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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Title >** | **Synthesizer and Signal Processor Design** | | | | | | | | | | | | | | | |
| Module Title > | Music Technology Systems | | | | | | | | | | | | | | | |
| Module CRN Code > | 23466 | | | | | | Level > | | 4 | | Semester > | | | | 1 | |
| Programme Codes > |  | | | S/PSV/F1 | |  | |  | | | |  | |  | | |
| Weighting > | 50 | % of the module mark | | | | | Issued on > | | |  | | | Week No. > | | | 6 |
| Assessor(s) > | Jos.Hirst | |  | |  | | Submit by time > | | | N/A | | | Week No. > | | | 12 |

**Learning Outcomes of this Assessment**

The ability to design basic sound synthesizers and signal processors in a software environment.

**Key Skills to be Assessed**

Application of Numeracy: Numerical manipulation using Reaktor software

Information Technology: Use of Reaktor software

Managing Own Learning: Time management and the use of facilities outside of timetabled hours

**Tasks and Allocated Marks**

Part 1 (70% of the assessment total)

Design a modular synthesizer using Reaktor. Include as many elements as possible that have been discussed and investigated in lectures and labs. The synthesizer should have at least, the following features:

Various switchable audio oscillators, noise generators and sample modules

Vibrato and Tremolo

Envelope Generator

Switchable filter with envelope generator/LFO controlled filter frequency

Dual detunable oscillators

Controllable ring modulation synthesis

Controllable additive synthesis

Basic Drum Machine with two original samples

The synthesizer should have a suitable control panel including snapshots (presets). Include **five** of your own global snapshots. Two of these snapshots must be emulations of a police siren and the wind blowing. The synthesizer should be capable of providing a wide range of sounds with no possibility of noise or distortion and should be neat and easy to use. The synthesizer must be set up to provide an example as soon as the file is opened.

Part 2 (**30%** of the assessment total)

Design a multi-module signal processor using Reaktor. The processor should be capable of simultaneous chorus, stereo delay and distortion. **Do not use any of the preset effects available in Reaktor.**

The signal processor should have a suitable control panel including snapshots (include **four** of your own global snapshots). The signal processor should use an appropriate source signal and should be set up to provide an example as soon as the file is opened. The design of the processor should tidy, flexible and easy to use. There will be no possibility of noise or distortion.

*In the last week of the semester you will be asked to demonstrate your work to the module coordinator during the lab sessions. Details of the demonstrations will be announced closer to the time. See the Marking Scheme for the assignment of marks to individual elements. See the Grade Descriptors for how the marks are allocated.*

**Music Technology - Synthesis Assignment Demo**

Student: Date:

|  |  |  |  |
| --- | --- | --- | --- |
| **Synthesizer (70%)** | | **Signal Processor (30%)** | |
| Multi Sources (saw, square, pulse, noise etc.) | /5 | Chorus (stereo? Mix?) | /8 |
| Vibrato and Tremolo (bypass switches, unipolar LFO) | /9 | Delay (ping-pong? LCR, filters?) | /10 |
| ADSR amplitude control | /6 | Distortion | /3 |
| Complex Filter (EG/LFO controlled) | /9 | Design / Layout / Innovation | /4 |
| Detuned Oscillators (Coarse/Fine bypass) | /5 | Snapshots (4) | /4 |
| AM and RM (Controllable AM?) | /7 | Distortion Free? | /1 |
| Additive (filters? Panpot? stereo?) | /9 |  |  |
| Drum Machine (stereo? Mixer? 2 original samples) | /7 |  |  |
| Design / Layout / Innovation | /6 |  |  |
| Snapshots (5 inc wind and siren) | /5 |  |  |
| Distortion Free? | /2 |  |  |
|  |  |  |  |
| **Total** |  | **Total** |  |

Comments:

**Grade Descriptors**

|  |  |  |
| --- | --- | --- |
| **Degree Classification Band** | **Percentage Band (%)** | **Grade Descriptor** |
| **First** | **70-100** | Outstanding, excellent or very good work. The synthesizer and FX unit function perfectly or near to perfectly. The design is technically excellent and innovative. The student has demonstrated an outstanding understanding of all the elements in the synthesizer and FX unit. |
| **2:1** | **60-69** | A good piece of work. Good functionality in the design of the synthesizer and FX unit. Technically competent, with a few small errors. A good understanding of all or almost all of the elements in the synthesizer and FX unit has been demonstrated. |
| **2:2** | **50-59** | A fair piece of work. Fair functionality in the design of the synthesizer and FX unit. Technically competent, with some errors. A fair understanding of some of the elements in the synthesizer and FX unit has been demonstrated. |
| **Third** | **40-49** | A adequate piece of work. Adequate functionality in the design of the synthesizer and FX unit. Somewhat technically competent, with errors. An adequate understanding of some of the elements in the synthesizer and FX unit has been demonstrated. |
| **Fail** | **20-39** | A poor piece of work. Poor functionality in the design of the synthesizer and FX unit. Not technically competent, with major errors. A poor understanding of the elements in the synthesizer and FX unit has been demonstrated. |
| **Fail** | **0-19** | Extremely poor. Some attempt was made to complete the task, but the synthesizer and FX unit are not functional. Technical competency or understanding are not present. |