

Module Title	Critical and Computational Thinking	School	Mathematics and Computer Sciences				On or Off-Campus	On	
Module Co-ordinator	Judy Robertson/Rob Pooley	SCQF Level	9	Module Code	F29CT	Semester	1	Credits	15

1. Pre-requisites	None		
2. Linked Modules (specify if synoptic)			
3. Excluded Modules	None		
4. Replacement Module	Code:	5. Availability as an Elective	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	Date Of Replacement:		
6. Degrees for which this is a core module	Mandatory module for BSc Information Systems		
7. Aims			

The module aims to give students the opportunity to develop general thinking skills which will be useful to them throughout their studies and future lives.

They will gain knowledge and experience of:

- ◆ *Critical thinking* including assessing credibility of evidence, assessing and developing arguments, resolving dilemmas and critical reasoning.
- ◆ *Creative thinking* including the phases of ideas preparation, generation, selection, evaluation and dissemination.
- ◆ *Meta-cognitive skills* including the capacity to evaluate and switch thinking strategies when appropriate.
- ◆ *Computational thinking* – applying the techniques of abstraction, modelling and algorithmic solutions to a wide range of problems, particularly those relevant to information systems and organisations.

#### 8. Syllabus

Logical fallacies, critical thinking case studies drawn from topical media reports, reflection on progress of design work, effective strategies for problem solving, techniques for computational thinking including abstraction, generalisation, modelling and algorithm development.

Use of solution techniques from other disciplines in problem solving.

Understanding the relevance of different problem solving approaches in various types of problem.

Combining techniques to solve decomposed problems.

Reporting and explaining solutions using a wide range of formats and notations, including textual, graphical and symbolic forms.

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### 9. Learning Outcomes (HWU Core Skills: Employability and Professional Career Readiness)

<b>Subject Mastery</b>	<p><b>Understanding, Knowledge and Cognitive Skills</b>      <b>Scholarship, Enquiry and Research (Research-Informed Learning)</b></p> <p>Students will develop skills in the following areas:</p> <ul style="list-style-type: none"> <li>◆ Critically analysing arguments in written or verbal form.</li> <li>◆ Analysing problems using computational thinking</li> <li>◆ Working productively on creative projects.</li> <li>◆ Monitoring and evaluating the effectiveness of their thought processes.</li> <li>◆ Communicating ideas and solutions to others, including those from other disciplines.</li> </ul>
<b>Personal Abilities</b>	<p><b>Industrial, Commercial &amp; Professional Practice</b>      <b>Autonomy, Accountability &amp; Working with Others</b>      <b>Communication, Numeracy &amp; ICT</b></p> <p>Students will develop skills in the following areas:</p> <ul style="list-style-type: none"> <li>◆ Analyse and interpret numerical and graphical as evidence for an argument</li> <li>◆ Communicate critical thinking effectively to non-expert audiences.</li> <li>◆ Exercise autonomy and initiative by planning and managing their own work (PDP);</li> <li>◆ Take responsibility for their own and other's work by contributing effectively and conscientiously to the work of a group (PDP).</li> <li>◆ Demonstrate leadership in group working.</li> </ul>

10. Assessment Methods				11. Re-assessment Methods	
Method	Duration of Exam (if applicable)	Weighting (%)	Synoptic modules?	Method	Duration of Exam (if applicable)
Exam	2 hours	50%		Exam	2 hours
Coursework		50%			

  

12. Date and Version						
Date of Proposal	Date of Approval by School Committee	Date of Implementation	Version Number			
05 September 2007	December 2007	September 2008	1			