaching is delivered through lectures, seminars, laboratory practicals, small group discussions and tutorials. Students are also given the opportunity to visit an assisted conception unit and observe various techniques such as *in vitro* fertilisation (IVF), intra-cytoplasmic sperm injection (ICSI) and embryo transfer (ET). During the second half of the course, students undertake a laboratory-based research project where they develop scientific skills and a depth of knowledge in a chosen topic.

Assisted reproductive technologies such as IVF and ICSI are major achievements in reproductive medicine and now over 2% of offspring in the UK are conceived this way. This has opened up a new branch in the health sector that mainly deals with helping couples to conceive. Consequently many students use this course as a stepping-stone towards a career in clinical embryology, andrology or a medical specialisation in reproductive health. The scientific basis of this course also provides an ideal platform for those wishing to go into research by pursuing a PhD in reproductive science.

16. Programme aims

1. To provide an integrated training in reproductive and developmental medicine suitable for graduate students from a range of backgrounds and disciplines.
2. To provide students with a firm theoretical background and practical skills and knowledge in fundamental areas of reproductive and developmental medicine.
3. To equip students with a comprehensive knowledge of the current approaches and technologies used to treat both men and women suffering from fertility issues.
4. To develop an appreciation of the basic legal and ethical principles involved in human reproductive biology and medicine and their role in the regulation of treatment and research.
5. To train scientists and clinicians to be able to design, perform, interpret and critically analyse experiments that will help to elucidate the physiology of normal and pathological processes in reproductive and developmental medicine.
6. To provide stimulating and enjoyable teaching that is informed and invigorated by the research and scholarship of the staff.
7. To prepare students for further postgraduate work and/or a professional career in reproductive and developmental medicine or other areas of biomedical research through transferable skills.
8. To foster a commitment to continuing professional development and lifelong learning.

17. Programme learning outcomes

Knowledge and understanding:

Candidates for MSc, PG Diploma and PG Certificate will be able to:

K1	Demonstrate a critical understanding of how gonads develop and function to synthesise and respond to steroids and growth factors and how they give rise to viable gametes in males and females.
K2	Demonstrate a comprehensive knowledge of the pivotal physiological events from pre-fertilisation through to implantation and embryonic development.
K3	Demonstrate a comprehensive knowledge of the biochemistry, physiology and pathology of human pregnancy and parturition.
K4	Demonstrate a critical understanding of basic reproductive endocrinology, the underlying endocrine-based problems associated with infertility, and the current clinical approaches used to treat infertility in humans.
K5	Critically assess the basic legal and ethical principles relevant to reproductive biology and medicine including the role ethics committees and research governance plays in overseeing current research using human subjects and embryonic tissues.
K6	Critically evaluate the scientific literature to identify gaps in scientific understanding, formulate testable hypotheses and develop strategic directions for research.

In addition, candidates for MSc and PG Diploma will be able to:

K7	Demonstrate a detailed and in-depth knowledge of a contemporary and/or controversial issue in reproductive and developmental medicine.
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In addition, candidates for MSc will be able to:

K8	Demonstrate a critical understanding of hypothesis-driven research including experimental design, execution of experiments and analysis of outcomes.
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Skills and other attributes:

Candidates for MSc, PG Diploma and PG Certificate will be able to:

S1	Explain the physiological processes that underpin normal mammalian reproduction and conversely the different situations that can compromise these processes.
S2	Explain the scientific and practical bases behind the different assisted reproduction techniques currently used in reproductive medicine.

S3	Design rational research strategies to solve scientific problems through a logically organised set of clearly defined hypothesis-testing steps.
S4	Prepare the necessary paperwork for the ethics and governance of a research project as defined by the NHS National Research Ethics Service.
S5	Present information orally and in writing to peers in the scientific world and to the general public.
<i>In addition, candidates for MSc and PG Diploma will be able to:</i>	
S6	Retrieve, critically evaluate, synthesise and summarise published scientific information.
<i>In addition, candidates for MSc will be able to:</i>	
S7	Perform a range of general laboratory techniques with aptitude, in particular those that are relevant, but not limited to, reproductive science.
S8	Have a strong ability to critically analyse and interpret experimental data.
S9	Work independently and safely, whilst contributing effectively as part of a research team.
S10	Manage time effectively by demonstrating an ability to carry out a research project through to completion.

