

声音制作与合成
Sound Production & Synthesis

Syllabus

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1. **Course description**

During this course you will learn how to use the Reaktor software in order to create and modify sound. You will learn with this software how different synthesis techniques work. You will also learn the basics of the MIDI standard and how to use it.

2. **Duration / instruction with lecturer**

The course is scheduled for a duration of 4 hours on wednesdays starting September 24th 2009.

Depending on course content the theoretical part will take from 1 hour to 90 minutes. During the workshop we will experiment with what you learned during the lecture and we will discuss the progress of your assignments.

5. **Weekly syllabus**

Week 01 – September 23rd

Lecture: Fundamentals of sound, classification of musical instruments, listening modes.

Listening + exercise : Identify sounds of the environment.

Workshop: Making sound with everyday items – bring items next week!!!

Week 02 – September 30th

Lecture: History of electronic music. MIDI basics.

Workshop: Present items and their sound

Week 03 – October 07th - *National Day holiday*

Week 04 – October 14th

Lecture: Introduction to Reaktor 5. Subtractive synthesis, building blocks of sound.

Workshop: Find your way in the Reaktor menus.

Week 05 – October 21st – assignment #1 given

Lecture: Subtractive synthesis, signal flow. oscillator synchronization and frequency modulation. Relevant building blocks in Reaktor.

Workshop: Creating a piece of ambient music **This is assignment #1**

Week 06 – October 28th

Lecture: Subtractive synthesis, step sequencers and modulation matrixes.

Workshop: Making a dance track. Reaktor as a plug-in.

Week 07 – November 04th written test one : subtractive synthesis

Lecture: Sampling

Workshop: Making sound with samples from objects.

Week 08 – November 11th

Lecture: Sampling, building complex instruments.

Workshop: Working with loops and MIDI sync

Week 09 – November 18th

Lecture: Sampling and granular synthesis.

Workshop: Progression of projects. Modifying Reaktor ensembles.

Week 10 – November 25th – assignment #1 due

Lecture: Methods of digital synthesis. FM synthesis. Introduction to Absynth.

Listening: Project 1 submissions and critique.

Workshop: More work with loops and synchronized patterns.

Week 11 – December 02nd

Lecture: FM synthesis and additive synthesis.

Workshop: Combining FM and analog sounds.

Week 12 – December 09th 2nd assignment given : Make a soundscape

Lecture: Again AM and FM. Absynth in depth.

Workshop: The exiting possibilities of working with envelopes in Absynth.

Week 13 – December 16th

Lecture: Digital filtering 2. Convolution and other spectrum based techniques.

Workshop: Creating effects in Reaktor.

Week 14 – December 23th – Written test 2 : Digital forms of synthesis

Lecture: Effects in Reaktor. Absynth as effects processor.

Workshop: Progress of final submissions

Week 15 – December 30th

Lecture: Esthetics. Discussion on relation of “creator” and audience.

Workshop: Creating complex timbres. Designing Reaktor ensembles.

Week 16 – January 06th – assignment #2 due

Critique of submissions. Resuming term 1.

4. Assessment

In each term you will have to pass 2 written tests and submit 2 practical works. The written test covers the theoretical content of the course whereas the practical work will be one piece of sound for each submission. In term one this is a piece of music, in term two it is one experimental piece of music and sound (“soundscape”) and a soundtrack for a scene or a short film. The weighing is:

1st written test	20%
2nd written test	20%
1st practical work	25%
2nd practical work	35%

During written tests the use of a dictionary is formally permitted.

For your professional english, the final mark is composed of

spoken expression during the course	50%
written expression in tests	50%

6. Reading material for this course

I will provide reading material in Adobe Acrobat format. You will have no other compulsory literature for this course.

7. Further reading / self study

(1) Specific books about synthesis

Martin Russ: Sound Synthesis and Sampling 2nd edition
Music Technology Series, Focal Press 2004

There are many many online resources which are absolutely excellent. Apart from the articles that I give you, please try

University of Salford :

http://www.acoustics.salford.ac.uk/acoustics_info/sound_synthesis/?content=index

Wikipedia :

http://en.wikibooks.org/wiki/Sound_Synthesis_Theory

(2) General material about sound

Tom Kenny: Sound for Picture

Mix Books, published by artistpro, Vallejo, CA, USA 2000

(this is a series of interviews, it contains no theory but it is an inspiring reader)

Tomlinson Holman: Sound for Film and Television

2nd edition, Focal Press, Boston Mass, USA 2002

8. Lecturer's contact

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