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 Sound and Music Computing
Name of interim award(s):	PG Certificate and PG Diploma
Duration of study / period of registration:	24 Months
Queen Mary programme code(s):	H6T4
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:
NA

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

Programme outline

This MSc provides interdisciplinary training in sound and music computing. The course offers specialist modules and projects in a wide range of areas including music signal processing, music informatics, music perception and cognition, data semantics and engineering, expressive musical performance and digital musical instruments, interfaces and effects. Modules on the AI and Music Data Science pathway also includes machine learning, AI, and deep learning for audio and music and computational creativity, while the Audio and Music Systems Engineering pathway includes sound recording and production techniques, music and audio programming and interactive systems design. You will graduate with an deep understanding of today's leading edge music technologies, with the potential to become a pioneer in developing future generations of technologies.

Aims of the programme

The overall aims are to provide students with training in advanced music and audio technologies, and in particular to give them the background and skills they need for careers in the technical aspects of audio production, audio engineering, and broadcasting, music informatics and information retrieval, music data science and related machine learning and AI techniques and other areas of sound and music computing. Specific aims include the completion of a broad range of advanced

study in methods of processing, analysis, synthesis and manipulation of musical signals and/or other music related data. This involves the use of both established and specialised data analysis and signal processing techniques, music perception and cognition, and basic data engineering and AI techniques in the field of audio and music.

What will you be expected to achieve?

Discipline-specific skills
• An understanding of the fundamentals of digital signal processing and of the techniques needed for real time digital signal processing
• An ability to use modern digital techniques for the analysis of sound, music, video and image transmission and processing
• An appreciation of the techniques underlying the use and transmission of multimedia images, voice and data
• An understanding of the general signal processing techniques appropriate to the processing of musical signals such as automatic music transcription, computational auditory scene analysis, and music information retrieval.
• An understanding of automatic music transcription, computational auditory scene analysis, and music information retrieval.
• A demonstration of the use of taught knowledge via the successful completion of a project in digital music processing or a cognate subject.
• An understanding of the human processing of sound and music, including the perception and cognition of musical sounds
• Knowledge of the algorithms for pattern recognition in audio and symbolic representations of music.
• Knowledge of the relative merits of the various modern approaches to signal processing of audio and music.
• An understanding of the statistical properties of sound and music.
• The ability to implement statistical approaches to the modeling and filtering of musical signal analysis.
• A general and theoretical understanding of musical signal analysis using the full range of statistical, intelligent and/or real-time
processing methods.
• An understanding of how audio is streamed, transmitted, or broadcast.
• An understanding of the role of audio and music in the context of a multimedia system.
• An understanding of how music processing fits into the greater scheme of multimedia processing.
• Knowledge of the standards bodies and standards used for audio and music.
• Knowledge of the copyright issues involved with music and its distribution.

Academic Content:	
A1	An ability to use modern digital techniques for the analysis of speech, music, video transmission and processing.
A2	An understanding of automatic music transcription, computational auditory scene analysis, and music information retrieval and other aspects of sound and music processing by humans and machines.
A3	The ability to implement statistical and rule-based approaches to musical analysis and synthesis.
A4	A general and theoretical understanding of musical analysis using the full range of statistical, intelligent and/or realtime processing methods
A5	An understanding of the human perception of music and ability to apply this understanding in empirical experiments and computational models.

Disciplinary Skills - able to:	
B1	Work independently on a practical or research-based project under supervision

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B2	Source, navigate, select, retrieve, evaluate, manipulate and manage information from a variety of sources
B3	Carry out extended critical and analytic writing through a dissertation on their research project.
B4	Take a practical approach to designing empirical experiments for testing hypotheses, including selection of appropriate methods, stimuli, participants, and methods for analysis.

Attributes:	
C1	Work independently on a practical or research-based project under supervision
C2	Analyse complex, novel and diverse situations, and identify appropriate methods of working and communicating
C3	Able to engage confidently with others in identifying and communicating problems, identifying goals and solutions and work with others and individually towardsa achieving them.

How will you learn?

Each non-project-based module normally involves lectures, problem solving coursework and practical sessions. Lectures are used to introduce principles and methods and also to illustrate how they can be applied in practice. Coursework allows students to develop their skills in problem solving and to gain practical experience. Practical sessions provide students with guidance and help while solving a problem. These lessons take the form of exercise classes and programming laboratories that allow the students to learn-by-doing in order to complement the lectures.

Individual projects are undertaken during the summer months under the supervision of an academic member of staff with whom there are normally weekly consultancy meetings. These are used for students to report on their progress, discuss research and design issues and plan their future work. This develops and reinforces students' ability to communicate technical ideas clearly and effectively. The Projects Coordinator also runs a thread of taught sessions to support the project module. A number of industrial-linked projects may be offered each year, which students can apply for.

How will you be assessed?

The assessment of taught modules normally consists of a combination of written examination and coursework.

The project is examined on the basis of a written report, a formal oral presentation, and, where applicable, a demonstration of any software and/or hardware developed by the student.

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.

Year 1

Semester 1: AI and Music Data Science Pathway - 4 Modules
ECS741P Music Perception and Cognition
ECS708P Machine Learning

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Semester 1: Audio and Music Systems Engineering Pathway - 4 Modules
ECS741P Music Perception and Cognition
ECS707P Fundamentals of DSP

Semester 2: AI and Music Data Science Pathway - 4 Modules
ECS7006P Music Informatics
ECS7013P Deep Learning for Audio & Music

Semester 2: Audio and Music Systems Engineering Pathway - 4 Modules
ECS7006P Music Informatics
ECS7012P Music and Audio Programming

Year 2:

Semester 1: AI and Music Data Science Pathway - 4 Modules
ECS759P Artificial Intelligence
ECS765P Big Data Processing

Semester 1: Audio and Music Systems Engineering Pathway - 4 Modules
ECS749P Sound Recording and Production Techniques
ECS742P Interactive Digital Multimedia Techniques

Semester 2: AI and Music Data Science Pathway - 4 Modules
ECS7022P Computational Creativity
ECS7028P Data Semantics

Semester 2: Audio and Music Systems Engineering Pathway - 4 Modules
ECS733P Interactive System Design
ECS7028P Data Semantics

Semester 3
(must take and pass)
ECS750P Project

Academic Year of Study   FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Fundamentals of DSP	ECS707P	15	7	Compulsory	1	Semester 1
Music Perception and Cognition	ECS741P	15	7	Compulsory	1	Semester 1

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Interactive Digital multimedia Techniques	ECS742P	15	7	Compulsory	2	Semester 1
Sound Recording and Production Techniques	ECS749P	15	7	Compulsory	2	Semester 1
Machine Learning	ECS708P	15	7	Compulsory	1	Semester 1
Big Data Processing	ECS765P	15	7	Compulsory	2	Semester 1
Music Informatics	ECS7006P	15	7	Compulsory	1	Semester 2
Music and Audio Programming	ECS7012P	15	7	Compulsory	1	Semester 2
Deep Learning for Audio and Music	ECS7013P	15	7	Compulsory	1	Semester 2
Interactive System Design	ECS733P	15	7	Compulsory	2	Semester 2
Data Semantics	ECS7028P	15	7	Compulsory	2	Semester 2
Computational Creativity	ECS7022P	15	7	Compulsory	2	Semester 2
Project Module	ECS750P	60	7	Core	2	Semester 3
Artificial Intelligence	ECS759P	15	7	Compulsory	2	Semester 1

What are the entry requirements?

Information on the entry requirements can be found at: www.qmul.ac.uk/postgraduate/taught/coursefinder/courses/sound-and-music-computing-msc/

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

The Student-Staff Liaison Committee (SSLC) 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. The SSLC 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

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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 Education Committee (EduComm).

The School's EduComm advises the Director of Education 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 University'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 Student Experience Action Plan, which records progress on learning and teaching related actions on a rolling basis. Students' views are considered in the APR process through module questionnaires, among other data.

What academic support is available?

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.

In addition, the School has a Senior Tutor for postgraduate students who provides second-line guidance and pastoral support for students, as well as advising staff on related matters.

Every member of teaching staff holds 2 open office hours per week during term-time.

Additional academic support is provided to those students who are successful in securing an industrial-linked project.

Programme-specific rules and facts

The programme adheres to the standard Academic Regulations for taught postgraduate programmes.

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 & Computer Science has a wide range of industrial contacts secured through research

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projects and consultancy, our Industrial Experience programme and our Industry Panel.
The Industry Panel works to ensure that our courses are state of the art and match the changing requirements of this fast moving industry. The Panel includes representatives from a variety of Computer Science oriented 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

Recent graduates have found employment as programmers, Data Scientists, Systems Analysts, Software Engineers, database developers, IT consultants and web developers with well known multinational companies throughout the UK and Europe, the Americas and Asia. Merril Lynch, Microsoft, Nokia, Barclays Capital, Logica, JPMorgan, Bear Sterns, Apple, Google, Spotify, and the BBC are among the organizations that have recently employed graduates of EECS programs.

Programme Specification Approval

Person completing Programme Specification:

George Fazekas

Person responsible for management of programme:

George Fazekas

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

21 Nov 2023

Date Programme Specification approved by Taught Programmes Board:

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