THE GLASGOW SCHOOL OF ART	**Programme Specification**

1. Programmes:

Programme Title	**UCAS Code (Completed by Registry post approval)**	**GSA Code (Completed by Registry post approval)**
MSc Visualisation with the following named awards: - International Heritage Visualisation - Medical Visualisation & Human Anatomy - Serious Games and Virtual Reality	Not Applicable	*MSCINTHER* *MSMEDVIS* *MSCGAMVR*

Head of School	Dr Paul Chapman
Head of Department/Programme Leader	Dr. Daniel Livingstone
Programme Contact	Dr. Daniel Livingstone

Minimum Duration of Study *(in months)*	12 months
Maximum Duration of Study *(in months)*	36 months
Mode of Study *(Full-time, part-time, etc)*	Full-time and part-time
Award to be Conferred	1. MSc International Heritage Visualisation 2. MSc Medical Visualisation & Human Anatomy 3. MSc Serious Games and Virtual Reality
Exit Awards	60 Credits (Including Core Research Skills): PG Cert in 1. International Heritage Visualisation 2. Medical Visualisation (for September intake, full-time) or Human Anatomy (for January intake, full time) or Medical Visualisation & Human Anatomy (part time) 3. Serious Games and Virtual Reality 120 Credits: PG Dip in 1. International Heritage Visualisation 2. Medical Visualisation & Human Anatomy 3. Serious Games and Virtual Reality 180 Credits: Master of Science in 1. International Heritage Visualisation 2. Medical Visualisation & Human Anatomy 3. Serious Games and Virtual Reality
Source of Funding *(e.g. SFC, etc)*	SFC, Personal

Version	Session	Date of Approval
18.19.02	2018/19	08/01/2016 – DDS BoS

3. SCQF Level:
11

3.1 Credits:
180

4. Awarding Institution:
University of Glasgow

5. Teaching Institutions:
The Glasgow School of Art/University of Glasgow

6. Lead School/Board of Studies:
School of Simulation and Visualisation

7. Programme Accredited By:
The Institution of Medical Illustrators (IMI) for MSc in Medical Visualisation and Human Anatomy

8. Entry Qualifications	
8.1 Highers	**N/A**
8.2 A Levels	**N/A**
8.3 Other	Bachelors Honours degree in a related discipline or equivalent professional practice. High calibre graduates from other disciplines may be considered if they are able to demonstrate an interest and ability in the field of visualisation.
8.4 IELTS Score Required on Entry	IELTS 6.0 (at least 5.5 for each component) for International Heritage and Serious Games & VR pathways IELTS 6.5 (at least 5.5 for each component) for Medical Visualisation & Human Anatomy pathway

9. Programme Scope:
The School of Simulation and Visualisation (formerly DDS) is the largest postgraduate research centre of the GSA, with a complement of multidisciplinary Masters students, PhDs and an international multidisciplinary academic and research staff. Since its inception in 1997, it has experienced substantial growth and has now located to new custom-built laboratories at Pacific

Quay, Scotland's Digital Media Quarter, Glasgow. Within this facility, Lab1 (the main teaching, research and educational laboratory) contains state of the art virtual reality, haptic and stereoscopic 3D projection facilities. The 3D projection facility in Lab1 is one of the largest in Europe. The DDS specialises in advanced 3D visualisation and interaction technologies. These technologies consist of 3D laser scanning, visualisation, 3D animation, 3D stereo displays, haptics, motion tracking, gesture based interaction, advanced interfaces, ambisonic sound, and machine vision. The primary focus of research and development is centred on user interaction with real-time digital data involving multidisciplinary skill sets. The DDS has built an international reputation in 3D visualisation and interaction research supported by new tools, techniques and methodologies.

The Master of Science (MSc) in Visualisation programme provides an academic framework for postgraduate students to engage with the application of 3D visualisation, computer graphics and games technologies across a variety of fields and in widely differentiated social, scientific, medical, technological and industrial contexts. The MSc programme creates a unique opportunity to combine architecture and heritage / human anatomy/ serious games with state of the art digital technologies, including 3D laser scanning, digital reconstruction of historic sites, artefacts or human anatomy, interaction and visualisation using virtual reality facilities.

Students are asked to locate their developing professional and personal practice within a specialist pathway: International Heritage Visualisation, Medical Visualisation & Human Anatomy, or Serious Games & Virtual Reality.

1. International Heritage Visualisation

While the rate of deterioration and disappearance of heritage sites has accelerated due to acceleration of human activities, major technological breakthroughs have occurred to enable high quality digital documentation, i.e. 3D digital capture has been developed allowing the creation of a high definition, high accuracy, and high productivity digital record. This technology has been adopted worldwide and over 3,000 international service providers are available to deploy this technology to facilitate the preservation of heritage sites. In addition, major innovations in digital image processing, 3D modelling software, broadband access, and computer hardware capabilities have allowed worldwide public access to voluminous data and information systems including 3D visualisation.

CyArk, a non-profit organisation with the mission of digitally preserving cultural heritage sites, has selected 500 of the world's most significant and endangered sites (CyArk 500) to be surveyed and digitally preserved within a 5-year time period.

The International Heritage Visualisation is a specialist pathway in the realm of 3D visualisation at DDS. The proposed MSc International Heritage Visualisation aims to develop the knowledge and skill sets required to deliver and conduct digital documentation of world heritage sites and to create a unique opportunity to combine architecture and heritage with state of the art digital technologies, including 3D laser scanning, digital reconstruction of historic sites and artefacts, interaction and visualisation using virtual reality facilities. It allows an ideal opportunity for documentation, maintenance, and preservation of significant cultural sites and physical heritage assets, and to reconstruct them in a real-time 3D environment for use in tourism, art, education, entertainment and science.