18. Teaching, learning and assessment

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

For each of the 15-credit taught modules, the primary mode of teaching will be through lectures and seminars held within the Academic Unit of Reproductive and Developmental Medicine. These will mainly be delivered by scientists or practising clinicians, each being specialist in the appropriate topic. State-of-the-art and 'special-interest' seminars will be interspersed throughout the course to promote reflection and provide current information on topical subjects in reproduction. A significant amount of self-directed, independent study using library and web-based resources will also be essential for the student to develop a deeper level of understanding. Experimental classes will be introduced early in the course, where students will have the opportunity to learn fundamental laboratory techniques, and be challenged to develop the skills necessary for culturing ovarian follicles and implementing sperm-oocyte binding assays in model organisms. Students will also be guided through current reproductive technologies in humans from taught sessions delivered by the Assisted Conception Unit. Informal tutorials and small discussion groups will be used to encourage students to actively participate and debate various aspects addressed in the formal teaching. During the second half of the course, project supervisors and other lab-members will mainly teach students in a one-on-one manner. As students gain experience and confidence, they will be encouraged to organise their time, plan their experiments and work more independently.

LO	Teaching and learning						Assessment method						
	Lectures / seminars	Tutorials	Practical laboratory sessions	Supervised clinical activity / fieldwork	Problem solving classes	Research project	Written exam	Oral presentation / debate	Literature review / meta-analysis	Poster presentation	Open book course work / report	Research dissertation	Viva voce (Masters only)
K1	X	X	X			X	X	X	X	X	X	X	X
K2	X	X	X	X		X	X	X		X	X	X	X
K3	X	X				X	X	X		X	X	X	X
K4	X	X	X	X		X	X		X	X	X	X	X
K5	X	X		X	X	X		X	X	X	X	X	X
K6	X	X			X	X		X	X	X	X	X	X
K7	X	X		X	X	X			X	X	X	X	X
K8	X	X	X		X	X				X	X	X	X
S1	X	X	X	X	X	X	X	X	X	X	X	X	X

S2	X	X	X	X	X	X	X	X	X	X	X	X	X
S3	X	X	X			X		X	X	X	X	X	X
S4	X	X								X			X
S5		X	X		X	X	X	X	X	X	X	X	X
S6	X	X			X	X			X	X	X	X	X
S7			X	X		X			X	X	X	X	X
S8			X		X	X			X	X	X	X	X
S9			X		X	X					X	X	X
S10			X			X					X	X	X

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

A range of different assessment methods, in the form of written course work, presentations (poster and oral) and formal examinations will be used. The variety of formats will account for the various learning outcomes, prevent excessive assessment repetition and challenge the students in multiple ways. The two examination papers will consist of a series of short answer and multiple-choice questions relevant to two of the 15-credit taught units. The aim of this assessment is to encourage students to bring the course material together, mainly by recalling factual knowledge and fundamental concepts (K1-K4) and also by applying scientific principles relevant to reproductive medicine (S1,2 and 5). The actual weighting for the formal examinations will vary by unit, for instance the first examination will contribute 60% of the assessment for the *Fertilization, Implantation and Embryology*. A separate 2-hour examination will contribute 60% of the *Pregnancy and Parturition* unit. The main assessment in the *Gonads to Gametes* unit will consist of a task of writing up a practical experiment, which will assess critical knowledge developed in the taught component, promote interpretation and encourage an aptitude towards writing succinctly and scientifically (relevant to all learning outcomes). A major assessed component of the *Reproductive Endocrinology and Infertility* unit will include a literature review project, where groups of students will be advised on how to perform or analyse a meta-analysis on a chosen topic. This will equip the students with a unique set of skills during the assessment, which will also encourage them to effectively contribute both individually and part of a team (especially relevant to S3 and 5). The latter will also be assessed in the *Scientific Information and Research Design* unit, where groups of students will critically compare and present conflicting scientific research articles, forcing them to consider scientific analyses in depth. The research project unit is assessed in the form of a written dissertation (70%), a poster presentation (10%) and an oral examination (viva) of 25-30 minutes (20%), with two assessors. One assessor will be external, and the other internal (combined assessments in the research project unit is relevant to all learning outcomes). Candidates undertaking the PG Diploma will take a library project in place of the research project, which will be assessed in the form of a written essay (80%) and an oral presentation (20%). The students will be given plagiarism tutorials during the few week of the course to inform them of the University's attitude to plagiarism, and all assignments are screened with plagiarism software (Turnitin). In all cases the learning outcomes from each module will be carefully matched to the method of assessment, and all assessments will be double marked.

