

A	NATURE OF THE AWARD	
1	Programme Title	MSc in Clinical Genomics
2	Final award	MSc - level 7
3	Intermediate awards	Postgraduate diploma
4	Awarding institution/body	St. George's Hospital Medical School, a constituent College of the University of London
5	Teaching institution	St. George's, University of London St. George's Healthcare NHS Trust All Wales Medical Genetics Service, University Hospital of Wales, Cardiff West Midlands Regional Genetics Service, Birmingham
6	Programme accredited by	St. George's, University of London
7	UCAS/JACS code	N/A
8	QAA benchmark statements	N/A
9	Date specification produced	12 July 2016, updated August 2019, updated December 2021

B	FEATURES OF THE PROGRAMME	
1	Mode of study	Part time
2	Usual length of programme	24 months (part time)
3	Other features of the programme	Closely aligned with clinical professional development Experiential learning Reflective practice in clinical genetics Personal & professional portfolio production Research project attachment with Genomics England

C	EDUCATIONAL AIMS OF THE PROGRAMME	
	To gain the knowledge, skills and attitude to be an effective practitioner in the interpretation and communication of molecular and cytogenetic results.	

To promote reflective practice, scholarship and professional development in Medical Genetics. To develop translational skills enabling engagement with and critical evaluation of current research in genomic medicine.

D	LEARNING OUTCOMES OF THE PROGRAMME	
	<i>Advanced knowledge and understanding of:</i>	<i>Related teaching and learning methods and strategies</i>
1	The molecular principles behind a range of cytogenetic and molecular techniques in medical genomics and determination of which investigation is applicable to a given clinical scenario.	Online programme of teaching with interactive webinars, laboratory placements, practical workshops, application of knowledge in assessment activities, online and self-directed study.
2		
3		<i>Assessment</i> Oral presentation on the development of a next generation sequencing panel. Online assessment of knowledge of molecular genetic and cytogenetic techniques. Critical essays demonstrating high level understanding of modern genomic technologies.
4		

	<i>Cognitive skills, the ability to:</i>	<i>Related teaching and learning methods and strategies</i>
1	Interpret a genetic variant within a defined clinical context and design a clinical management plan based on that variant interpretation.	Lectures, laboratory placements, practical workshops, through clinical supervision meetings and reflective practice, application of knowledge in assessment activities, online and self-directed study.
2	Critically evaluate the ethical issues surrounding consent for genetic testing with an understanding and explanation of incidental findings.	
3	Critically evaluate the development, application and impact of the use of “omics” in healthcare	<i>Assessment</i> (For first outcome in this section) Written assignment presenting a detailed analysis of the methodology used to interpret a genetic variant.
4		

5		<p><i>(For second outcome in this section)</i> Assessment of communication skills through role play.</p> <p><i>(for third outcome in this section)</i> Written assignment showing understanding and the ability to clearly communicate information about genomic technology.</p>
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	<i>Practical skills: the ability to</i>	<i>Related teaching and learning methods and strategies</i>
1	Communicate complex genetic data to patients/families effectively and sensitively.	Workshops and role play, through daily clinical practice, through clinical supervision meetings, application of knowledge in assessment activities, online and self-directed study.
2		
3		<i>Assessment</i> Development of resource material for patients and/or other professionals. Assessment of communication skills through role play.
4		
5		

	<i>Transferable skills: the ability to</i>	<i>Related teaching and learning methods and strategies</i>
1	Assemble a portfolio that demonstrates learning and progression in the application of genetic technologies, the interpretation of genomic data and the communication of complex genetic information to patients.	Self-directed study and analysis; meetings with supervisors; portfolio development
2	Propose and justify approaches to continuing professional development.	
3	Design, plan and undertake a research project to test a hypothesis and/or critically evaluate current research in a specific area of genomic medicine.	<i>Assessment</i> Portfolio production comprising interpretation of case-based variant evaluations, case study; workplace-based assessments of communication complex genetic data and discussing difficult ethical issues Assessment
4	Communicate complex information colleagues clearly.	

