F28DA Data Structures and Algorithms

COURSE DETAILS
Course Code: F28DA
Full Course Title: Data Structures and Algorithms
SCQF Level: 8
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

Additional Information:
<p>&#160;</p><p>&#160;</p>

COURSE AIMS
To introduce core algorithms and data structures used in a wide range of applications in Computer Science.

To further develop skills in algorithm and data structure design, and the development of medium sized programmes.

LEARNING OUTCOMES – SUBJECT MASTERY

• Ability to analyse and hence choose suitable algorithms and data structures for a given problem
• To design and implement medium sized programs based on a range of standard algorithms and data structures and making appropriate use of Libraries
• Understanding the distinction between abstract Abstract Data Type (ADT) properties and concrete ADT realisations
• Appreciation of need for integration of multiple ADTs in substantial programs
• Appreciation of efficiencies/reassurances from ADT reuse
• Appreciation of security aspects of algorithm complexity

LEARNING OUTCOMES – PERSONAL ABILITIES

• To be able to critically analyse and hence choose suitable algorithms and data structures for a given problem
• To be able to convey the advantages and disadvantages of alternative data structures and algorithms
• To develop practical problem-solving skills in the context of programming
• To be able to plan & execute a substantial software project

SYLLABUS
**F28DA Data Structures and Algorithms**

- Algorithm and data structure topics including: advanced trees, string processing, simple cryptography, graphs, hash tables
- Algorithm/data structure choice, design and deployment

**NOTE:** Courses F27SA Software Development 1, F27SB Software Development 2 are pre-requisites for this course, or courses F28PA Software Development A, F28PB Software Development B must be taken on the same year as this course, or equivalent.

### COURSE RELATIONSHIPS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Title</th>
<th>School</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>F27SB</td>
<td>7</td>
<td>Software Development 2</td>
<td>School of Math and Comp Sci.</td>
<td>Pre-Requisite</td>
</tr>
<tr>
<td>F27SA</td>
<td>7</td>
<td>Software Development 1</td>
<td>School of Math and Comp Sci.</td>
<td>Pre-Requisite</td>
</tr>
<tr>
<td>F28PA</td>
<td>8</td>
<td>Software Development A</td>
<td>School of Math and Comp Sci.</td>
<td>Linked</td>
</tr>
<tr>
<td>F28PB</td>
<td>8</td>
<td>Software Development B</td>
<td>School of Math and Comp Sci.</td>
<td>Linked</td>
</tr>
</tbody>
</table>

### LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
<th>Dub</th>
<th>Malay</th>
<th>IDL</th>
<th>COLL</th>
<th>ALP</th>
<th>OTH</th>
<th>Method</th>
<th>Weight</th>
<th>Exam Mins</th>
<th>Type</th>
<th>Diet</th>
<th>Synoptic Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ALP</td>
<td>OTH</td>
<td>Examination</td>
<td>60</td>
<td>120</td>
<td>Assessment</td>
<td>Semester 2</td>
<td>ALP - Assessment is 100% examination. Summative coursework will be assessed by the ALP and moderated by HWU. All summative coursework must be completed to a satisfactory standard (Grade D) for a student to pass the course but will not form part of a student's final grade.</td>
</tr>
</tbody>
</table>