19. Reference points

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

- The framework for higher education qualifications in England, Wales and Northern Ireland
- The QAA guide to Masters degree characteristics
- The University of Sheffield Learning, Teaching and Assessment Strategy 2011-16
- The University of Sheffield Strategic Plan 2010-15
- Faculty of Medicine, Dentistry and Health Learning and Teaching Strategy 2009-14
- Feedback from lecturers, students and external examiners on other MSc courses in the Medical School and other relevant MSc courses in the UK (MSc in Reproductive and Developmental Biology, Imperial College London and MSc in Reproduction and Development, University of Bristol)
- The Human Fertilisation and Embryology Acts (HFEA)

- The International Federation of Fertility Societies (IFFS) document
- National Institute for Clinical Health and Excellence (NICE) guidelines on IVF and fertility

20. Programme structure and regulations

The following 15 credit modules will be taught throughout the first semester:

1. Scientific information and research design (15)
2. Gonads to gametes: fundamentals of reproduction (15)
3. Fertilisation, implantation and embryology (15)
4. Fetal development, pregnancy and parturition (15)
5. Reproductive endocrinology and infertility (15)
6. Law, ethics and policy in reproductive medicine (15)

Postgraduate Certificate students only will need to pass 4 of the 15-credit modules (60 credits).

Masters students will need to complete all 6 of the 15-credit taught modules and a 90-credit research project in the second semester (180 credits). Students completing the taught modules will have the option to substitute the 90-credit research project for a 30-credit library-based project and be awarded a Postgraduate Diploma in Reproductive and Developmental Medicine (120 credits).

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.shef.ac.uk/govern/calendar/regs.html>.

21. Student development over the course of study

The programme has been designed so that students progressively achieve more advanced levels of learning and practice. Initially, there will be an emphasis on the science that underpins all aspects of reproduction and development and also the scientific principles of basic research - the latter being introduced in the scientific information and research design module (module 1). The foundation science (presented especially in modules 2-4 above) will be built on as students progress to more subject-specialist modules (modules 4-5) and will allow them apply this knowledge in context with clinical practices; for instance, understanding the physiology of conception, pregnancy and parturition will provide a platform for students to achieve more advanced understanding of assisted reproduction and aspects of obstetrics and gynaecology. Having acquired this breadth of knowledge, the students will then be well placed to reflect on the societal considerations of all aspects of reproduction and development through the laws and ethics module (module 6). The research project module lasts for 25 weeks, allowing time for students to develop a depth of knowledge in their chosen topic. During this time the students will be supported by one-to-one supervision.

Students will also have the opportunity to learn and develop personally by participating in 'Discovery Night', held annually as part of Science Week at the University. The Academic Unit of Reproductive and Developmental Medicine actively participates in this event by recruiting volunteers to communicate their work to the general public. This is a priority theme of the Faculty (MDH) and University Learning and Teaching strategies.

22. Criteria for admission to the programme

Detailed information regarding admission to programmes is available from the University's On-Line Prospectus at <http://www.shef.ac.uk/courses/>.

This course is suitable for graduates who have a degree in life sciences, veterinary science or medicine, but will not be limited to these subjects; candidates from other specialist backgrounds such as clinical embryology, nursing or law may be considered depending on their proven potential, experience and motivation to undertake this course. It will also be suitable for MBChB students wishing to intercalate. Candidates will normally have a 2:1 degree or equivalent and those with a 2:2 will be considered in exceptional circumstances (eg previous laboratory or research experience). Candidates will also overall IELTS grade of 6.5 with a minimum of 6.0 in Reading, 6.0 in Writing, 6.5 in Listening and 6.0 in Speaking, or equivalent. This level meets the English language criteria set by the MSc course in Molecular Medicine, for which we will be sharing a module.

23. Additional information

Sheffield combines the advantages of a top quality University, an outstanding Student's Union, a large city and a pleasant location adjacent to the Peak District National Park.

Information on research and clinical activities in Reproductive and Developmental Medicine in Sheffield can be found by browsing the following websites:

<http://www.shef.ac.uk/humanmetabolism/units/rdm>

<http://www.jessopfertility.org.uk/>

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>.