



Programme Specification (PG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	MSc FT Computer Science - Media and Arts Technology
Name of interim award(s):	N/A
Duration of study / period of registration:	1 year
Queen Mary programme code(s):	PMSF-QMCOMP1: PSMTC - Admissions code: PFQM-I4U6-09
QAA Benchmark Group:	Computing
FHEQ Level of Award:	Level 7
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Electronic Engineering & Computer Science

Schools / Institutes which will also be involved in teaching part of the programme:

School of Engineering & Materials Science

Collaborative institution(s) / organisation(s) involved in delivering the programme:

Programme outline

The MSc in Media and Arts Technology is a cross-disciplinary programme which aims to train a new generation of designers, engineers and researchers in digital innovation applied to the creative sector. Students will learn how to combine interaction design and the study of human behavior with the computing, research and software development techniques of engineering and computer science. The programme builds on compulsory modules in human-computer interaction, physical computing, and a wide range of elective modules which students can choose in any of the following three themes:

- Sound, Image, and Games
- Interaction, Intelligence, and Sensing

- Creative Industry

The Sound, Image, and Games theme is concerned with theoretical and practical skills for the production or computational analysis of audio-visual content, as well as perceptual and aesthetic perspectives on music and film media.

The Interaction, Intelligence, and Sensing theme is concerned with theoretical and practical skills relevant for media and arts technology, from human-computer interaction and research methods and responsible innovation, to physical computing, advanced sensing, artificial intelligence, Internet of Things, and robotics.

The Creative Industry theme is concerned with skills for the strategic management of research and development for innovative technology-based organisations, and ethics, legal, and intellectual property aspects applied to advanced digital information processing.

Students will benefit from a programme that offers a flexible module structure. The MSc in Media and Arts Technology has a large number of elective modules to choose from, enabling students to tailor their studies to suit their academic interests and career goals. Students will have the opportunity to gain both generalist and specialist skills. The programme provides a unique combination of modules at the intersection of science, technology, digital media and the arts, provided by the School of Electronic Engineering and Computer Science and the School of Engineering and Material Science.

In their final Master's project, students will draw together the knowledge and skills from the taught component to address a research challenge of significant scope to be undertaken at QMUL.

The MAT teaching environment benefits from state-of-the-art facilities and equipment including the qMedia Studios (world-class studios for recording and production, performance, and multimodal research), the Materials Processing Lab (a specialised facility for prototyping flexible materials, textile circuits and 3D printing), MAT equipment (e.g. for audio, video, light, virtual reality), the Electronics Lab (over 80 computers for dedicated hardware project use, 30+ advanced Agilent Oscilloscopes, Power Electronic systems, Microprocessor development tools, state of the art PCB production capabilities, all combined with modern teaching facilities). Students will also have access to dedicated shared workspaces and digital audio workstations.

The programme builds on the outstanding success of Queen Mary's Media and Arts Technology (MAT) Centre for Doctoral Training. It addresses all three of EPSRC's Digital Economy themes, particularly Digitally Connected Citizens and many ICT themes, especially Next Generation Interaction Technologies, Data to Knowledge, ICT for Manufacturing, and Digital Healthcare.

The programme is positioned to appeal to highly able students who combine technical and creative skills in disciplines including computer science, electronic engineering, physics, psychology, cognitive science, human-computer interaction, ergonomics, design, media and communication, art, music, film, photography, architecture, computational linguistics, and social science.

For more information, please visit: <http://www.mat.qmul.ac.uk/>

Aims of the programme

The blending of courses covering technical, computational and practical media and arts technology topics as well as optional business courses, will equip the graduates with the skills that are necessary to understand and to contribute to the modern media and arts sectors of the digital economy.

The Media and Arts Technology programme aims to:

- Prepare students for cross-disciplinary design and research that combines advanced methodological, technical, and creative skills
- Expose students to the research environment and practices, and the current state-of-the-art innovation in technologies for Media and Arts in the creative sector
- Develop critical, analytical, and presentational skills
- Ensure the production of an original MSc research project
- Produce graduates with cross-disciplinary skills who can contribute to the creative economy

What will you be expected to achieve?