This pathway enables students to understand the process of creating original 3D datasets of cultural objects and sites, to reconstruct and present immersive visualisation with interactive narratives, and provide a novel approach to foster multi-disciplinary study in computer science, history, geography,

culture study, archaeology, architecture, the built environment, art and design, and tourist management, etc.

The MSc International Heritage Visualisation has emerged as a result of successful strategic research collaborations between the DDS and a number of partners in cultural heritage. DDS has various long-term partnerships with industry and governmental organisations and a world-leading portfolio of work. DDS and Historic Scotland have formed the Centre for Digital Documentation and Visualisation (CDDV) which specialises in the precise documentation and 3D representation of heritage objects, architecture and environments using state of the art, high resolution laser scanning technology and 3D visualisation software. The CDDV promotes and celebrates Scotland's cultural heritage at home and abroad and enhance Scotland's reputation for developing world class and innovative research and development. It is delivering the digital documentation of the five Scottish UNESCO World Heritage Sites and five International Heritage Sites in a five-year project known as the Scottish Ten.

The MSc International Heritage Visualisation provides a higher level taught programme to those emerging from a wide range of disciplines. This places those graduates in a leading global competitive position to advance in research, academia, governmental and commercial organisations, gaining a greater understanding of techniques that may assist in digital heritage practices.

2. Medical Visualisation & Human Anatomy

The MSc Medical Visualisation & Human Anatomy is offered by DDS at The Glasgow School of Art (GSA) in collaboration with the Laboratory of Human Anatomy (LHA), School of Life Sciences, University of Glasgow (GU).

It provides a unique opportunity to combine actual cadaveric dissection with 3D digital reconstruction, interaction and visualisation using state of the art virtual reality facilities. It allows students to examine human anatomy, and to reconstruct it in a real-time 3D environment for use in education, simulation, and training. This programme enables students to create original medical datasets, allows a greater understanding of "normal" anatomy and regional variations, and provides a novel approach to aid multi-disciplinary fields in anatomical knowledge, understanding, training and skills transfer. With the demand from clinicians of anatomical knowledge of students increasing (as a result in changes to medical and dental curricula) this pathway provides an ideal opportunity for enhancement of research into human anatomy, diagnostics, simulation, and visualisation.

This pathway has emerged as a result of successful strategic research collaboration between the School of Life Sciences, University of Glasgow and the DDS. Recent £1.5 million funding from NHS Education for Scotland has further extended the collaboration to now include key members in the dental, surgical and biological fields to create and develop 3D interactive digital visualisation packages supporting dental education. This award has brought together anatomical, dental, surgical, digital and scientific fields in a key move to allow collaborations with the Glasgow Dental School, Raigmore Hospital (Inverness), LHA and the DDS. These activities will feed back directly into the curriculum of the MSc Visualisation programme.

A strategically important area for academic development recommended by the General Medical Council (entitled Tomorrow's Doctors) is the advancement of technology and its role in education and training of future doctors, dentists, biomedical scientists, Allied Health Professionals (AHPs), computer scientists and related professions to each of these areas. With technology developing at such a fast pace, and forming key areas for strategic development in areas of Medicine, Dentistry and the AHPs from an educational and training perspective, a unique opportunity is emerging. This format exists in being able to use cadaveric material under licensed premises, combined with

expertise in 3D visualisation and interaction technologies based at the DDS. This type of academic provision has never been offered to this level, where a unique opportunity allows the use of cadaveric material authorised by the Bequeathal process under legislation by the Anatomy Act 1984, and its revisions in the Human Tissue (Scotland) Act 2006, to allow data capture (without identifying the individual) by using laser scanning technology. These data can then be digitally modelled, reconstructed, and be viewed in a 3D stereoscopic environment. This develops novel methodologies and tools to enhance the anatomical understanding of students and trainees across fields in Medicine, Surgery, Dentistry, Anatomy and all AHPs that need a solid grounding in anatomical knowledge.

The MSc Medical Visualisation & Human Anatomy provides a higher level taught programme to those emerging from a wide range of medical, and related, disciplines that wish to develop knowledge and understanding in medical visualisation. This will place those graduates in a leading global competitive position to advance in medical research, academia, commercial organisations, gaining a greater understanding of techniques that may assist in communication with patients and/or clinical diagnosis.

This pathway would be attractive to graduates in biomedical, dental, medical, surgical, and allied health professional programmes. It would also be an attractive programme to those with a computer science, mathematics, physics, computer graphics and visualisation specialties, including those employees from commercial organisations involved in designing, developing and marketing healthcare related products and simulation.

In relation to the medical undergraduate programme revisions at University of Glasgow, there is now a demand from clinicians from a wide variety of fields to be more aware of anatomical applications and imagery. The current medical curriculum at GU is now being revised accordingly to combine anatomical and radiological training. This means that with advances in imaging of patients as a diagnostic tool, this degree can reach across both the scientific and medical arenas. There is now a move clinically to incorporate 3D reconstruction of the arterial system, especially in relation to interventional procedures. Therefore, postgraduate trainees will need to be versed in the newer forms of imaging and data processing, which is key to this postgraduate programme.

In a core syllabus in anatomy for medical students (Tomorrow's Doctors 3) developed by the General Medical Council, the Medical Council of Ireland and Scottish Doctors, clinical images rendered as 3D reconstructions, standard P-A and lateral radiographs of all parts of the body with special views of clinically critical areas, contrast radiographs, axial CT and MRI series, nuclear images; ultrasound images, and endoscopic views should be incorporated in curricula of modern medical practice and healthcare and allied professions including dentistry and dental care professions, physiotherapy, radiography and human communication sciences. These areas are covered in the specialist courses of the proposed MSc Visualisation programme.