5		Project dissertation and oral presentation
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E	Programme structure and features
<p>All candidates for the programme must have successfully completed the PGCert Interpretation and Clinical Application of Genomic Data (ICAG). This comprises four compulsory 15-credit, level 7 modules (given below). Students must also complete a compulsory 60 credit research projects and a further 60 credits via elective modules</p> <p>Compulsory modules are:</p> <ol style="list-style-type: none"> 1. Understanding Genetic Technologies (15 credits) 2. Clinical Interpretation of Genomic Data (15 credits) 3. Communication of Genetic Information and Data (15 credits) 4. Personal and Professional Development Portfolio (15 credits) 5. Research Project (60 credits) <p>Elective modules are:</p> <ol style="list-style-type: none"> 6. Omics techniques; their application to genomic medicine (15 credits) 7. Molecular pathology of cancer and application in cancer diagnosis, screening and treatment (15 credits) 8. Application of genomics in infectious disease (15 credits) 9. Pharmacogenomics and stratified healthcare (15 credits) 10. Bioinformatics, interpretation and data quality assurance in genome analysis (15 credits) 11. Ethical, legal and social issues in applied genomics (15 credits) 12. Cardiovascular genetics and genomics (15 credits) 13. Teaching, learning and assessment in healthcare and science education (15 credits) 14. Advanced Bioinformatics (15 credits) <p>The normal duration of the course is two years (part time).</p> <p>The PGDip is comprised of just the PGCert ICAG and a research project.</p> <p>Students are permitted to complete elective modules at any point during the 2 years but are encouraged to complete them in year 1. The research project is undertaken in year 2.</p>	
<p>'The description of the structure of the programme, including the lists of modules, is indicative and should not be regarded as full and definitive. For up-to-date information, see the course handbook'.</p>	
<p>Programme reference points – the following reference points were used in the preparation of this specification:</p>	

F	General teaching and learning strategies
<p>The aim of the MSc Clinical Genomics is to develop the student as a self-reliant and autonomous learner, capable of independent and novel thinking and having developed the skills to enable them to apply their learning to clinical practice. These objectives will be achieved through a teaching scheme delivered through three key domains: knowledge, skills and attitudes. The acquisition of knowledge will be achieved through online and face-to-face teaching sessions/workshops and self-directed learning through online and library resources. A secure knowledge base will then provide a platform to develop the skills of data interpretation in the context of clinical phenotyping. This will primarily be achieved through engagement at workshop sessions, assignments and portfolio development. The third domain, attitude, emphasises the need for the clinician to develop the skills to effectively communicate complex genomic data and discuss ethical considerations such as the identification of incidental findings.</p>	

G	Assessment
<p>Assessment is integral to the continuous process of learning and development and holds a central role in the student's overall learning experience. In designing the programme's assessment strategy, consideration has been given to the contribution of assessment to student learning, with the aim of exposing students to a balanced range of assessment tasks which have personal relevance to the student and to their field of professional practice. Validity has been addressed by designing assessments that are well-aligned with the module learning outcomes. To ensure that these are focused explicitly on the stated learning outcomes the assessment tasks have been mapped against the learning outcomes.</p> <p>Reliability is addressed through explicit assessment criteria, internal moderation procedures, external examiner review and the SGUL quality assurance and enhancement processes.</p> <p>The assessment philosophy recognises that students have varying strengths and weaknesses in differing modes of assessment. A diverse range of assessments has been developed across the programme to optimise student performance and meet a number of differing preferred learning styles. This will enable students to demonstrate their abilities without being compromised by a narrow range of assessments and will address the DDA requirements for disabled students. Formative assessments will be employed to enable students to learn from feedback and to enhance preparation for the summative assessments.</p> <p>Assessment formats employed are: Oral presentation; online assessment of knowledge; written assignment critically evaluating interpretation methods employed; development of patient/clinician resource material; and a dissertation.</p>	

H	Support for students and their learning
<p><u>Educational Supervisors</u></p> <p>Students will be allocated an educational supervisor as part of their clinical training at their host hospital. The educational supervisor will have attended the ASET workshop or equivalent at St George's or their local Trust where they will be trained to meet all seven domains of the GMC framework for the Professional Development and of Postgraduate Medical Supervisors. The student will meet the educational supervisor every four months to:</p> <ul style="list-style-type: none"> • Discuss participation in the programme, including necessary attendance • Reflect on his/her learning, how it is being applied to clinical practice and to consider implementing changes to improve his/her learning and practice • Feedback from on his/her progress in the course <p>The supervisor will also give advice on assignment preparation including facilitating access to expert guidance if appropriate. The supervisor will also provide pastoral support, referring to the pastoral lead if required.</p> <p><u>Laboratory Supervisors</u></p> <p>Laboratory supervisors will help the students to arrange the laboratory attachment and will ensure that laboratory staff are aware of the student's attendance and that the students will require observation of them undertaking various laboratory procedures. They will ensure students receive the necessary experience to submit observation of procedure forms for five molecular genetic techniques.</p> <p>The course directors and module leads are also available to provide further academic support.</p>	

I	Criteria for admissions
<p>All initial applicants for the PGCert ICAG have been recruited, through rigorous national recruitment processes, to the Clinical Genetics training programme. Students who have successfully been awarded a National training Number (NTN) through this national recruitment process will be eligible to apply for the Clinical Genomics programme.</p> <p>Clinicians from other specialties and Clinician Scientists may wish to attend individual taught modules. These will be marketed independently; individuals attending one or more module(s) will not be considered as being enrolled on the postgraduate programme and so will not be subjected to the MSc entry requirements.</p>	

J	Career opportunities
<p>Training for clinical geneticists in the application of the latest genetic technologies has only recently been addressed by the creation of the PgCert ICAG. This course runs every two years and is nationally available. The MSc Clinical Genomics will enable high calibre trainees to develop further knowledge and skills placing them at competitive advantage at consultant interview and enable them to robustly use their</p>	

newly acquired skills in their daily clinical practice.

K	Methods for evaluating and improving the quality and standards of teaching and learning
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Student evaluation and feedback will be collected via EvaSys, an evaluation and survey software designed for use by HEIs. A standard, structured evaluation questionnaire will be used, based on a Likert-style rating scale. The numerical data will be collated onto a database which permits analysis of trends within and between modules. There is also the opportunity for the student to make free text comments within this system.

Collated evaluation data is interpreted by the Course Directors. These summaries will be presented as a standing agenda item at each Course Committee meeting where areas of good practice are disseminated and issues requiring action points agreed, with timescales and the allocation of responsibilities for actions. Progress on action points will be followed up at subsequent Course Committee meetings. Module evaluations are combined to give an annual, overall programme evaluation which will be used to inform the annual monitoring report. Feedback, in the form of summary data, will be disseminated to the sponsoring Trusts in which the student is working. Other types of informal evaluation may be used at the discretion of the module leader, to assist with specific aspects of module design or development. These may include evaluation of individual sessions particularly where these are led by outside speakers.

Student representatives are members of the Course Committee. Their role is to convey a student perspective and feedback on general programme management issues. Students may also feedback their comments on the programme to pathway leaders and module leaders.

L	Regulation of assessment
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Assessment will be regulated through:

- The Scheme of Assessment which will be reviewed and revised as necessary each year;
- The Genomic Medicine Board of Examiners, which meets at least three times a year to view student work and to ratify assessment results;
- An External Examiner who:
 - Is a member of the Board of Examiners;
 - Reviews student coursework and portfolios;
 - Provides an annual report which will be considered by the Course Committee.

M	Indicators of quality and standards
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Annual Programme Monitoring Report;
Student evaluation of modules;
Student representative feedback;

External Examiner reports;
Module pass rates and course completion rates.

Publication: This specification is available in the following locations: SGUL website; VLE; other*

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the course handbook and, where they are produced, separate module guides.

Key sources of information are:

Course documents

Student Handbook

The SGUL prospectus

Course leaflets

The SGUL internet site

General Regulations for students and programmes of study

QAA subject review reports