Programme Specification[1]

1. Programme Title(s) and Code(s):

Programme Title	UCAS Code	GU Code
BEng Electronics with Music	HH56	H6W3-2200

2. Academic Session:

2018-19

3. SCQF Level (see **Scottish Credit and Qualifications Framework Levels**):

10

4. Credits:

480

5. Entrance Requirements:

Please refer to the current undergraduate prospectus at: http://www.gla.ac.uk/undergraduate/prospectus/

6. ATAS Certificate Requirement (see **Academic Technology Approval Scheme**):

ATAS Certificate not required

7. Attendance Type:

Full Time

8. Programme Aims:

Electronics touches all aspects of contemporary life, having spawned the computer revolution, the networked world, and the modern entertainment industries. Electronic Engineers are crucial to systems which create, process and broadcast information, including audio and other media. This degree provides an opportunity to combine musical interests with a thorough study of modern electronics. Graduates, as fully qualified engineers, may choose from a broad range of employment options, from the recording and broadcast industries, to planning wide area telecommunications networks (using wireless, fibre optic and satellite links), and even the design of future medical devices or hand-held computing equipment. About one third of the curriculum, given by

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[1] This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each course can be found in course handbooks and other programme documentation and online at www.gla.ac.uk/

The accuracy of the information in this document is reviewed periodically by the University and may be checked by the Quality Assurance Agency for Higher Education.

the School of Culture and Creative Arts, includes music history and repertoire, studio techniques, and modern methods of audio signal synthesis, processing and control.

This degree programme aims to:
- present an integrated in depth multidisciplinary programme of study which will provide the student with knowledge and understanding of Electronics with Music;
- provide opportunities for the student to study some specialist topics within the field of Electronics with Music;
- provide an opportunity for students to develop transferable problem solving skills in Electronics with Music and individual project work;
- provide technical awareness in appropriate specialist applications of technology in the Electronics with Music field;
- develop the student's mathematical rigour, accuracy and numerate skills appropriate for professional engineering;
- present some professional, ethical, economic and management issues relevant to the Electronics with Music industry.

9. Intended Learning Outcomes of Programme:

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas.

Knowledge and Understanding:

Graduates will be able to:
- Use their knowledge and understanding of the appropriate mathematical, scientific and computational tools that underpin Electronics with Music, to solve analytical, design or theoretical problems in the field of Electronics with Music;
- Apply their knowledge and understanding of physical laws, mathematics, numerical analysis and other relevant information in order to model Electronics with Music and similar systems;
- Draw on materials from a range of courses and wider reading in Electronics with Music principles and in related disciplines in order to solve problems in engineering;
- Apply some business and management techniques that are relevant to Electronics with Music and Electronics with Music Engineers;
- Consider the role of Electronics with Music Engineers in society and the constraints within which their engineering judgement will be exercised;
- Consider the professional and ethical responsibilities of Electronics with Music Engineers;
- Consider the national and international role of the Electronics with Music Engineer and the impact of engineering solutions in a global context.

Skills and Other Attributes:

Graduates will be able to:

Subject-specific/practical skills
- Plan and execute safely a series of experiments in Electronics with Music;
- Design, from requirement, market need or specification, an Electronics with Music device or system, up to the preliminary design stage, and present this design via a series of poster, written and oral presentations;
- Use laboratory and workshop equipment to generate data from Electronics with Music systems with appropriate rigour;
- Analyse experimental results in depth and determine their strength and validity;
- Assess the safety and potential efficacy of a device or system;
- Prepare technical drawings and technical reports;
- Give in depth technical presentations in oral form, as posters or in written form;
- Write up experimental methods, results and conclusions, and carefully and clearly plot experimental or computational results and interpret experimental data by the use of regression, curve fitting and filtering, applying appropriate statistical analysis;
- Use scientific literature effectively and by drawing on their knowledge from lectures and wider reading around the subject be able to solve some Electronics with Music problems;
- Develop and adjust a work programme in order to conduct a research project;
- Undertake a supervised research project in academia or industry and present the results of this work in a written report and oral presentation to peers and staff;

- Work effectively in both individual and group projects;
- Explain some of the managerial and economic factors facing a professional engineer;
- Document their solutions to engineering problems so that others can follow and validate their work;
- Apply professional engineering practice and judgement in project work;
- Write computer programs and use computational tools and packages, selecting the appropriate "state of the art" tools to solve engineering problems.