On the other hand, with the steadily increasing classroom use of multimedia resources, simulated 3D interactive visualisation has been used to support dental, anatomical, surgical and other medical education due to its advantages on low cost, time efficiency, automated processes, ability to store performance history, and less medical related accidents. To develop these educational/training packages, a broad understanding of graphics, animation, video, sound, human-computer interface, and biomedical data is required. This pathway will also result in developing and enhancing existing multidisciplinary medical expertise as well as individuals from different background of visualisation and simulation being involved in the design, development, and marketing medical educational tools, simulation suites, and other healthcare related products.

3. Serious Games and Virtual Reality

Games are huge business nowadays and the technology behind today's games is being implemented in other industries beyond entertainment. Serious games are games with purposes beyond just providing entertainment. Examples include, but are not limited to, edutainment, health games, and games for policy and social change. The serious games field has huge potential for growth, particularly in the realm of education. In fact, according to Ambient Insight, the U.S. game-based learning market reached $231.6 million in 2010, and the combined five-year compound annual growth rate (CAGR) for content, services, and tools is 12.3% and revenues will reach $413.2 million by 2015.

The academic sector is now responding to the growing global demand for Masters programmes in this area. Based on our expertise in 3D modelling and animation, motion capture technology, research activities of key members of academic staff in serious games, and the market demand of serious games, we develop the Serious Games and Virtual Reality pathway for the MSc Visualisation programme.

This pathway will be appealing to students from a wide range of disciplinary backgrounds ranging from computer science, life sciences, to business studies, education, social science and media studies, the course will allow them to develop industry appropriate skills for the 21st century knowledge economy, developing a unique portfolio of work and hands on experience.

The programme is delivered via a series of taught lectures, tutorials, set and elective projects, and self-directed learning. Students will be expected to engage in a high level of self-directed learning, research and independent critical reflection, as well as participating in the taught elements of the course of study.

10. Programme Aims:

The aims of the programme are:

• Develop students' awareness, knowledge and skills in 3D digital technology, and its applications in cultural heritage, medicine and healthcare, and serious games as appropriate to their chosen specialism

• Provide a practical introduction to commercial visualisation hardware and software, and use them to interactively explore, manipulate and understand 3D data captured from all types of sources

• Deploy the digital data acquisition, processing, archiving and presentation process as the synthesis of research, analysis, development and critique within the context of public, private and voluntary sectors while providing the context for scientific and technological change.

• Develop autonomous and self-directed exploration, individual expression and critical activity within an environment of professional and peer-critique.

• Encourage multi-disciplinary research in visualisation and related fields including computer science, history, culture study, archaeology, architecture, the build environment, art and design, tourist management, medical science, healthcare, and education, etc.

• Construct and apply research materials and methodology tailored to support a Masters project and its outcomes within an organisational context.

• Produce graduates capable of utilising key digital technologies to a professional level where their value to business, society and industry is made explicit.

10.1 Stage 1 Aims:

• Develop an understanding and knowledge of the key theories and techniques in 3D applications of digital technology in cultural heritage, medicine, healthcare, and other serious purposes beyond entertainment;

• Develop a comprehensive exploration of the relevant theoretical and practical issues involved in three-dimensional modelling and animation;

• Acquire knowledge of the principles and methods of 3D visualisation and apply these through the management of a small scale practical project;

• Acquire and develop an understanding of research methodologies.

• For Medical Visualisation & Human Anatomy, January start only: Generate through a research proposal a suitable project for Masters level, Stage 3, in relation to 3D visualisation as a research and technological practice.

10.2 Stage 2 Aims:

While there is no formal progression requirement from Stage 1 to Stage 2, some of the Stage 2 aims on the Heritage and Serious Games pathways build upon those from Stage 1. Part-time students must have taken stage 1 courses that are pre-requisites before taking any stage 2 courses that build upon them.
The Medical Visualisation & Human Anatomy pathway stages 1 and 2 are independent, and students do not need to have taken any stage 1 (Medical Visualisation) courses before beginning stage 2 (Human Anatomy).

• Develop advanced skills and independent problem solving skills of theoretical and practical processes, and an understanding of the collaborative processes within practice of digital heritage preservation, cadaveric dissection, or serious games & VR development;
• Use digital data acquisition hardware and software tools and related practices to explore, document and understand heritage objects, sites and context; (International Heritage pathway)
• Detail key areas of clinically relevant anatomy, including regional anatomical variation and build detailed understanding of anatomical legislation and health and safety codes relating a laboratory dealing with human body donations; (Medical Visualisation & Human Anatomy pathway)
• Generate through a research proposal a suitable project for Masters level, Stage 3, in relation to 3D visualisation as a research and technological practice. (Except: Medical Visualisation & Human Anatomy, January start)

10.3 Stage 3 Aims:

• Evidence a capacity for self-directed research and professional standard in a research project in the field of heritage/medical visualisation or serious games;
• Demonstrate, through a written report, critical and analytical reflection on the processes and research embodied in the research project.

11. Intended Learning Outcomes of Programme:

After full participation in and successful completion of the programme, students should be able to:
1. Demonstrate a critical understanding of effective methods of visualising 3D data that supports heritage objects, architecture, virtual environments, and medical data, as appropriate to their chosen specialism
2. Demonstrate practical skills involved using 3D digital technologies, e.g. data acquisition (2D and 3D), motion capture systems, commercial visualisation software, and Virtual Reality/user interfaces for visualisation applications in heritage, medicine and healthcare, and other domains.
3. Critically review and analyse existing problems, sources and knowledge in a manner that allows informed judgement and critical appreciation across multiple disciplines.
4. Communicate effectively with colleagues and professional bodies in a real-life context, using accepted terminology in related disciplines.
5. Apply research techniques to an independent research project based on acquisition, processing, and presentation of 3D digital data.
6. Plan and execute an individual research project that investigates themes within the field of 3D visualisation and related disciplines.

