

DEPARTMENT OF MUSIC



University of
St Andrews

600
YEARS

MUSIC

as part of your degree

Electronic Music

MU2004

20011/12

Please read in conjunction with the Departmental Handbook

LECTURES

STRAND 1 **TECHNOLOGIES AND POPULAR MUSIC**

Class hour: 9am 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 **THE COMPOSERS**

Class hour: 9am Wednesday.

In this strand of lectures we examine the composers of “serious” or “art” electronic and computer music. The initial innovators in using technology for the creation of new music (rather than attempting to faithfully reproduce conventional music) are discussed. We begin with a discussion of the nature of human perception of sound in order to give the context to the discussion. The work of Varèse gives us an introduction to the aims of “organised sound”. This leads on to the 1950s and the distinct styles of Musique Concrete (where we focus on the work of Pierre Schaeffer) and Elektronische Musik (where we focus on the work of Karlheinz Stockhausen). Next the pioneers of machine automation and mathematics in music, Iannis Xenakis and Milton Babbitt are discussed. The inclusion of real time feedback between ensembles and electronics as pioneered by Pierre Boulez will be addressed. John Chowning provides the pioneering work in digital synthesis. Finally the work of the contemporary composer Jonathan Harvey is analysed.

STRAND 3 **USING TECHNOLOGY**

Class hour: 9am Thursday.

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: Apple Logic and Ableton Live. Sibelius music scoring software is also introduced. The techniques introduced in these sessions mirror those implemented in the Practical sessions of the following week.

TIMETABLE

	Monday - Technology & Pop	Wednesday - Composers	Thursday - Using Technology
Week 1 (26/9/11)	Introduction	Psychoacoustics	Introduction to Apple Logic
Week 2 (3/10/11)	Martenot/Theremin	Varèse	Introduction to Ableton Live
Week 3 (10/10/11)	Disc/Tape	Schaeffer	How to Podcast
Week 4 (17/10/11)	Hammond Organ	Stockhausen	Using Synths and Samplers
Week 5 (24/10/11)	Electric Guitar	Babbitt	Introduction to Sibelius
Week 6 (31/10/11)	RCA/Moog	Xenakis	Using Effects
Week 7 (7/11/11)	Reading Week	Reading Week	Reading Week
Week 8 (14/11/11)	Digital Synthesis	Boulez	Mixing/Mastering
Week 9 (21/11/11)	Raisin Monday	Chowning	Laptop Improvisation
Week 10 (28/11/11)	Music Software	No Teaching	Class Test
Week 11 (5/12/11)	Music Business	Harvey	Controllers and DJing
Week 12 (12/12/11)	Studio Class Hour	Studio Class Hour	Distribution

Black: Dr. Jonathan Kemp (jk50)

Green: Dr. Michael Downes (mjd14)

Blue: Dr. Pippa Murphy

Pink: No Class

Red: Compulsory Class Test under exam conditions

ESSAY

The submission deadline is 11:59 pm on Friday the 18th of November 2011. Essays should be submitted by the MMS system. You will select one topic as a subject for a 1500 word essay from the following list of titles. The essay contributes 20% towards the final mark for the course.

1. "... compositional principles with a strong mathematical content became the dominant influence on much of the early creative output produced using [music] software ..." Manning, 2004. Discuss.
2. Compare and contrast Musique Concrete and Elektronische Musik.
3. Chart the history of sound synthesis, being sure to cover both analogue and digital methods.
4. The electric guitar has succeeded at the expense of other instruments. Discuss.
5. Discuss the challenges and varied methods employed in making live electronic music successful.
6. How has psychoacoustics aided the development of electric sound?
7. Discuss the development of electric instruments prior to 1945.
8. How has digital technology changed the music business?

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

1. Gather detailed knowledge of a relevant body of information using both primary and secondary sources.
2. Develop and argue in favour of your own hypotheses concerning electronic music.
3. Discuss compositions in relation to their historical, technological and musical contexts.

Your ability to analyse material in an insightful way rather than merely listing events in chronological order is of particular importance. This involves your acquiring a thorough knowledge of the area and careful preparation of arguments. The difference between a good essay and a great essay often relates to areas where there are no right and wrong arguments, but rather to differences in the level of insight and evidence in support of those arguments. Always give references to appropriate sources and give a full bibliography. Plagiarism will not be tolerated.

For marking criteria for essays and 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 16th of December 2011. This should be handed in to the Social Anthropology office at 71 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 (finalised) data CDR (not an audio CD or DVD) containing the following:

- A full audio mixdown of your composition incorporating both audio recordings and synthesised sounds.
- The “*Logic Project*” file or “*Ableton Live Set*” file for your composition along with the associated sub-directories

The electronic composition submission contributes 40% of the final mark for the course.

