1. **Title of the module**

COMP6620 (CO662) - Signal Analysis for Computing

1. **Division or partner institution which will be responsible for management of the module**

Division of Computing, Engineering, Mathematical Sciences (CEMS)

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 6

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn or Spring

1. **Prerequisite and co-requisite modules**

None

1. **The course(s) of study to which the module contributes**

BSc Computer Science (and pathways)

BSc Computing and Business Administration

BSc Computing (and pathways)

BSc Business Information Technology

BSc Software Engineering

BSc Artificial Intelligence

Computing Joint Honours programmes

“Year in Industry” equivalents

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**

8.1 Demonstrate a systematic understanding of basic principles of digital signals

8.2 Describe and comment upon the different categories of digital signals

8.3 Identify and apply pre- and post- processing techniques, such as conditioning, filtering, feature extraction, classification and hypothesis testing techniques for various types of signals

8.4 Demonstrate the ability to use Matlab for analysis and visualisation of digital signals

8.5 Apply their knowledge and understanding to initiate and carry out real world signal analysis problem solving

1. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**

9.1 Make effective use of general computing facilities

9.2 Engage with research literature and other information sources

9.3 Communicate technical issues clearly in written formats

9.4 Manage their own learning and development, including time management and organisational skills

1. **A synopsis of the curriculum**

This module will provide the student with an understanding of basic principles of signals; introduce digitisation methods such as sampling, quantisation and coding; describe and apply signal analysis techniques, such as segmentation, noise reduction, filtering, spectral analysis, feature extraction and classification (including recognition and decision making) to solve practical signal analysis problems using Matlab.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

R. Palaniappan, “Biological Signal Analysis,” BookBoon, 2010, http://bookboon.com/en/textbooks/it-programming/introduction-to-biological-signal-analysis. The free to download ebook has the core material on signal analysis and classification.

I. McLoughlin, “Applied Speech and Audio Processing,” Cambridge University Press, 2009

B. W. Schuller, “Intelligent Audio Analysis,” Springer, 2013

L. Sornmo and P. Laguna, “Bioelectrical Signal Processing in Cardiac and Neurological Applications,” Elsevier Academic Press, 2005

R.M. Rangayyan, “Biomedical Signal Analysis, 2nd ed.,” IEEE-Wiley Press, 2015

S. Mitra, “Digital Signal Processing: A Computer-based Approach, 4th ed.,” McGraw-Hill, 2010

1. **Learning and teaching methods**

Total contact hours: 30

Private study hours: 120

Total study hours: 150

1. **Assessment methods**
   1. Main assessment methods

1 piece of coursework (40 hours) (50%)

2 hours unseen exam (50%)

13.2 Reassessment methods

Like for like.

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* |  | *9.1* | *9.2* | *9.3* | *9.4* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| Lectures | **x** | **x** | **x** | **x** |  |  |  |  |  |  |
| Classes |  |  | **x** | **x** | **x** |  | **x** |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Coursework |  |  | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| Report with Matlab code as appendix |  |  | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| 2 hour examination | **x** | **x** | **x** | **x** |  |  |  |  |  |  |

1. **Inclusive module design**

The Division recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

The topics addressed by this module relate to a field which is of international importance, given the global role of computers in today's technological innovation. The topics covered by this module are international in nature, being identical worldwide and independent of traditional spoken language.

**DIVISIONAL USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

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| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 23/11/2020 | Minor | September 2021 | 7, 16 | No |
|  |  |  |  |  |