



## Assessed Coursework

Course Name	Artificial Intelligence 4		
Coursework Number	1		
Deadline	Time:	16.30pm	Date: December 2 <sup>nd</sup> 2014
% Contribution to final course mark	20%	This should take this many hours:	20 hours
Solo or Group ✓	Solo ✓	Group	
Submission Instructions	The report must be in pdf format and must be submitted via the Moodle page of the course.		
Who Will Mark This? ✓	Lecturer ✓	Tutor	Other
Feedback Type? ✓	Written ✓	Oral	Both
Individual or Generic? ✓	Generic	Individual ✓	Both
Other Feedback Notes	N/A		
Discussion in Class? ✓	Yes	No ✓	
Please Note: This Coursework cannot be Re-Done			

### Code of Assessment Rules for Coursework Submission

Deadlines for the submission of coursework which is to be formally assessed will be published in course documentation, and work which is submitted later than the deadline will be subject to penalty as set out below. The primary grade and secondary band awarded for coursework which is submitted after the published deadline will be calculated as follows:

- (i) in respect of work submitted not more than five working days after the deadline
  - a. the work will be assessed in the usual way;
  - b. the primary grade and secondary band so determined will then be reduced by two secondary bands for each working day (or part of a working day) the work was submitted late.
- (ii) work submitted more than five working days after the deadline will be awarded Grade H.

Penalties for late submission of coursework will not be imposed if good cause is established for the late submission. You should submit documents supporting good cause via MyCampus.

**Penalty for non-adherence to Submission Instructions is 2 bands**

You must complete an "Own Work" form via

<https://webapps.dcs.gla.ac.uk/ETHICS> for all coursework

**UNLESS submitted via Moodle**

Marking Criteria
See rest of the document.

# Artificial Intelligence - Assessed Exercise

## Introduction

The assessed exercise consists of a report (see below for the structure) *to be submitted on December 2<sup>nd</sup>, 2014 at 16.30*. The report must contain a detailed description of experiments and results obtained during the laboratory sessions of the course (Thursday, 16.00-17.00 unless otherwise specified). The experiments cover the two main blocks of the course (see the Moodle page for more information about the course blocks):

- **Sensing:** students are expected to develop a system capable of extracting energy, magnitude and Zero Crossing Rate from audio signals. The audio data is provided as a list of integer numbers in text files.
- **Reasoning:** students are expected to develop a system capable of 1) representing audio data in terms of a few basic properties (average energy, average magnitude, average Zero Crossing Rate), and 2) inferring the type of audio data (speech or silence) via statistical approaches.

The laboratory sessions of the course (Thursday, 16.00-17.00 unless otherwise specified) will be dedicated to the implementation of the experiments to be reported in the assessed exercise. During these sessions, the teachers will be available to provide help and/or suggestions.

## The report

The assessed exercise consists of a report including the following chapters (*submission deadline on December 2<sup>nd</sup>, 16.30*):

**Chapter1 - Design (15% of the total score):** This chapter should provide a general description of the exercise in “PEAS” terms, i.e. in terms of Performance, Environment, Actuators and Sensors.

The main assessment criteria for the “Design” chapter are as follows:

- The report must explain what the four elements of the PEAS framework are in general (what is the Performance? What is the Environment? Etc.). Clarity and correctness of the explanation are the marking criteria of this part. The adoption of a correct terminology is of particular importance.
- The report must describe the laboratory experiments in PEAS terms (what is the Performance measure in the experiments? What is the Environment in the experiments? Etc.). Appropriateness of the explanation is the marking criterion of this part. The adoption of a correct terminology is of particular importance.

**Chapter 2 - Theory (50% of the total score):** this chapter should include explanations about the approaches adopted, including equations applied to perform the different stages of the project, description of the data and results obtained (plots, performance measurements, etc.).

The marking criteria of the “Theory” chapter are as follows:

- The signal processing approaches adopted in the assessed exercise must be explained in detail, including appropriate equations and plots. This applies in particular to the extraction of Energy, Magnitude and Zero Crossing Rate. The marking criteria of this part are correctness, completeness and clarity of the explanations. Furthermore, the plots are expected to be readable and informative.
- The statistical approaches adopted in the assessed exercise must be explained in detail, including appropriate equations and formulas. The explanation must include theory and assumptions behind the Naïve Bayes Classifier as well as the decision rule adopted in the experiments. The marking criteria of this part are correctness, completeness and clarity of the explanations.

**Chapter 3 – Experiments (15% of the total score):** this chapter should report on the experiments performed during the laboratory and provide clear explanations about experimental setup and results.

- The experimental setup adopted in the experiments must be explained in detail. This includes an explanation of the cross-validation approach as well as a description of the performance metric adopted to measure the effectiveness of the approaches. The marking criteria of this part are correctness, completeness and clarity of the explanations (including the use of plots and graphics to illustrate the results).

**Appendix A – Code (20% of the total score):** the code developed to perform the exercise should be attached as an appendix to the report, the code has to be original, appropriately commented and should respect basic software-engineering principles acquired at the University. The use of software packages and/or libraries (Matlab, Matplotlib, etc.) is allowed as long as all signal processing and statistical algorithms are implemented from scratch, e.g., without the use of built-in functions that perform the same tasks.

- The marking criteria for the code are quality and clarity of the comments, implementation of the algorithms (readability of the code) and organization of the code (development of appropriate functions and/or methods, evidence of the processing steps sequence).

## Timeline

Data and instructions will be delivered via Moodle as the course evolves. The overall timeline is as follows:

- October 9<sup>th</sup>, 2014: the first stage of the exercise is handed out via Moodle (including both data and instructions), the first stage is performed during the laboratory sessions of October 9<sup>th</sup>, 16<sup>th</sup>, 23<sup>rd</sup>, and 30<sup>th</sup>, 2014.
- October 31<sup>st</sup>, 2014: the text of the assessed exercise is posted on Moodle.
- November 6<sup>th</sup>, 2014: the second stage of the exercise is handed out via Moodle (including both data and instructions), the second stage is performed during the laboratory sessions of November 6<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, and 27<sup>th</sup>, 2014.
- **December 2<sup>nd</sup>, 2014 at 16.30: submission deadline.**

## Contacts

In case of doubts and/or problems, please contact:

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