MUSIC
as part of your degree

Electronic Music

MU2004

2018/19

Please read in conjunction with the Departmental Handbook
MU2004

Electronic Music

Module Overview

This is a practical module offering students the opportunity to work in small groups in the Music Centre's studio to create music from electronic sources. Accompanying lectures and seminars examine the history of electronic music, amplified music and computer music and look at works by significant composers and innovators who have worked in these genres, from Stockhausen to Jimi Hendrix. The module also offers tuition in the music software package *Reaper*. No prior experience in electronic music is necessary in order to take the module, but some knowledge of music notation or music theory would be advantageous.

Aims

- To develop a familiarity with *Reaper* software for composition, recording and mastering music
- To enable the development of coherent educational Podcasts
- To develop an awareness of, and ability to discuss in detail the history and development of music technology and composers of electronic music

Key Reading For The Module


Module convener: Dr Jonathan Kemp (jk50). Please address problems to him.

Lecturers: Dr Jonathan Kemp (jk50), Dr Michael Ferguson (mcjf)

Semester: 2

Credits: 20

Teaching: 1 lecture, 1 seminar, 1 practical class and 1 fortnightly tutorial

Class hour: 2.00pm, Monday, Thursday and Friday in the Arts Building, Seminar Room 7

Tutorials: Tutorial attendance is compulsory: If more than two tutorials are missed then this will lead to a 0X grade for the module. Students should also sign up during week 1 for a tutorial time using the “Tutorial Signup” tool in MMS. The tutorial sessions will take place fortnightly, starting in week 2 and with the final sessions in week 10. These sessions take place in the Music Studio, upstairs and to the left in the Younger Hall.

Seminars: Attendance at the Thursday seminars is compulsory. The usual attendance rules for compulsory sessions apply as set out in the Music Departmental Handbook.

Course assessment: Continuous Assessment = 100%

Re-Assessment: Continuous Assessment = 70% One and a half hour examination = 30%
LECTURES

STRAND 1: LECTURE
TECHNOLOGIES AND POPULAR MUSIC

Class hour: 2pm Monday.

In this strand of lectures we explore the development of electronic technologies that relate to music and discuss their use in popular styles. We begin with a discussion of audio recording using discs and magnetic tape. After this point early electronic instruments such as the Theremin and Ondes Martenot are introduced. This leads onto instruments using the magnetic pickup: the Hammond Organ and the Electric Guitar. The development of sound synthesisers is covered with separate lectures on analogue and digital synthesis methods. The strand concludes with a discussion on the use of computers in music and the music business today.

STRAND 2: SEMINAR
SET WORKS

Class hour: 2pm Thursday.

Attendance is taken for this seminar strand that begins with a session on the nature of human perception of sound in order to give the context to the understanding of electronic music in general and sound synthesis in particular. Two seminars give an introduction to the music of the 20th century, touching on topics such as Edgard Varèse’s concept of organised sound. Seven seminars on each of the course Set Works form the main part of this strand:

- Karlheinz Stockhausen – Gesang der Jünglinge (1956)
- Steve Reich – Come Out (1966)
- The Beatles – A Day In The Life (1967)
- Jimi Hendrix – Star Spangled Banner (1969)
- Iannis Xenakis – Mycenae-Alpha (1978)
- Holly Herndon – Chorus (2015)

STRAND 3: PRACTICAL
USING TECHNOLOGY

Class hour: 2pm Friday.