The MSc in Media and Arts Technology programme seeks to produce postgraduates who combine world-class technical and creative skills to shape digital transformation to improve lives. The course of study provides a unique bridge between interaction design, computing, research and business, to learn how to create innovative interactive media, artistic products and technologies based on analyses of user behavior and experience.

It is a full-time programme which comprises two main components:

- Eight advanced taught modules completed during the first two semesters (four modules per semester) worth 120 credits;
- A Master's project with a QMUL research group in the second and third semesters worth 60 credits.

Learning outcomes:

- Learn how to design interactive systems, define how people interact and evaluate usability and user experience
- Understand the full research cycle from framing a question through to communication of results
- Critically assess a range of research methods ranging from qualitative through to experimental research
- Enhanced technical knowledge in areas relevant to research interests
- Critical appreciation of the technical and creative state-of-the-art in contemporary applications of digital media
- Develop entrepreneurship skills and understand legal aspects in science and the creative sector
- Experience of extended critical and analytical writing through a research paper and reflective essay for the Master's project

Academic Content:	
A 1	Learn the design of computer-based interactive, mobile and smart technology, focusing on the interfaces between people and systems
A 2	Learn evaluation techniques to assess user performance, preference and experience in relation to user-centred interactive systems
A 3	Learn audio/video data capture, processing and intelligent sensing, with an understanding of how these systems can be used creatively for audiovisual and computer-based content production and robotics
A 4	Principles of operation, limitations, potential and effective use of electronic media and their associated tools and technologies
A 5	A clear understanding and application of the full research cycle from framing a question through to communication of results

Disciplinary Skills - able to:	
B 1	Analyse information and experiences, formulate independent judgments, and articulate reasoned arguments through reflection, review and evaluation
B 2	Source, navigate, select, retrieve, evaluate, manipulate and manage information from a variety of sources, and make contributions to such sources
B 3	Critically assess and apply a range of research methods ranging from qualitative through experimental to practice-based research
B 4	Carry out extended critical and analytic writing through a research paper and reflective essay for the Masters project
B 5	Analyse complex, novel and diverse situations, and identify and innovate appropriate methods of working and communicating

Attributes:	
C 1	Work independently on a research-based project under supervision
C 2	Work effectively as part of a team, identifying tasks and roles, and managing time, resources and progress appropriately
C 3	Design, plan, manage, implement, evaluate and report a significant individual project in electronic media design and technology
C 4	Make effective use of enabling computer technologies for media production
C 5	Apply technical knowledge, understanding and skills in new situations

How will you learn?

The taught programme is delivered using a blended learning model through a mixture of lectures, tutorials, seminars, group projects and help sessions, depending on modules. Students are exposed to state-of-the-art design and computing methods and are encouraged to identify innovative and high impact research areas for their Master's research project. Coursework activities are often structured around individual or group projects, such as the evaluation of a system or the creation of a prototype, production of new media, presentations, reflective reports and research papers. The final Master's project is an individual research project undertaken at QMUL under the supervision of an academic. The course is full time for one year.

The taught modules give each cohort a common grounding in core technical and creative skills and ensure that each student develops enhanced skills through specialist options. We encourage a "maker" culture and integrate presentation into coursework assessments. Programming is taught as a fundamentally creative process and we underline the importance of understanding arts practice to successful technical work. The combination and range of teaching, learning and assessment strategies are designed to ensure that MAT MSc students from a wide range of disciplinary backgrounds are able to take advantage of each other's experience and achieve a high level of critical, theoretical and practical skills.

We estimate that full-time students spend 35 - 42 hours per week on their studies including taught modules, study time and coursework completion. In Semesters A and B, about 12-18 hours per week are spent in lectures/labs/seminars and the remainder of the time is independent study. In Semesters B and C, students can expect 20 hours of supervision for their Master's project.