11.1 Intended Learning Outcomes of Stage 1

Knowledge and Understanding

- Apply knowledge at the forefront of key theories and methods in 3D applications of digital technology, 3D data acquisition, modelling, rendering, and animation techniques (theoretical and technological), and their applications in one of the specialism: heritage visualisation, medical practice, serious games
- Develop a critical understanding of 3D visualisation technologies and select appropriate methods to design and develop small-scale projects, in the context of the chosen specialism
- Demonstrate the capacity to produce an essay-based response to contemporary theoretical and technological debates in heritage/medical visualisation or serious games
- Display a critical understanding of relevant concepts, principles, research methods and methodologies through project work and practice

Applied Knowledge and Understanding

- Use a wide range of specialised software to support and enhance work and specify new software or improvements to existing software to increase effectiveness.
- Develop skills to enable independent learning (self directed learning) of theoretical and practical processes.
- Use a range of specialised skills, techniques, and practices, which are at the forefront of heritage/medical visualisation or serious games.
- Completion of set practical project(s) that demonstrate an understanding of the 3D visualisation processes.
- For Medical Visualisation & Human Anatomy, January start only: Develop knowledge of research methodologies within the context and preparation of a research proposal in the area of heritage/medical visualisation or serious games.

Professional Practice: Communication, Presentation, Working with Others

- Communicate to others key principles of research methodologies and their application within the research process.
- Communicate to others the underlying theoretical and practical framework within which heritage/medical visualisation systems or serious games are built.
- Communicate to a non-specialist audience the findings and relevance of research data and its application in various settings.
- Develop group working skills through the completion of practical projects.

11.2 Intended Learning Outcomes of Stage 2

- Knowledge and Understanding
- Knowledge of key areas and techniques in cadaveric dissection, clinically relevant anatomy, heritage visualisation pipeline, or serious games development as appropriate for one of the specialisms of heritage visualisation, medical practice, serious games
- Demonstrate a significant range of core skills, techniques and practices associated with human anatomy and dissection techniques, heritage visualisation, or serious games design and development.
- Demonstrate an understanding of the functioning of health and safety applied to a laboratory dealing with human body donations, and application of anatomical legislation relevant to laboratory practice, including the Bequeathal process (medical visualisation & human anatomy)

Applied Knowledge and Understanding

- Completion of an elective small-scale practical research project that demonstrates knowledge and understanding of human anatomy, heritage visualisation, or serious games.
- Recognise, understand and manage effectively different technical and approaches to the process of anatomical dissection, heritage visualisation, or serious games development.
- Pursue viable courses of action that demonstrate critical judgement through a practical project in relation to examples of heritage visualisation systems, human anatomy or serious games.
- Develop knowledge of research methodologies within the context and preparation of a research proposal in the area of heritage/medical visualisation or serious games. (Except: Medical Visualisation & Human Anatomy, January start)

Professional Practice: Communication, Presentation, Working with Others

- Communicate to others a developed understanding of the role of research methods within the domain of human anatomy, heritage visualisation, or serious games.
- Further develop group working skills at a strategic level through the completion of practical group projects.
- Apply a range of standard and specialised instruments and techniques of anatomical dissection (medical visualisation & human anatomy)

11.3 Intended Learning Outcomes of Stage 3

Knowledge and Understanding

- Plan and execute a significant individual research project that investigates themes within the field of heritage/medical visualisation, human anatomy, or serious games.
- Demonstrate and reflect upon the use of 3D heritage/medical visualisation or serious games through a Masters project.
- Demonstration of critical and analytical reflection on the Masters project through a written thesis.

Applied Knowledge and Understanding

- Recognise, understand, manage and critically reflect upon, to a high level, a range of technical and approaches to the process of heritage/medical visualisation or serious games
- Combine complex processes in the production of a research project in relation to the chosen specialism
- Pursue a project to a professional standard with a rigorous academic reflection on the processes undertaken.
- Application and management of a research project in relation to 3D visualisation.
- Demonstrate a critical and analytical review of the theoretical processes and concepts employed during the development and production of a research project.

Professional Practice: Communication, Presentation, Working with Others

- Critically review and analyse existing problems, sources and knowledge in a manner that allows informed judgement and critical appreciation.
- Communicate to a specialist audience a critical and reflective knowledge of the 3D visualisation process through the execution of a Masters research project and an analytical and reflective Masters thesis.
- Demonstrate the ability to critically reflect on the role of group dynamics and interplay as part of the production of a Masters project.
- Demonstrate to others a critical knowledge of key medical visualisation processes used within the chosen specialism through the production of a Masters research project and thesis.

12. Assessment Methods:

There will be three key summative assessment points in the academic year. Students may exit the programme with a Postgraduate Certificate after successfully completing 60 credits (including Core Research Skills), or a Postgraduate Diploma after successfully completing 120 credits. Interim awards will need to be surrendered if a student resumes their studies and successfully achieves a higher exit award.

The table below details the points in the programme where formal assessment is expected to take place (Full time).

Stage	Summative assessment points
Stage 1: PgCert	Weeks 12-15
Stage 2: PgDip	Weeks 28-30
Stage 3: MSc	Weeks 43-45

Students enrolled part time will be assessed at the end of each post-graduate term (with dates corresponding to the full-time stages) in each year, with final project submission in the summer of the second year.
The programme provides two forms of assessment, formative and summative. Formative assessment will take the form of seminars, tutorials, and so on, which provide the opportunity to refine and develop key principles in fields of enquiry, and to prepare for submission in the summative assessments, i.e. in assessed projects, coursework, presentations, written examinations, and in the final submission for the Research Project, or in the case of those exiting at Postgraduate Certificate or Postgraduate Diploma level, for the assessed projects, coursework, presentations, and written examinations. Each course will be examined against its specific Learning Outcomes as outlined in the course specification.

The assessment of the Masters in Sound for the Moving Image will be regulated by the GSA Code of Assessment, and the GSA section of the Glasgow University Academic Calendar.

13. Learning and Teaching Approaches:

Students will be expected to take significant responsibility for the management of their learning. Emphasis will be placed on developing and achieving self-reliance.

Courses and projects will be undertaken by directed and self-directed study, and will involve lectures, tutorials, workshops, practical sessions, guest lectures, and independent research.

• Self-directed Learning and Research
In line with other taught postgraduate programmes at GSA, significant emphasis in the MSc Visualisation programme is placed on self-directed study, from project design and development, to gaining theoretical knowledge through traditional research methods. This is further developed by the focus upon pathway specialism, which emphasises autonomy, reflection upon personal learning and self-directed project work within a collaborative environment.

• Lectures
Lectures and seminars are used to disseminate theoretical, contextual and historical knowledge and address specific issues underpinning practical work. Lectures also have the broad aim of generating further debate in seminars, tutorials or further enquiry in self directed learning or research.

• Tutorials, Workshops, and Practical sessions
The tutorial is designed to provide students with hands-on experience in lab sessions. These sessions usually follow lectures, and take place in computer and/or anatomy laboratories as practical classes. Lecturers/Demonstrators will be on-hand during the sessions to help students and answer their questions. The labs can be used by students at any time when DDS is open.

• Guest Speakers
Input from visiting lecturers and guest speakers will enable visualisation students access to, and understanding of, relevant contemporary practice, research and commercial contexts.

• Assessment
Formative and summative assessment strategies are employed through the MSc Visualisation programme. Formative and summative assessment feedback operates to guide students in improving their work, including interpersonal skills, formal presentation abilities, and academic writing and research.

14. Relevant QAA Subject Benchmark Statements and Other External or Internal Reference Points:

The programme accords with the QAA statement regarding Masters level education available at the following link:
http://www.qaa.ac.uk/en/Publications/Documents/Masters-Degrees-Characteristics.pdf

Furthermore the programme is aligned with the Level 11 Descriptors provided by the SCQF governing attainment during Masters level study, available at
http://scqf.org.uk/wp-content/uploads/2014/03/SCQF-Revised-Level-Descriptors-Aug-2012-FINAL-web-version1.pdf

15. Additional Relevant Information:

Students on the Visualisation programme will be taught and supervised by research active staff. Staff research interests will directly inform curriculum content, enhancing research-teaching linkages.

A student led Postgraduate Forum takes place normally twice a term and is a social opportunity for postgraduates to meet and discuss issues common to postgraduate study and invite speakers of interest. The forum is organised centrally, between GSA's taught postgraduate programmes. The Glasgow School of Art provides a comprehensive student learning support network, and specified support staff for international students. In addition, the language facilities at the University of Glasgow are available to students as pre-sessional classes. The Glasgow School of Art also offers an orientation programme for all new international students allowing them to meet other international students and staff at the beginning of their stay.

Academic and support staff contact time will be made explicit to students. Students will be aware of with whom and when they can expect contact. Reading lists and websites for each course will be identified to encourage students to use their independent study time effectively. Coursework requirements and assessment criteria will be made explicit and will relate to the specified aims and learning outcomes.

Notes on Part-Time Study

Part-time study is offered through a day-release mode, with part-time students taking the same classes at the same time as full time students. Part time study will generally require two days of attendance per week during the teaching period, and schedules will be provided in advance of each term to allow students to plan their time accordingly. Contact hours are supplemented through the use of online support through, e.g., virtual learning environments.

The Core Research Skills course Academic Skills for Masters Research will be offered to part-time students (only) during the summer at the end of the first year of study, delivered in a blended learning mode with scheduled tutorial dates and additional online learning support. Alternative Core Research Skills electives may be available, but Academic Skills for Masters Research will be recommended for part-time MSc Visualisation students.

Access to studios and GSA facilities is generally limited to the regular opening hours, with extended hours available at key points of the year. The DDS offers standard access hours year round. Reduced hours for access to workshops and library are in operation during the summer.

Results from each course will be presented at the postgraduate exam board immediately following. Resits are to be normally completed before, and presented at, the next postgraduate exam board. (Postgraduate exam boards take place typically at the end of January, May and August each year, corresponding to the full-time study stages.)

16. Programme Structure and Features:

1. International Heritage Visualisation

STAGE 1				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Core Research Skills for Postgraduates	15	11		100
3D Modelling & Animation	15	11		100
Interactive Heritage Visualisation	15	11		100

Digital Documentation of Cultural Heritage	15	11	50	50
Total	**60**	**11**		
Exit Award			**PG Cert**	

STAGE 2				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Data Acquisition & Processing	30	11		100
2 x GSA or DDS Elective: The following are recommended: ➢ Mapping the City ➢ Environmental Design Sound ➢culture ➢ The Film Making Process ➢HCI, Virtual & Augmented Reality ➢Audio for games & interactive applications	15 15	11 11		
Total	**60**	**11**		
Exit Award			**PG Dip**	

STAGE 3				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
MSc Research Project	60	11		100
Total	**60**	**11**		
Exit Award			**Masters**	

2. Medical Visualisation & Human Anatomy

STAGE 1				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Core Research Skills for Postgraduates	15	11		100
3D Modelling & Animation	15	11		100
Applications in Medical Visualisation	15	11	50	50
Volumetric Visualisation	15	11	50	50
Total	**60**	**11**		
Exit Award			**PG Cert**	

STAGE 2				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Introduction to Anatomy	20	11		100

Structure and Function of the Human Body	20	11		100
Cadaveric Dissection Techniques	20	11		100
Total	**60**	**11**		
Exit Award			**PG Dip**	

STAGE 3				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
MSc Research Project	60	11		100
Total	**60**	**11**		
Exit Award			**Masters**	

Students undertaking this programme split their time equally between the University of Glasgow (LHA) and the GSA (DDS). The programme is delivered as two core areas – digital technologies applied to medical visualisation (delivered by the DDS at Stage 1) and human anatomy (delivered by the LHA at Stage 2).