In this strand of lectures the techniques used in contemporary music making are demonstrated. The primary focus is on software for recording, programming and manipulating audio and control information: Reaper. The techniques introduced in these sessions mirror those implemented in the tutorial sessions.
### TIMETABLE

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Monday - Technology &amp; Pop</th>
<th>Thursday - Set Works</th>
<th>Friday - Using Technology</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>28/1/19</td>
<td>Introduction</td>
<td>Psychoacoustics</td>
<td>Using Reaper - Introduction</td>
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<td>Week 2</td>
<td>4/2/19</td>
<td>Martenot/Theremin/Hammond Organ</td>
<td>20th Century Music</td>
<td>Using Reaper - Sequencing</td>
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<tr>
<td>Week 3</td>
<td>11/2/19</td>
<td>Disc/Tape</td>
<td>20th Century Music</td>
<td>How to Podcast and Rendering</td>
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<td>Week 4</td>
<td>18/2/19</td>
<td>Subtractive Analogue Synthesis</td>
<td>Karlheinz Stockhausen – Gesang der Jünglinge</td>
<td>Chord Based Composition</td>
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<td>Week 5</td>
<td>25/2/19</td>
<td>Digital Music Hardware</td>
<td>Steve Reich – Come Out</td>
<td>Using Reaper - EQ, Takes and Sampling</td>
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<td>(with Podcast due Fri 1/3/19)</td>
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<td>Week 6</td>
<td>4/3/19</td>
<td>Mathews, Risset, Ghent &amp; Chowning</td>
<td>The Beatles – A Day In The Life</td>
<td>Producing &amp; Remixing Q&amp;A (DB)</td>
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<td>Week 7</td>
<td>11/3/19</td>
<td>Electric Guitar</td>
<td>Jimi Hendrix – Star Spangled Banner</td>
<td>Using Reaper - Effects</td>
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<td>Spring Break</td>
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<td>Week 8</td>
<td>1/4/19</td>
<td>Form</td>
<td>Iannis Xenakis – Mycenae-Alpha</td>
<td>Side Chaining and Controllers</td>
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<td>(with Remix due Fri 5/4/19)</td>
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<td>Week 9</td>
<td>8/4/19</td>
<td>Music Software</td>
<td>Jonathan Harvey – Mortuos Plango, Vivos Voco</td>
<td>Pitch &amp; Timing Correction and Guitar FX</td>
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<td>Week 10</td>
<td>15/4/19</td>
<td>The Music Business</td>
<td>Holly Herndon – Chorus</td>
<td>Studio Class Hour</td>
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<td>(with Take-Home Test Thurs 18/4/19 - Fri 19/4/19)</td>
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<td>Week 11</td>
<td>22/4/19</td>
<td>Studio Class Hour</td>
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<td>(with composition due on 3/5/19 which is the Friday of Week 12)</td>
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Black: Jonathan Kemp  
Green: Michael Ferguson  
Orange: Optional drop-in clinic for help with composition
The submission deadline for the Podcast is 11:59 pm on Friday the 1st of March 2019. Podcasts should be submitted as an MP3 file in the MMS system. The Podcasts created will take the form of a 10 to 15 minute long educational introduction to a specific software or hardware musical instrument covering the following areas:

- The history of the instrument (including the hardware that inspired software where appropriate)
- Demonstrations of the basic sounds it can make (sine wave? square wave? samples? etc. where appropriate)
- Demonstrations of the filtering, voicing and modulation options (filter sweeps, vibrato etc. where appropriate)
- Demonstration of polyphony and note triggering (monophonic? built in sequencer? polyphonic? etc. where appropriate)
- Demonstration of the instrument used within a short extract from a musical composition (yours or otherwise)

These Podcasts will not be released to the general public, but will be loaded into the MMS system and contributes 20% to the final mark for the course. A lecture in week 3 of the semester will explain how to create your Podcast. Students are expected to work on a Podcast each, and choose a specific instrument from the following list:

