



**Prifysgol Cymru**  
Y Drindod Dewi Sant  
**University of Wales**  
Trinity Saint David

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Prifysgol Cymru Y Drindod Dewi Sant

**CertHE Computing Skills for the Workplace**  
**Birmingham Campus**

**Analysing and Solving Problems**  
**ACCA4019**

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>MODULE CODE:</b>   | <b>ACCA4019</b>                       |
| <b>TITLE:</b>         | <b>Analysing and Solving Problems</b> |
| <b>DATED:</b>         | <b>16/01/2023</b>                     |
| <b>LEVEL:</b>         | <b>4</b>                              |
| <b>CREDITS:</b>       | <b>20</b>                             |
| <b>PREREQUISITES:</b> | <b>None</b>                           |

### AIM(S)

- To provide students with the ability to develop generic solutions to problems using abstract thinking skills.

### LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to demonstrate the ability to:

1. Evaluate a problem and formulate requirements and constraints.
2. Analyse a problem and produce a logical solution.

### INDICATIVE CONTENT

- Deconstructing Technical Language and Identifying Problems
- Problem solving approaches and techniques
- Interpreting natural language problems
- Subdividing problems
- Constraining problems
- Determining generic and specific solutions.
- Abstract thinking skills
- Critical thinking skills
- Reapplying solutions across different contexts
- Rules, heuristics, and algorithms
- Logic and rhetoric
- Logical fallacies
- Boolean algebra
- Statistics and analysing results

### LEARNING AND TEACHING STRATEGY

| <b>Activity type</b> | <b>Hours</b> | <b>Percentage</b> |
|----------------------|--------------|-------------------|
| Scheduled learning   | 48           | 24%               |
| Independent learning | 152          | 76%               |
| Placement learning   | 0            | 0%                |
| <b>TOTAL</b>         | <b>200</b>   | <b>100%</b>       |

## ASSESSMENT

### Assessment Component 1 – Written/Practical - 50%

Time-constrained in-class test (1 hour)

### Assessment Component 2 – Coursework - 50%

Students will be required to solve a problem given logically, presenting requirements and possible solutions. (1500 words)

Exemplar: Describe the logical rules of a given game and develop requirements for a computer program to simulate the game.

### Assessment Summary

| Activity type | Percentage  |
|---------------|-------------|
| Coursework    | 50%         |
| Practical     | 50%         |
| Written exam  | 0%          |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

|                       |                                                                                                                                                           |                    |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Module Code</b>    | <b>ACCA4019</b>                                                                                                                                           |                    |
| <b>Module Title</b>   | <b>Analysing and Solving Problems</b>                                                                                                                     |                    |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                 | <b>Electronic*</b> |
| Essential             | Curzon P and McCowan P (2017) Power Of Computational Thinking, The: Games, Magic And Puzzles To Help You Become A Computational Thinker, World Scientific | √                  |
| Essential             | Levitin, A and Levitin, M (2011) Algorithmic Puzzles, Oxford University Press.                                                                            | √                  |
| Further               | Michalewicz, M and Michalewicz Z (2010), Puzzle-based Learning; An introduction to critical thinking, mathematics and problem solving, Hybrid Publishers. | √                  |
| Further               | Fraser, Jen and Anthony, P (2014) Everyone's a Genius: Simple Tips to Boost Your Brilliance Now, Ideation Training Pty Ltd                                | √                  |
| Further               | Gardner, M (1978) aha! Insight, Scientific American.                                                                                                      | √                  |
| Further               | McInerney, D Q (2005) Being Logical, Random House                                                                                                         | √                  |
| Further               | Watanabe, K (2009) Problem Solving 101: A Simple Book for Smart People                                                                                    | √                  |

## **BIBLIOGRAPHY**

### **Essential**

Levitin, A and Levitin, M (2011) *Algorithmic Puzzles*, Oxford University Press.

McInerny, D Q (2005) *Being Logical*, Random House.

Michalewicz, M and Michalewicz Z (2010), *Puzzle-based Learning; An introduction to critical thinking, mathematics and problem solving*, Hybrid Publishers.

### **Background**

Fraser, Jen and Anthony, P (2014) *Everyone's a Genius: Simple Tips to Boost Your Brilliance Now*, Ideation Training Pty Ltd

Gardner, M (1978) *aha! Insight*, Scientific American.

Watanbe, K (2009) *Problem Solving 101: A Simple Book for Smart People*