The programme is constructed from courses of a multiple of 15 credits in Stage 1 at GSA, and from courses of a multiple of 20 credits in Stage 2 at University of Glasgow. Students will be able to exit the programme at three points, with a Postgraduate Certificate (60 credits), a Postgraduate Diploma (120 credits), or a full MSc (180 credits).

3. Serious Games & Virtual Reality

STAGE 1				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Core Research Skills for Postgraduates	15	11		100
Game Programming	15	11		100
Serious Games Design and Research	15	11		100
DDS Elective: Choose one from ➢ Interactive Heritage Visualisation ➢ Applications in Medical Visualisation	15	11	50	50
Total	**60**	**11**		
Exit Award			**PG Cert**	

STAGE 2				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
Human Computer Interaction,Virtual and Augmented Reality	15	11		100
Audio for games & interactive applications	15	11		100
Serious Game Development	15	11		

GSA Elective	15	11		
Total	**60**	**11**		
Exit Award			**PG Dip**	

STAGE 3				
Course (Core)	**SCQF Credits**	**SCQF Level**	**Examination (%)**	**Coursework (%)**
MSc Research Project	60	11		100
Total	**60**	**11**		
Exit Award			**Masters**	

Part time mode

Part time study is offered as *day-release*, with part time students attending courses alongside full-time students during autumn and spring terms. Core Research Skills will be offered as a summer class in the first year of part-time study, and is the only class not shared with full time students, with a restricted choice of options. Students may be required to take the Core Research Skills course "Academic Skills for Masters Research". The structure of part-time study for each pathway is shown in the following set of diagrams.

1. International Heritage Visualisation

Course Map - MSc International Heritage Visualisation

FULL TIME

		Course	Credits	Exit Award
Cohort 1	Autumn	Digital Documentation of Cultural Heritage	15	
		3D Modelling and Animation	15	
		Interactive Heritage Visualisation	15	
		Core Research Skills	15	
			|---> PGCert	
	Spring	Data Acquisition & Processing	30	
		Cross school or DDS Elective	15	
		Cross school or DDS Elective	15	
			|---> PGDip	
	Summer	Masters Research Project	60	
			|---> MSc	
Cohort 2	Autumn	Digital Documentation of Cultural Heritage	15	
		3D Modelling and Animation	15	
		Interactive Heritage Visualisation	15	
		Core Research Skills	15	
			|---> PGCert	
	Spring	Data Acquisition & Processing	30	
		Cross school or DDS Elective	15	
		Cross school or DDS Elective	15	
			|---> PGDip	
	Summer	Masters Research Project	60	
			|---> MSc	

PART TIME

Cohort 1

		Course	Credits	Exit Award
Year 1	Autumn	Digital Documentation of Cultural Heritage	15	
		3D Modelling and Animation	15	
	Spring			
		Cross school or DDS Elective*	15	
		Cross school or DDS Elective	15	
	Summer			
		Core Research Skills	15	
			|---> PGCert	
Year 2	Autumn			
		Interactive Heritage Visualisation	15	
	Spring	Data Acquisition & Processing	30	
			|---> PGDip	
	Summer	Masters Research Project*	60	
			|---> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|---> MSc	

*Masters Research Project to be completed to schedule agreed within three year limit
*Students aiming to complete with PGCert only take ONE elective

Maximum duration of study for part-time is normally 36 months.
With leave of absence, maximum duration of study is 48 months

Part time students must register for a minimun of 45 taught credits per academic year
Part time students may register for a maximun of 75 taught credits per academic year

PART TIME

Cohort 2

		Course	Credits	Exit Award
Year 1	Autumn	Digital Documentation of Cultural Heritage	15	
		3D Modelling and Animation	15	
	Spring			
		Cross school or DDS Elective*	15	
		Cross school or DDS Elective	15	
	Summer			
		Core Research Skills	15	
			|---> PGCert	
Year 2	Autumn			
		Interactive Heritage Visualisation	15	
	Spring	Data Acquisition & Processing	30	
			|---> PGDip	
	Summer	Masters Research Project*	60	
			|---> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|---> MSc	

2. Medical Visualisation and Human Anatomy

Course Map - MSc Medical Visualisation & Human Anatomy

FULL TIME

	Term	Course	Credits	Exit Award
Cohort 1	Autumn	Volumetric Visualisation	15	
		3D Modelling & Animation	15	
		Core Research Skills	15	
		Apps in Medical Visualisation	15	
			|----> PGCert	
	Spring	Introduction to Anatomy	20	
		Cadaveric Dissection Techniques	20	
		Structure and Function of the Human Body	20	
			|----> PGDip	
	Summer	Masters Research Project	60	
			|----> MSc	
Cohort 2	Autumn	Volumetric Visualisation	15	
		3D Modelling & Animation	15	
		Core Research Skills	15	
		Apps in Medical Visualisation	15	
			|----> PGCert	
	Spring	Introduction to Anatomy	20	
		Cadaveric Dissection Techniques	20	
		Structure and Function of the Human Body	20	
			|----> PGDip	
	Summer	Masters Research Project	60	
			|----> MSc	