Students will also take advantage of expertise across the college and within the partner organisations providing guest lectures, masterclasses and, where appropriate, formal and informal evaluation of project work.

Creative sector partner organisations include Abbey Road Studios, Apple, APT sound connections, Audio Network, Augmented Instruments, BBC, The British Film Institute, BigDog Interactive, BT, Channel 4 TV, Chordify, Cinimod, Codex, Deezer, ELBA, Healum, Holonic Systems, HyVibe, IBM, Illustrious, Inition, L-Acoustics Group, last.fm, Lateral LCACE, Le Sound by Novelab, London Development Agency, Lonofi, LShift, Mashtraxx, M&C Saatchi, Meridian, MiMu Gloves, Mind Music Labs, Music Group / Music Tribe Brands, Noldus, Normally.com, Philips Research Laboratories, OHMI Trust, Ovomind, proboscis, QinetiQ, radioscape, The Rattle, ROLI, Seeper, Sensing Feeling, Sony Computer Entertainment, Spotify, Solid State Logic, Steinberg, Superflux, Tapes UK, The Talent Business, Tekja.

How will you be assessed?

The combination and range of teaching, learning and assessment strategies are designed to ensure that students from a wide range of disciplinary backgrounds are able to take advantage of each other's experience and achieve a high level of critical, theoretical and practical skills.

The module learning objectives are assessed using formative and summative assessment including coursework, exams, projects, practical work, presentations and reports.

The assessment of the Master's research project is done through the production of a research paper, a reflective essay, and a viva presentation.

How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

Students undertake modules to the value of 180 credits.

The programme consists of four 15-credit compulsory modules, four 15-credit elective modules, and a 60-credit research project core module.

SEMESTER A:

Semester A consists of two 15-credit compulsory modules and two 15-credit elective modules (four modules in total).

Compulsory Modules:

ECS742P Interactive Digital Multimedia Techniques
ECS712P Design for Human Interaction

Elective Modules:

- Sound, Image, and Games:

ECS749P Sound Recording and Production Techniques
ECS741P Music Perception and Cognition
ECS709P Introduction to Computer Vision
ECS762P Computer Graphics
ECS7003P Multi-game platform development
ECS7002P Artificial Intelligence in Games

- Interaction, Intelligence, and Sensing:

ECS7007P Research Methods and Responsible Innovation
ECS780P Computer Programming
ECS7009P Introduction to Software Engineering
ECS740P Database Systems
ECS763P Natural Language Processing
ECS764P Applied Statistics
ECS783P Enabling Communication Technologies for IoT
ECS700P Electronic Sensing
ECS759P Artificial Intelligence
ECS766P Data Mining

SEMESTER B

Semester B includes two 15-credit compulsory modules and two 15-credit elective modules (four modules in total).

Compulsory modules:

ECS733P Interactive System Design
ECS784P Data Analytics

Elective modules:

- Sound, Image, and Games:

ECS7006P Music Informatics
ECS7012P Music and Audio Programming

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ECS7013P Deep Learning for Audio and Music
 ECS795P Deep Learning and Computer Vision
 ECS7022P Computational Creativity

- Interaction, Intelligence, and Sensing:

ECS612P Interaction Design
 ECS757P Digital Media and Social Networks
 ECS736P Information Retrieval
 ECS794P Cognitive Robotics
 DENM011 Robotics

- Creative Industry:

ECS745P Business Information Systems
 ECS7025P Ethics, Regulation and Law in Advanced Digital Information Processing and Decision

SEMESTERS B-C

A 60-credit MSc research project core module is conducted in Semesters B and C.