Intellectual skills
Graduates will be able to:
- Apply appropriate quantitative mathematical, scientific and engineering tools to the analysis of problems;
- Apply rigour in mathematics;
- Plan, conduct and report a programme of research;
- Analyse and solve engineering problems;
- Design a system, component or process to meet a need;
- Integrate knowledge and understanding of other scientific, mathematical, computational or engineering disciplines in order to support their engineering specialisation;
- Formulate and test hypotheses;
- Evaluate designs, processes and products and make improvements;
- Integrate and evaluate information and data from certain sources;
- Take a holistic approach in solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact.

Transferable/key skills
The skill set of the Electronics with Music Engineer graduating from the BEng programme will be of use in a wide range of applications because of the multi-disciplinary nature of the subject. Their skills will be, by definition, transferable.

Graduates will be able to:
- Apply problem solving and analytical thinking to a range of problems;
- Demonstrate numeracy and literacy in written reports, project work and examinations;
- Work in a group project environment and contribute effectively to the group project;
- Work on an individual project involving some self-directed research;
- Communicate effectively (in writing, verbally and through drawings);
- Apply mathematic skills (algebra, geometry, modelling, analysis);
- Transfer techniques and solutions from one field of engineering to another and to the Electronics with Music field;
- Use information and communications technology;
- Manage resources and time effectively;
- Learn independently in familiar surroundings with open-mindedness and in the spirit of enquiry;
- Learn effectively for the purpose of continuing professional development throughout their career.

10. Typical Learning and Teaching Approaches:

Staff involved in the degree programme utilise a wide range of teaching methods that they deem the most appropriate for a particular course. These include:
- Lectures;
- External lectures from industry or clinicians;
- Feedback given to students during tutorials;
- Small group and large group tutorial sessions;
- Question and answer sessions during lectures or staff Office Hours;
- Guided reading of texts, journal articles etc., for individual and group projects;
- Completion of web-based exercises or computer based laboratory sessions;
- Laboratory sessions.

11. Typical Assessment Methods:

Assessment Methods to be used are:
- Written examinations (Summative assessment);
- Oral presentations of individual and group work;
- Individual written project report(s) of both individual and group projects;
- Group written project report(s) of group projects;
- Interview of group project manager and assessment of group project minutes;
- Poster presentation of group project work;
- Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
- Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
- Presentation skills through group presentations and poster presentations.

12. Programme Structure and Features:

BEng   H6W3-2200

MEng Year 1
Compulsory Courses

Course Code	Course	Credits	Semester
ENG1021	Electronic Engineering 1X	20	1
ENG1022	Electronic Engineering 1Y	20	2
ENG1063	Engineering Mathematics 1	40	1 & 2
MUSIC1001	Listening and Repertory	20	1 & 2
		100	

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
MUSIC1003	Musicianship	20	1 & 2
MUSIC1005	Performance Level 1 (Foundation)	20	1 & 2

MEng Year 2
Compulsory Courses

Course Code	Course	Credits	Semester
ENG2004	Analogue Electronics 2	10	2
ENG2020	Digital Electronics 2	10	1
ENG2023	Electrical Circuits 2	10	1
ENG2025	Electronic Design Project 2	10	2
ENG2029	Embedded Processors 2	10	2
ENG2031	Engineering Electromagnetics 2	10	2
ENG2083	Introductory Programming 2	10	1
ENG2086	Engineering Mathematics 2	20	1
MUSIC2022	Sonic Arts: Interacting with Sound	20	1 & 2
		110	

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
MUSIC2001	Aesthetics and Philosophy of Music (APM)	20	1 or 2
MUSIC2002	Analysis, Intermediate	20	1 (Alt Years)
MUSIC2003	Aspects of Modernity (Engineering)	20	2 (Alt Years)
MUSIC2004	Bach and the Lutheran Passion	20	1 (Alt Years)
MUSIC2005	Composition, Intermediate	20	1 & 2
MUSIC2006	Musical Techniques, Foundation (MA/BEng)	20	1 & 2
MUSIC2008	Opera	20	2 (Alt Years)
MUSIC2009	Performance Level 2 (Intermediate)	20	1 & 2

MEng Year 3

Compulsory Courses

Course Code	Course	Credits	Semester
ENG3014	Communication Systems 3	10	1
ENG3015	Control EE3	10	2
ENG3023	Electromagnetic Compatibility 3	10	2
ENG3026	Electronic System Design 3	10	1
ENG3027	Engineering Career Skills 3	10	1 & 2
ENG3029	Engineering Mathematics EE3	10	1
ENG3043	Real Time Computer Systems 3	10	1
MUSIC4054	Sonic Arts: Sound and Image	20	1 & 2
		90	

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
ENG3008	Audio and Video Processing 3	10	2
ENG3016	Data Acquisition for Music Processing 3	10	1
MUSIC2006	Musical Techniques, Foundation (MA/BEng)	20	1 & 2
MUSIC4001	Aesthetics and Philosophy of Music (MA/BEng Hons)	20	1 or 2
MUSIC4002	Analysis, Intermediate	20	1 (Alt Years)
MUSIC4003	Aspects Of Modernity (Arts)	30	1
MUSIC4004	Bach And The Lutheran Passion (MA/BEng Hons)	20	1 (Alt Years)
MUSIC4007	Composition, Advanced	30	1 & 2
MUSIC4010	Composition, Higher (BEng)	20	1 & 2
MUSIC4011	Composition, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4012	Contemporary Music Ensemble	30	1 & 2
MUSIC4013P	Dissertation	30	1 & 2
MUSIC4018	Historiography & Criticism (Honours)	30	1
MUSIC4020	Musical Techniques, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4021	Notation	30	1 & 2
MUSIC4022	Opera (MA/BEng/BMus Hons)	20	2 (Alt Years)
MUSIC4024	Performance Higher (BEng)	20	1 & 2
MUSIC4026	Performance, Advanced (BEng)	20	1 & 2
MUSIC4029	Performance, Intermediate (MA)	20	1 & 2
MUSIC4035	The Music of Scotland	30	1 (Alt Years)
MUSIC4047	Film Music	30	2 (Alt Years)

Optional Courses (choose 10 credits)

Course Code	Course	Credits	Semester
ENG3009	Audio and Video Team Project 3	10	1 & 2
ENG3049	Team Design Project EE3	10	1 & 2

MEng Year 4

Compulsory Courses

Course Code	Course	Credits	Semester
ENG4001	Acoustics and Audio Technology 4	20	1
ENG4085	Integrated System Design Project 4	20	1 & 2
ENG4172	Team Project EE4	20	1 & 2
		60	

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
ENG4036	Biosensors and Diagnostics 4	10	2
ENG4040	Computer Architecture and Communications 4	20	2
ENG4042	Control 4	20	1
ENG4052	Digital Communication 4	20	1
ENG4053	Digital Signal Processing 4	20	1
ENG4099	Microwave Electronic and Optoelectronic Devices 4	20	2

ENG4100	Microwaves and Optical Transmission Systems 4	20	2
ENG4104	Power Systems 4	20	2
ENG4118	Robotics 4	20	2
ENG4138	VLSI Design 4	20	1
ENG4181	Cellular Biophysics 4	10	1
ENG4184	Navigation Systems 4	10	1
ENG4185	Radar and Electro-Optic Systems 4	10	2
ENG4187	Power Electronics and Drives 4	20	1

Optional Courses (choose 40 credits)

Course Code	Course	Credits	Semester
ENG4028	Audio Programming and Signal Processing 4	20	1 & 2
MUSIC4001	Aesthetics and Philosophy of Music (MA/BEng Hons)	20	1 or 2
MUSIC4002	Analysis, Intermediate	20	1 (Alt Years)
MUSIC4003	Aspects Of Modernity (Arts)	30	1
MUSIC4004	Bach And The Lutheran Passion (MA/BEng Hons)	20	1 (Alt Years)
MUSIC4007	Composition, Advanced	30	1 & 2
MUSIC4010	Composition, Higher (BEng)	20	1 & 2
MUSIC4011	Composition, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4012	Contemporary Music Ensemble	30	1 & 2
MUSIC4013P	Dissertation	30	1 & 2
MUSIC4018	Historiography & Criticism (Honours)	30	1
MUSIC4020	Musical Techniques, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4021	Notation	30	1 & 2
MUSIC4022	Opera (MA/BEng/BMus Hons)	20	2 (Alt Years)
MUSIC4024	Performance Higher (BEng)	20	1 & 2
MUSIC4026	Performance, Advanced (BEng)	20	1 & 2
MUSIC4029	Performance, Intermediate (MA)	20	1 & 2
MUSIC4035	The Music of Scotland	30	1 (Alt Years)
MUSIC4047	Film Music	30	2 (Alt Years)
MUSIC4051	Sonic Arts: Creative Projects	20	1 & 2

MEng Year 5
Compulsory Courses

Course Code	Course	Credits	Semester
ENG5026	Design Special Topic 5	20	2
ENG5041P	Individual Project 5	60	1
		80	

Optional Courses (choose 40 credits)

Course Code	Course	Credits	Semester
ENG5009	Robust Control 5	10	2
ENG5021	Computer Communications II (LANs)	10	2
ENG5048	Introduction to Wind Engineering	10	2
ENG5055	Micro and Nano Technology	20	2
ENG5056	Microwave and mm Wave Circuit Design	20	2
ENG5066	Optical Communications	20	2
ENG5220	Real Time Embedded Programming	20	2
ENG5250	Energy Conversion Systems M	10	2
ENG5261	Microwave, Electronic & Optoelectronic Devices M	10	2
ENG5279	Energy from Waste M	10	2

BEng Years 1 to 3
As MEng

BEng Year 4

Compulsory Courses

Course Code	Course	Credits	Semester
ENG4001	Acoustics and Audio Technology 4	20	1
ENG4028	Audio Programming and Signal Processing 4	20	1 & 2
ENG4078P	Individual Project EE4	40	1 & 2
		80	

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
ENG4001	Acoustics and Audio Technology 4	20	1
ENG4036	Biosensors and Diagnostics 4	10	2
ENG4040	Computer Architecture and Communications 4	20	2
ENG4042	Control 4	20	1
ENG4052	Digital Communication 4	20	1
ENG4053	Digital Signal Processing 4	20	1
ENG4099	Microwave Electronic and Optoelectronic Devices 4	20	2
ENG4100	Microwaves and Optical Transmission Systems 4	20	2
ENG4104	Power Systems 4	20	2
ENG4118	Robotics 4	20	2
ENG4138	VLSI Design 4	20	1
ENG4181	Cellular Biophysics 4	10	1
ENG4184	Navigation Systems 4	10	1
ENG4185	Radar and Electro-Optic Systems 4	10	2
ENG4187	Power Electronics and Drives 4	20	1

Optional Courses (choose 20 credits)

Course Code	Course	Credits	Semester
ENG4028	Audio Programming and Signal Processing 4	20	1 & 2
MUSIC4001	Aesthetics and Philosophy of Music (MA/BEng Hons)	20	1 or 2
MUSIC4002	Analysis, Intermediate	20	1 (Alt Years)
MUSIC4003	Aspects Of Modernity (Arts)	30	1
MUSIC4004	Bach And The Lutheran Passion (MA/BEng Hons)	20	1 (Alt Years)
MUSIC4007	Composition, Advanced	30	1 & 2
MUSIC4010	Composition, Higher (BEng)	20	1 & 2
MUSIC4011	Composition, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4012	Contemporary Music Ensemble	30	1 & 2
MUSIC4013P	Dissertation	30	1 & 2
MUSIC4018	Historiography & Criticism (Honours)	30	1
MUSIC4020	Musical Techniques, Intermediate (MA/BEng Hons)	20	1 & 2
MUSIC4021	Notation	30	1 & 2
MUSIC4022	Opera (MA/BEng/BMus Hons)	20	2 (Alt Years)
MUSIC4024	Performance Higher (BEng)	20	1 & 2
MUSIC4026	Performance, Advanced (BEng)	20	1 & 2
MUSIC4029	Performance, Intermediate (MA)	20	1 & 2
MUSIC4035	The Music of Scotland	30	1 (Alt Years)
MUSIC4047	Film Music	30	2 (Alt Years)

Regulations

This programme will be governed by the relevant regulations published in the University Calendar. These regulations include the requirements in relation to:

(a) Award of the degree
(b) Progress
(c) Early exit awards

http://www.gla.ac.uk/services/senateoffice/calendar/

13. Programme Accredited By:

Accredited by the Institution of Engineering and Technology (IET) to CEng level with further learning required.

14. Location(s):

Glasgow

15. College:

College of Science and Engineering

16. Lead School/Institute:

Engineering [REG30300000]

17. Is this programme collaborative with another institution:

No

18. Awarding Institution(s):

University of Glasgow

19. Teaching Institution(s):

University of Glasgow

20. Language of Instruction:

English

21. Language of Assessment:

English

22. Relevant QAA Subject Benchmark Statements (see [Quality Assurance Agency for Higher Education](#)) and Other External or Internal Reference Points:

This Programme Specification is informed by the QAA Benchmark Statement for Engineering

http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf

It is also informed by the Engineering Council Publication "UK Standard for Professional Engineering Competence (UK-SPEC)"

http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC third edition (1).pdf

and the requirements of the Institution of Engineering and Technology (http://www.theiet.org/)

23. Additional Relevant Information (if applicable):

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such LEADS (www.gla.ac.uk/myglasgow/leads/), Counselling & Psychological Services (www.gla.ac.uk/services/counselling/), the Disability Service (www.gla.ac.uk/services/studentdisability/) and the Careers Service (www.gla.ac.uk/services/careers/).

24. Online Learning:

No

25. Date of approval:	