PART TIME

	Term	Course	Credits	Exit Award
Cohort 1 Year 1	Autumn	Volumetric Visualisation	15	
		3D Modelling & Animation	15	
	Spring	Introduction to Anatomy	20	
	Summer	Core Research Skills	15	
			|----> PGCert	
Year 2	Autumn	Apps in Medical Visualisation	15	
	Spring	Cadaveric Dissection Techniques	20	
		Structure and Function of the Human Body	20	
			|----> PGDip	
	Summer	Masters Research Project*	60	
			|----> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|----> MSc	

*Masters Research Project to be completed to schedule agreed within three year limit
*Students aiming to complete with PGCert only take ONE elective

Maximum duration of study for part-time is normally 36 months.
With leave of absence, maximum duration of study is 48 months

Part time students must register for a minimun of 45 taught credits per academic year
Part time students may register for a maximun of 75 taught credits per academic year

PART TIME

	Term	Course	Credits	Exit Award
Cohort 2 Year 1	Autumn	Volumetric Visualisation	15	
		3D Modelling & Animation	15	
	Spring	Introduction to Anatomy	20	
	Summer	Core Research Skills	15	
			|----> PGCert	
Year 2	Autumn	Apps in Medical Visualisation	15	
	Spring	Cadaveric Dissection Techniques	20	
		Structure and Function of the Human Body	20	
			|----> PGDip	
	Summer	Masters Research Project*	60	
			|----> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|----> MSc	

3. Serious Games and Virtual Reality

FULL TIME

	Term	Course	Credits	Exit Award
Cohort 1	Autumn	Game Programming	15	
		Serious Games Design & Research	15	
		Visualisation Elective*	15	
		Core Research Skills	15	
			|----> PGCert	
	Spring	Motion Capture & Interaction	15	
		Audio for games & interactive applications	15	
		Serious Game Development	15	
		Cross school or DDS Elective	15	
			|----> PGDip	
	Summer	Masters Research Project	60	
			|----> MSc	
Cohort 2	Autumn	Game Programming	15	
		Serious Games Design & Research	15	
		Visualisation Elective*	15	
		Core Research Skills	15	
			|----> PGCert	
	Spring	Motion Capture & Interaction	15	
		Audio for games & interactive applications	15	
		Serious Game Development	15	
		Cross school or DDS Elective	15	
			|----> PGDip	
	Summer	Masters Research Project	60	
			|----> MSc	

*Visualisation elective is ONE of:
Applications in Medical Visualisation
OR Interactive Heritage Visualisation

PART TIME

	Term	Course	Credits	Exit Award
Cohort 1 Year 1	Autumn			
		Serious Games Design & Research	15	
		Visualisation Elective*	15	
	Spring	Motion Capture & Interaction	15	
		Audio for games & interactive applications	15	
	Summer			
		Core Research Skills	15	
			|----> PGCert	
Year 2	Autumn	Game Programming	15	
	Spring			
		Serious Game Development	15	
		Cross school or DDS Elective	15	
			|----> PGDip	
	Summer	Masters Research Project*	60	
			|----> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|----> MSc	

*Masters Research Project to be completed to schedule agreed within three year limit
*Students aiming to complete with PGCert take only one spring course.

Maximum duration of study for part-time is normally 36 months.
With leave of absence, maximum duration of study is 48 months

Part time students must register for a minimun of 45 taught credits per academic year
Part time students may register for a maximun of 75 taught credits per academic year

PART TIME

	Term	Course	Credits	Exit Award
Cohort 2 Year 1	Autumn			
		Serious Games Design & Research	15	
		Visualisation Elective*	15	
	Spring	Motion Capture & Interaction	15	
		Audio for games & interactive applications	15	
	Summer			
		Core Research Skills	15	
			|----> PGCert	
Year 2	Autumn	Game Programming	15	
	Spring			
		Serious Game Development	15	
		Cross school or DDS Elective	15	
			|----> PGDip	
	Summer	Masters Research Project*	60	
			|----> MSc	
		OR		
	Autumn	Masters Research Project*	60	
			|----> MSc	

Dual intake

The main student intake is in September but, subject to approval, it is also possible to begin studying this programme in January. An example of a Medical Visualisation and Human Anatomy full time student who starts in January is listed below.

Spring semester	
Course	**SCQF Credits**
Introduction to Anatomy	20
Structure and Function of the Human Body	20
Cadaveric Dissection Techniques	20
Total	**60**
Exit Award	**PG Cert Human Anatomy**

Summer break between May and September

Autumn semester	
Course	**SCQF Credits**
Core Research Skills for Postgraduates	15
3D Modelling & Animation	15
Applications in Medical Visualisation	15
Volumetric Visualisation	15
Total	**60**
Exit Award	**PG Dip Medical Visualisation & Human Anatomy**

Stage 3 from January to May	
Course	**SCQF Credits**
MSc Research Project	60
Total	**60**
Exit Award	**MSc Visualisation (Medical Visualisation & Human Anatomy)**

17. Can exemptions be granted?
Yes ☐ **No** ☒
If yes, please explain: Click here to enter text.

18. Does the programme comply with GSA APEL policy?
Yes ☒ **No** ☐
If no, please explain: Click here to enter text.

19. Are there any arrangements for granting advanced entry?
Yes ☐ **No** ☒
If yes, please explain: Click here to enter text.

20. Are there any arrangements for allowing students to transfer into the programme?
Yes ☐ **No** ☒
If yes, please explain stating requirements and levels to where this can apply: Click here to enter text.

21. Are there any arrangements for allowing students to transfer into other programmes?
Yes ☐ **No** ☒
If yes, please clarify: Click here to enter text.