Core module:

ECS751P MSc Project

Please note that the enrollment in elective modules is subject to satisfaction of module prerequisites, space and time tabling.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Interactive Digital Multimedia Techniques	ECS742P	15	7	Compulsory	1	Semester 1
Sound Recording and Production Techniques	ECS749P	15	7	Elective	1	Semester 1
Music Perception and Cognition	ECS741P	15	7	Elective	1	Semester 1
Introduction to Computer Vision	ECS709P	15	7	Elective	1	Semester 1
Computer Graphics	ECS762P	15	7	Elective	1	Semester 1
Multi-game platform development	ECS7003P	15	7	Elective	1	Semester 1
Artificial Intelligence in Games	ECS7002P	15	7	Elective	1	Semester 1
Design for Human Interaction	ECS712P	15	7	Compulsory	1	Semester 1

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Research Methods & Responsible Innovation	ECS7007P	15	7	Elective	1	Semester 1
Computer Programming	ECS780P	15	7	Elective	1	Semester 1
Introduction to Software Engineering	ECS7009P	15	7	Elective	1	Semester 1
Database Systems	ECS740P	15	7	Elective	1	Semester 1
Natural Language Processing	ECS763P	15	7	Elective	1	Semester 1
Applied Statistics	ECS764P	15	7	Elective	1	Semester 1
Enabling Communication Technologies for IoT	ECS783P	15	7	Elective	1	Semester 1
Electronic Sensing	ECS700P	15	7	Elective	1	Semester 1
Artificial Intelligence	ECS759P	15	7	Elective	1	Semester 1
Data Mining	ECS766P	15	7	Elective	1	Semester 1
Interactive System Design	ECS733P	15	7	Compulsory	1	Semester 2
Music Informatics	ECS7006P	15	7	Elective	1	Semester 2
Music and Audio Programming	ECS7012P	15	7	Elective	1	Semester 2
Deep Learning for Audio and Music	ECS7013P	15	7	Elective	1	Semester 2
Deep Learning and Computer Vision	ECS795P	15	7	Elective	1	Semester 2
Computational Creativity	ECS7022P	15	7	Elective	1	Semester 2
Interaction Design	ECS612P	15	6	Elective	1	Semester 2
Digital Media and Social Networks	ECS757P	15	7	Elective	1	Semester 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Data Analytics	ECS784P	15	7	Compulsory	1	Semester 2
Information Retrieval	ECS736P	15	7	Elective	1	Semester 2
Cognitive Robotics	ECS794P	15	7	Elective	1	Semester 2
Robotics	DENM011	15	7	Elective	1	Semester 2
Business Information Systems	ECS745P	15	7	Elective	1	Semester 2
Ethics, Regulation and Law in Advanced Digital Information Processing and Decision	ECS7025P	15	7	Elective	1	Semester 2
MSc Project	ECS751P	60	7	Core	1	Semesters 2 & 3

What are the entry requirements?

The MSc in Media and Arts Technology is a cross-disciplinary programme and we welcome applications from a range of backgrounds.

Degree requirements

The programme is positioned to appeal to highly able students who possess technical scientific and/or creative skills related to fields of study in sciences, or arts and humanities (e.g. computer science, electronic engineering, physics, mathematics, psychology, cognitive science, human-computer interaction, ergonomics, design, media and communication, arts, music, film, photography, architecture, computational linguistics, and social science).

Applicants should demonstrate academic achievement at the level of a 2:1 or higher at undergraduate level in one of the above disciplines or a related discipline. Good 2:2 degrees are considered on an individual basis.

Applicants should have a clear aptitude for cross-disciplinary study and some programming or mathematical ability. Students will be able to develop complementary skills through the selection of specialist options.

IELTS requirements

6.5 overall including 6.0 in Writing, and 5.5 in Reading, Listening and Speaking.

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The programme will be managed and reviewed by the relevant EECs Teaching Group.

The Student-Staff Liaison Committee provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each cohort, together with appropriate representation from School staff. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Student-Staff Liaison Committees meet four times a year, twice in each teaching semester.