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 CD 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.

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 CD so that the full audio mixdown can be listened to and the “*Logic Project*” file or “*Abelton Live Set*” file 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 CD or the “*Logic Project*” file or “*Abelton Live Set*” file 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 CD or the “*Logic Project*” file or “*Abelton Live Set*” file 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 originality 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.

CLASS TEST

You will select one topic from each of two sections. The 50-minute class test contributes 20% towards the final mark for the course and will take under exam conditions. This test will be held at 9:00 am on Thursday the 1st of December 2011 in Arts Building Seminar Room 7.

The examination will be based on the material covered in the Strand 1 and Strand 2 lectures.

The assessment criteria for the exam 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.

PODCASTS

The submission deadline for the Podcast is 11:59 pm on Friday the 28th of October 2011. Podcasts should be submitted as an MP3 file in the MMS system. The Podcasts created will take the form of educational introductions 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?)
- Demonstrations of the filtering, voicing and modulation options (filter sweeps, vibrato etc.)
- Demonstration of polyphony and note triggering (monophonic? built in sequencer? polyphonic)
- 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.

The Podcasts may be used as part of a Peer-Assisted Learning resource, which may be accessed by other members of the class if students give permission for this to happen.

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:

- Moog Etherwave Theremin Hardware Instrument
- Arturia Minimoog V Software Instrument
- Arturia Modular V 2 Software Instrument
- Arturia ARP2600 V Software Instrument
- Arturia Prophet-V2 Software Instrument
- Arturia CS-80V2 Software Instrument
- Arturia Jupiter-8V2 Software Instrument
- Native Instruments FM8 Software Instrument
- Native Instruments Absynth 5 Software Instrument
- Native Instruments Massive Software Instrument
- Native Instruments Kontakt 4 Software Instrument
- Native Instruments Reaktor5 Software Instrument
- Spectrasonics Omnisphere Software Instrument
- Logic's built in EVB3 Tonewheel Organ
- Ableton Live's built in Simpler Software Instrument
- Ableton Live's built in Impulse Software Instrument

Most of the instruments listed are installed on only one computer.

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.

RESOURCES

The full reading list for the course can be found under: <http://resourcelists.st-andrews.ac.uk>

KEY READING

- Manning, Peter [Revised and Expanded edition] (2004) *Electronic and Computer Music*. Oxford University Press. Available through SAULCAT as an electronic book in addition to physical print copies.

ABBREVIATED SUPPLEMENTARY READING:

- Russ, Martin [3rd Ed.] (2009) *Sound Synthesis and Sampling*. Oxford: Focal Press.
- Collins, Nick and d'Esquivan, Julio [eds]. 2007. *The Cambridge Companion to Electronic Music*. Cambridge: Cambridge University Press.
- Chadabe, Joel. 1997. *Electric Sound: The Past and Promise of Electronic Music*. New Jersey: Prentice Hall.
- Coleman, Mark. 2003. *Playback: from the Victrola to MP3, 100 years of music, machines, and money*. Da Capo Press.
- Shapiro, Peter [ed]. 2000. *Modulations: a History of Electronic Music: Throbbing Words on Sound*. New York: Caipirinha Productions
- Schaefer, John. 1987. *New Sounds: A Listener's Guide to New Music*. New York: Harper Collins
- Benson, David. 2006. *Music: A Mathematical Offering*. Cambridge.
- Pinch, Trevor and Trocco, Frank. 2002. *Analog Days: The Invention and Impact of the Moog Synthesizer*. Harvard University Press.
- Welsh, Fred. 2006. *Welsh's Synthesizer Cookbook: Synthesizer Programming, Sound Analysis, and Universal Patch Book*.
- Katz, Bob. 2007. *Mastering Audio: The Art and the Science*. 2nd edition. Focal Press.
- Waksman, Steve. 2001. *Instruments of Desire: The Electric Guitar and the Shaping of Musical Experience*. Harvard University Press.
- Holmes, Thom. 2008. *Electronic and experimental music: technology, music, and culture*. Routledge.
- Collins, Nick. 2009. *Introduction to Computer Music*. Wiley.
- Cox, Christoph. and Warner, Daniel. (Eds). 2004. *Audio Culture: Reading in Modern Music*. Continuum.
- Harley, James. 2005. *Xenakis: his life in music*. Routledge.
- Ross, Alex. 2009. *The rest is noise: listening to the twentieth century*. HarperCollins.
- Moorefield, Virgil. 2005. *The Producer as Composer: Shaping the Sounds of Popular Music*. MIT.

There are also many web-based resources available through the University Library including Grove Online, and JSTOR. Also see <http://resourcelists.st-andrews.ac.uk>