22. What are the requirements for progressing from each stage?
The criteria of assessment and progression are linked to the learning outcomes for the PgCert, PgDip and Masters stages of the programme. There is no formal progression requirement to progress from Stage 1 to Stage 2. Students must achieve at least an average grade of C in the taught (Stages 1 and 2) part of the programme to proceed to Stage 3. For all three stages of the programme, students will normally be assessed on the presentation of practical work, written submissions and/or verbal presentations, and written examinations. Each course will be examined against its specific Learning Outcomes and accumulation of the SCQF credits that these confer. Pg Cert: After attaining 60 credits, including Core Research Skills, students can exit with a PgCert, as long as the student meets the requirements for award of PGCert as specified in the University of Glasgow Academic Calendar, GSA Section. (A grade point average of 9, equivalent to grade D, with at least 40 credits at grade D or above.) PG Dip: At the end of Stage 2, assessment provides a point for those wishing to exit with the PgDip. A PgDip exit award is available where a student has taken all taught courses (120 credits) and meets the requirements for award of PGDip as specified in the University of Glasgow Academic Calendar, GSA Section. (A grade point average of 9, equivalent to grade D, with not less than 80 of these credits at grade D or above). At this stage of the programme, students can elect to continue their study at Masters Level, subject to meeting the relevant criteria. All students selecting this option must complete a proposal of study for the final research project. Masters: At the end of Stage 3, assessment consists of a review of practical work, written thesis and a verbal presentation.

23. Please confirm that the programme follows GSA Board of Examiner policy and procedures, including External Examiner participation:
Yes ☒ **No** ☐
If no, please explain: Click here to enter text.

24. Please explain programme management and committee arrangements up to, but not including, Boards of Study:

The programme is managed by a Programme Leader (PL) who is responsible for academic standards and direction, handles programme logistics, admissions, timetabling, day-to-day issues around implementation and operation of the curriculum, and leads the Programme Team. The PL is supported by the programme team from the Digital Design Studio, Glasgow School of Art (and from the Laboratory of Human Anatomy, School of Life Sciences, University of Glasgow for the Medical visualisation & human anatomy pathway).

Each member of the programme team specialises in their particular disciplinary area – 3D modelling and animation; medical visualisation; human anatomy; heritage visualisation; and serious games – and ensures the rigour and appropriateness of academic materials, teaching practice and assessment regime specific to each Pathway. These individuals ensure a balance of broad overview and granular specificity regarding programme operation and the courses that comprise this. The programme team attend the Staff Student Consultative Committee (SSCC) with student representatives, which reports to Board of Studies. The PL also convenes a Masters programme meeting once per term to govern operational and staffing matters, and are charged with implementing any issues around quality assurance or enhancement that arise from the External Examiner's visits or Annual Programme Monitoring.

25. Please explain the systems and arrangements regarding:

a) Quality assurance of the management, operation and monitoring of the programme

Responsibility for the conduct of the programme will rest with the Programme Leader. A Student/Staff Consultative Committee will meet to consider operational matters, while the Examination Board will be responsible for the award of the degree and for issues relating to progression. All Committees connected to the programme will operate according to standard procedures determined by the Academic Council of The Glasgow School of Art. The Student/Staff Consultative Committee will report to the DDS Board of Studies, which reports to the GSA Undergraduate and Postgraduate Committee.

The Programme Leader will have executive responsibility for the direction, coordination and administration of the programme. He/she will be primarily responsible for the initiation of programme developments, and will have particular responsibility for the monitoring of student progress and for the continuous monitoring of the quality of the programme in line with The Glasgow School of Art procedures.

In order to ensure that quality standards are monitored and the quality of provision continually enhanced, the MSc programme will undertake the following:

- regular programme team meetings
- Student/Staff Consultative Committee
- Annual Programme Monitoring
- Quinquennial Periodic Review
- Institutional review in accordance with the Quality Assurance Agency (QAA) and the Scottish Credit and Qualifications Framework (SCQF)

The programme team includes a senior member of staff from GU, Dr. Paul Rea and a deputy, who will attend the above committees as appropriate to ensure smooth communication between the two institutions regarding the Medical visualisation & Human anatomy pathway. He also represents the interest of the programme on University of Glasgow committees, keep the programme team

informed of changes, and advise the team on appropriate responses.

b) Student feedback and representation

Students will have the opportunity to feed back to staff through the Student/Staff Consultative Committee (SSCC), a forum for discussion about all aspects of the programme and student experience at the GSA. The SSCC will meet during each Stage of the Programme and will report to the Digital Design Studio's Board of Studies.

c) Programme based student support

Students are supported in their studies by a number of different departments and support mechanisms.

For academic studies, course leaders are the main source of academic support. Should there be any matters that cannot be dealt with by them students should consult the Programme Leader. Additional support for studies is through the DDS specialised computer studios, GSA Library and Computer Centre where students will find books, journals, DVDs, videos, theses and dissertations. Further information can be found at http://www.gsa.ac.uk/library

Students receive a short induction programme in the computer centre where students will be given a GSA email account. This will be used for all electronic communication with them while they are on the programme and can be accessed via http://webmail.gsa.ac.uk

The Virtual Learning Environment (VLE) also supports academic studies. There are Learning Support & Development Tutors who specialise in supporting the processes of learning and offer specific services to students who are disabled in the learning environment or have specific learning difficulties. There is English Language support for students whose first language is not English and Careers advice for students on creative careers, enterprise and career planning throughout their studies. The Counselling Service provides confidential professional advice and is available to all students. The Student Welfare Service offers practical advice and information on a range of issues including funding and private sector accommodation and provides advice and support to international students. Email addresses and further information for all Student Support Services are to be found on the VLE. The Student Association acts as both a formal and informal focus for student activity and mutual support. They can be contacted at http://www.gsasa.org

Students on the Medical Visualisation & human anatomy pathway will be housed in Laboratory of Human Anatomy at University of Glasgow during the Spring semester and during Stage 3 if their MSc projects require access to the Anatomy Lab. They will be housed in DDS during the Autumn semester and Stage 3. Students on the International heritage and Serious games pathways will be housed in DDS during period of their studies.