Each semester, students are invited to complete a web-based module questionnaire for each of their taught modules, and the results are fed back through the SSLC meetings. The results are also made available on the student intranet, as are the minutes of the SSLC meetings. Any actions necessary are taken forward by the relevant Senior Tutor, who chairs the SSLC, and general issues are discussed and actioned through the School's Learning and Teaching Committee.

The School's Learning and Teaching Committee advises the Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, including through student membership and consideration of student surveys and module questionnaires.

The School participates in the College's Annual Programme Review process, which supports strategic planning and operational issues for all undergraduate and taught postgraduate programmes. The APR includes consideration of the School's Taught Programmes Action Plan, which records progress on learning and teaching related actions on a rolling basis. Students' views are considered in the APR process through analysis of the NSS and module questionnaires, among other data.

Regular MAT forums and yearly MAT Away Days provide opportunities for students to give feedback to the MAT management team which takes it into account to enhance the programme.

What academic support is available?

A programme induction will be held in the first week of a student's attendance at QMUL. Students will be given information on the course, health and safety arrangements, and be introduced to the programme coordinator.

All students are assigned an academic advisor during induction week. The advisor's role is to guide their advisees in their academic development including module selection, and to provide first-line pastoral support. Every member of teaching staff holds open office hours during term-time. Additional academic support is provided to those students who are successful in securing an industrial-linked project.

Students will be supervised by academics within the EECS School for their MSc Projects.

Students elect a representative who is a member of the regular EECS SSLC meetings. Students can provide anonymous feedback on modules through the QMplus system.

The Language Centre at QMUL runs a wide range of in-sessionals modules which can help students to maximise their performance at university and improve the quality of their academic assignments (<https://www.qmul.ac.uk/slif/language-centre/in-sessionals/>). These modules are suitable to international students whose first language is not English. Home students who have English as their first language can also benefit from the academic skills that these modules develop.

The Language Centre also runs Pre-Sessional Summer/Autumn Programmes designed to develop English language and academic study skills, and prepare students for their chosen undergraduate or postgraduate degree at the University (<https://www.qmul.ac.uk/slif/language-centre/pre-sessional/>).

Programme-specific rules and facts

How inclusive is the programme for all students, including those with disabilities?

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum

Links with employers, placement opportunities and transferable skills

The School of Electronic Engineering and Computer Science has a wide range of industrial contacts secured through research projects and consultancy, our Industrial Experience programme, our Industrial Advisory Board, and our Centres for Doctoral Training.

The Industrial Advisory Board works to ensure that our courses are state of the art and match the changing requirements of the fast moving industry. The Board includes representatives from a variety of Electronic Engineering & Computer Science orientated companies ranging from SMEs to major blue-chips. These include: Microsoft Research, Royal Bank of Scotland, BT Labs, Oaklodge Consultancy, Intel Research, The Usability Company, Hewlett Packard Labs and Arclight Media Technology Limited.

The Media and Arts Technology programme External Advisory Board includes representatives from IBM, BBC R&D, UKRI EPSRC, the UK Department for International Trade, and Arts organisations.

The career opportunities for the graduates from this programme are in technology companies, start-ups, digital agencies, media companies, government agencies, health providers, consultancies, and academia. The technical modules will equip the graduates with the skills that are necessary to understand and to contribute to the modern arts and media sectors of the digital economy such as (interactive) media production, music industry, gaming, Internet, communications and consumer industries. Since the syllabus supports the development of research skills through specialist modules, some of the students can pursue in research or advisory positions, or choose to enroll in a PhD programme.

MSc in MAT graduates can take up roles including User Experience (UX) Researcher, Interaction Designer, Usability Specialist, Researcher, Information Architect, Data Scientist, Graphics, Media and Digital Designer, App Developer, and Creative Consultant.

Programme Specification Approval

Person completing Programme Specification:

Dr Mathieu Barthet

Person responsible for management of programme:

Dr Mathieu Barthet

Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:

18 February 2021

Date Programme Specification approved by Taught Programmes Board: