Information Theory and Data Communication

Module Code: COS7007-B  
Academic Year: 2018-19  
Credit Rating: 20  
School: Department of Computer Science  
Subject Area: Computer Science  
FHEQ Level: FHEQ Level 7 (Masters)

Pre-requisites:  
Co-requisites:

Contact Hours

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>24</td>
</tr>
<tr>
<td>Laboratory</td>
<td>24</td>
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<tr>
<td>Directed Study</td>
<td>152</td>
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Availability Periods

<table>
<thead>
<tr>
<th>Occurrence</th>
<th>Location/Period</th>
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<tbody>
<tr>
<td>BDA</td>
<td>University of Bradford / Semester 1 (Sep - Jan)</td>
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Module Aims
The aim of this module is to introduce and apply basic principles of information theory for data communication. The focus is on concepts and techniques for reliably transmitting and efficiently processing data.

Outline Syllabus

Module Learning Outcomes
On successful completion of this module, students will be able to...

1. Gain practical understanding of how data can be quantitatively measured, and effectively processed and communicated using information-theoretic principles;

   Demonstrate knowledge and general understanding on the fundamental limits for data communication and a number of factors affecting the reliability of data communication.

2. Demonstrate knowledge of information-theoretic principles underlying any data compression and communication systems;

   Apply the principles to design efficient compressor/decompressor and reliable transmission schemes for data communication.

3. Acquire confidence in applying rigorous analytical approaches to assess problems in random environments.

   Deploy efficient time-management and problem formulation and solving skills to solve complex practical problems.

   Write and communicate in concise, clear and coherent manner.

Learning, Teaching and Assessment Strategy

A series of lectures will provide the essential theories and concepts. Laboratory sessions will provide practical applications of the concepts. Oral feedback is given during the practical classes as appropriate. Module assessment consists of two coursework exercises aimed to test skills, knowledge and understanding on theoretical concepts to solve relevant practical problems. The supplementary assessment follows the coursework format to address deficiencies encountered at the first attempt.

Mode of Assessment

<table>
<thead>
<tr>
<th>Type</th>
<th>Method</th>
<th>Description</th>
<th>Length</th>
<th>Weighting</th>
<th>Final Assess'</th>
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<tbody>
<tr>
<td>Summative</td>
<td>Coursework</td>
<td>Coursework 2 (group) - Exercises on data transmission</td>
<td>0 hours</td>
<td>50%</td>
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<tr>
<td>Referral</td>
<td>Coursework</td>
<td>Supplementary coursework assessment (individual coursework)</td>
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<td>Summative</td>
<td>Coursework</td>
<td>Coursework 1</td>
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</table>
Exercises on data compression and algorithms.

Legacy Code (if applicable)
CM-0439D

Reading List
To view Reading List, please go to rebus:list.