One of the studio’s hardware instruments:
- Moog Etherwave Theremin
- Roland Juno 106

or one of the following software instruments available in the studio through Reaper:
- OB-Xd (Oberheim analogue subtractive synth emulation): [https://obxd.wordpress.com/](https://obxd.wordpress.com/)
- Dexed (FM Synth Yamaha DX7 emulation) [https://asb2m10.github.io/dexed/](https://asb2m10.github.io/dexed/)
- AZR3 (Hammond Organ emulation) [https://blog.wavosaur.com/tag/organ/](https://blog.wavosaur.com/tag/organ/)
- TYRELL N6 (Analogue subtractive synth emulation) [https://www.amazona.de/amazona-de-freeware-tyrell-n6-synth/](https://www.amazona.de/amazona-de-freeware-tyrell-n6-synth/)
- TAL-NoiseMaker (Subtractive analogue synth emulation) [https://tal-software.com/products/tal-noisemaker](https://tal-software.com/products/tal-noisemaker)

Marking will be based on clarity of presentation, the ability to give a convincing demonstration of the way in which sounds can be created and edited using the instrument and the way it can be used within a passage of electronic music.
REMIX

The submission deadline is 4:00 pm on Friday the 5th of April 2019. This should be handed in to the Music Centre office in the Younger Hall on North Street.

You will compose a piece of music making significant use of a sample or samples taken from one of the course Set Works. The remix should last between 3 and 4 minutes in any style from popular to avant-garde. This will be submitted on a USB pen drive in a sealed envelope with your enrolment number clearly written on the front, which must contain the following:

- A full audio mixdown of your composition incorporating both audio recordings and synthesised sounds.
- The “Reaper Project Folder” for your composition. Please note that all projects must open without error on the studio computers (so tracks using soft-synths not found in the studio will not be accepted).

The remix contributes 20% towards the final mark for the course. Any USB pen drives submitted may be returned by arrangement with the module coordinator after the marks for the assignment have been released.

MARKING CRITERIA

The pieces are marked with equal weighting to the musical and technical aspects.

Pieces are only awarded a first class mark for the technical aspect of the work if:

- The piece has at least 6 well labelled tracks.
- The piece lasts between 3 and 4 minutes.
- Effects and panning are used.
- The files on the submission pen drive are clearly presented.

Pieces are only awarded a first class mark for the musical aspect of the work if:

- The piece has contrasting sections.
- The piece holds the listener’s interest and is musically rewarding.
- The structure of the composition and the timbres and textures created are complex.
- Creative and significant use is made of the sample or samples taken from one of the course Set Works

For details of penalties for late submissions please refer to the Music Departmental Handbook which can be accessed in the MMS system.
ELECTRONIC COMPOSITION

The submission deadline for the electronic composition is 4:00pm on Friday the 3rd of May 2019. This should be handed in to the Music Centre office in the Younger Hall on North Street.

You will compose a piece of music lasting between 3 and 5 minutes in any style from popular to avant-garde. This will be submitted on a USB pen drive in a sealed envelope with your enrolment number clearly written on the front, which must contain containing the following:

- A full audio mixdown of your composition incorporating both audio recordings and synthesised sounds.
- The “Reaper Folder” for your composition. Please note that all projects must open without error on the studio computers (so tracks using soft-synths not found in the studio will not be accepted).

The electronic composition submission contributes 40% of the final mark for the course. Any USB pen drives submitted may be returned by arrangement with the module coordinator after the marks for the assignment have been released.

MARKING CRITERIA

The pieces are marked with equal weighting to the musical and technical aspects.

Pieces are only awarded a first class mark for the technical aspect of the work if:

- The piece has at least 6 well-labelled tracks.
- The piece lasts between 3 and 5 minutes.
- Effects and panning are used.
- The files on the submission drive are clearly presented.

Pieces are only awarded a first class mark for the musical aspect of the work if:

- The piece has contrasting sections.
- The piece holds the listener’s interest and is musically rewarding.
- The structure of the composition and the timbres and textures created are complex.

For details of penalties for late submissions please refer to the Music Departmental Handbook which can be accessed in the MMS system.
REMIX/COMPOSITION MARKING SCHEME

Technical Aspect:

17-20. Has at least 6 well-labelled tracks. The piece lasts for between 3 and 5 minutes. Effects, panning and automation are used effectively. Files are all clearly presented on the drive so that the full audio mixdown can be listened to and the Reaper Folder opened and played successfully.

14-16. Has at least 6 well-labelled tracks. The piece lasts for between 3 and 5 minutes. Effects and panning are used effectively. The full audio mixdown can be listened to successfully. Files may be less than clearly presented on the drive or the Reaper Folder opens but cannot locate all the audio recordings required for successful playback without editing.

11-13. Has at least 6 well-labelled tracks. The piece lasts for between 3 and 5 minutes. Effects and panning are used to some extent. The full audio mixdown can be listened to successfully. Files are not clearly presented on the drive or the Reaper Folder opens but cannot playback successfully due to missing audio files.

7-10. Piece not clearly presented due to a lack of named tracks and/or wrong tracks muted and/or piece of the wrong length. The full audio mixdown contains errors meaning that re-editing is required for listening.

0-6. Full audio mixdown contains errors meaning that re-editing is required for listening but project cannot be opened to allow re-editing.

Musical Aspect:

17-20. The piece has contrasting sections, holds the listeners interest and is musically rewarding. Both the structure of the composition and the timbres and texture created are complex.

14-16. The piece has contrasting sections and is musically rewarding overall but has a small element of repetition or a lack of originality or uniformity of timbre to the point where interest suffers somewhat.

11-13. The piece has contrasting sections but is lacking in at least two ways in that there is a small element of repetition or a lack of originality or uniformity of timbre.

7-10. The piece is considered musically satisfying only for a few bars. It has no contrasting sections and is lacking in terms of originally and texture.

0-6. The piece is not considered musically satisfying at any stage and is lacking in terms of contrasting sections and originality and texture.
**TAKE-HOME TEST**

You will select one topic from each of two sections. The 24 hour Take-Home Test contributes 20% towards the final mark for the course. This test will be held between 5:00 pm on Thursday the 18th of April and 5:00pm on Friday the 19th of April 2019 with the question paper posted to MMS at 5:00pm on the Thursday of the test. Answer submissions should be uploaded as a word document format using the MMS system with the deadline being 5:00pm on the Friday of the test.

Late submissions will receive a mark of 0. Submitting work for the class test is a requirement for passing the module.

The examination will be based on the material covered in the Strand 1 and Strand 2 lectures. This test should take on average about 1 hour to complete assuming normal consolidation of lecture material through the semester, so should be able to be fitted within your scheduled obligations over this period.

The assessment criteria for the test are based on your ability to:

1. Show detailed knowledge of a relevant body of information.
2. Develop and argue in favour of your own hypotheses using your ability to analyse material in order to support your argument.
RESOURCES AND THE STUDIO

Studio Bookings:

It is vital that everyone works consistently on this module throughout the semester in order to ensure that 200 hours of effort are achieved on the module overall. This will help ensure that everyone is not trying to use the same resources at the same time and that bookings are respected. Part of this involves that setting out rules concerning bookings to ensure that they are not occupying unreasonable amounts of time.

Please limit your bookings to:
- Maximum of one hour per person per day for booking the entire room
- Maximum of four hours per person per day for booking a single computer

Sign out the key from the Music Centre Office when you arrive for your booking. Leave the room locked at all times, even if popping out of the room for a moment. Be aware of the times when the Music Centre Office is closing and return (and sign back in) the studio door key to the Music Centre Office by that time. [http://www.st-andrews.ac.uk/music/openingtimes/](http://www.st-andrews.ac.uk/music/openingtimes/)

Always leave promptly if you are using a computer that has been booked by another studio user. Feel free to swap audio equipment between different computers in the room but return the room to leave it exactly as you found it. Do not remove or borrow anything by taking it outside the studio. If a studio computer Bluetooth QWERTY keyboard or Bluetooth mouse stops working due to exhausted batteries then borrow a USB equivalent from the table in the studio and email me to make me aware of the problem so I can change the batteries.

Any problems please email: jk50@st-andrews.ac.uk

Key Reading:


Full Resource List: