

## **MODULE DIRECTORY**

### **LEVEL 3 & 4**

### **ACADEMIC DISCIPLINE OF APPLIED COMPUTING**

### **WALES INSTITUTE OF SCIENCE AND ART**

**2024-2025**

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## **INTRODUCTION**

This Module Directory includes all the modules for Level 3 & 4 within the Academic Discipline of Applied Computing (WISA) in the academic year 2024-2025.

This directory accompanies the Programme of Study Handbook, which will provide you with details of which modules you will be studying for your programme this year in the 'Programme of Study' section. This directory may include modules that are running on other programmes of study within your Academic Discipline/Institute. If you require assistance in identifying the modules for your programme of study, please contact the Programme Manager (whose name and contact details are provided in the accompanying Programme of Study Handbook), or the relevant Institute Office.

The University has made every effort to make the information as full and as accurate as possible, but you should note that minor changes in the organisation of modules between the planning stage and the actual teaching are inevitable. We shall try to keep any such changes to a minimum, and you will receive plenty of advance warning in the event of any alteration. We would also be grateful if you would let us know about any changes that you think might be helpful if introduced into future handbooks.

## MODULES

|                       |                                                |
|-----------------------|------------------------------------------------|
| <b>Module Code</b>    | <b>ACHA3000</b>                                |
| <b>Title</b>          | <b>Introduction to Mathematics and Science</b> |
| <b>Date</b>           | <b>14/05/2020</b>                              |
| <b>Level</b>          | <b>3</b>                                       |
| <b>Credits</b>        | <b>20</b>                                      |
| <b>Pre-Requisites</b> | <b>None</b>                                    |

### AIM(S)

- To provide students with a sound understanding of mathematical and scientific principles.

### LEARNING OUTCOMES

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

- Apply fundamental mathematical principles to a level that underpins the knowledge required for further study at a higher level.
- Identify and apply appropriate physical principles and relationships in the solution of problems

### INDICATIVE CONTENT

- Introduction to basic fractions, indices and standard form
- Introduction to the transposition of formulae
- Solution of linear equations
- Solution of quadratic equations
- Solution of simultaneous equations
- Introduction to trigonometry and right-angled triangles (SOHCAHTOA)
- An introduction to vectors
- Units - basic SI units of length, mass and time, area and volume, density and relative density, mass and weight, force, work and power.
- Forces and moments - conditions of static equilibrium, forces and reaction, especially simply supported beams. Moments of a form. Resultant, couples, centre of gravity. Vector rotation. Resolution of forces. Polygon of forces.
- Electrical current/voltage. Mechanical analogies. Resistors in series and parallel. The heating effect of current, variation of resistance with temperature incandescent lamp.
- Voltage divider and current divider. Simple circuit calculations, use of Ohm's law and Kirchhoff's laws.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| Written Exam       | 1 hour | 50%       |

### Assessment Component 2

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| Written Exam       | 1 hour | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACHA3000                                                                           |                                     |
|----------------|------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Introduction to Mathematics and Science                                            |                                     |
| Classification | Reading List entry                                                                 | Electronic*                         |
| Essential      | Smedley, R., Wiseman, G., Introducing Pure Mathematics (Oxford, 2001)              | <input type="checkbox"/>            |
| Essential      | Stroud, K.A. - <i>Engineering Mathematics</i> , (Palgrave Macmillan, 2013)         | <input checked="" type="checkbox"/> |
| Further        | Davies, H; Hicks, A, Mathematics for Scientific and Technical Students (1998)      | <input type="checkbox"/>            |
| Further        | Stroud, K A, (2007) Engineering Mathematics, Industrial Press                      | <input type="checkbox"/>            |
| Further        | McDonagh, I. and Waterworth (2015), G. Engineering Science Volumes 1 and 2, Arnold | <input checked="" type="checkbox"/> |
| Further        | Bird, J. O. and Ross, C. (2012) Mechanical Engineering Principles, Routledge       | <input type="checkbox"/>            |

|           |                                                                             |                                     |
|-----------|-----------------------------------------------------------------------------|-------------------------------------|
| Further   | Bird, J, (2006) Higher Engineering Mathematics, Newnes                      | <input type="checkbox"/>            |
| Further   | McDonagh, I., Mechanical Science for Technicians Volume 1, Arnold           | <input type="checkbox"/>            |
| Further   | Hannah, J. and Hillier, M.(1999) Mechanical Engineering Science, Longman    | <input type="checkbox"/>            |
| Further   | Bird, J. O. and Ross, C.(2012) Mechanical Engineering Principles, Routledge | <input type="checkbox"/>            |
| Reference | <a href="http://www.khanacademy.org">www.khanacademy.org</a>                | <input checked="" type="checkbox"/> |

|                       |                                 |
|-----------------------|---------------------------------|
| <b>Module Code</b>    | <b>ACBA4014</b>                 |
| <b>Title</b>          | <b>Group Project for CertHE</b> |
| <b>Date</b>           | <b>04/08/2023</b>               |
| <b>Level</b>          | <b>4</b>                        |
| <b>Credits</b>        | <b>20</b>                       |
| <b>Pre-Requisites</b> | <b>None</b>                     |

### AIM(S)

- To enable students to apply the knowledge they have gained through the modules they have studied, in the development of project. The product of the project will take the form of a subject related application which may be a software application, electronics application, design, etc.

### LEARNING OUTCOMES

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

- apply the knowledge and skills gained through their study to solve problems as a team;
- understand and implement project life cycle, recognise project purpose, tools and techniques and the context.

### INDICATIVE CONTENT

- Product Lifecycle- Project Initiation to Project Closure.
- Literature review and requirements gathering.
- Research and development methodologies.
- Ethical issues and Sustainability issues.
- Development of documentation for academic projects.
- Presentation of work produced to an academic audience.

### Study Time Allocation

The study time for the module is divided as follows:

| <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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 2000 words | 60%       |

### Assessment Component 2

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment            | Volume            | Weighting |
|-------------------------------|-------------------|-----------|
| Presentation or Demonstration | Approx 10 minutes | 40%       |

### Assessment Summary

| Activity type | Percentage  |
|---------------|-------------|
| Written exam  | 0%          |
| Coursework    | 60%         |
| Practical     | 40%         |
| <b>TOTAL</b>  | <b>100%</b> |

### INDICATIVE READING LIST

| Module Code    | ACBA4014                                                                                                                                  |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Group Project for CertHE                                                                                                                  |                                     |
| Classification | Reading List entry                                                                                                                        | Electronic*                         |
| Essential      | Larson, E.W. (2020) <i>Project Management</i> . 8th Edition. McGraw-Hill                                                                  | <input checked="" type="checkbox"/> |
| Further        | Newton, R. (2016), <i>Project Management Step by Step</i> , FT Publishing International                                                   | <input checked="" type="checkbox"/> |
| Further        | Hughes, B. (2019), <i>Project Management for IT-Related Projects</i> . 3rd Edition. British Computer Society                              | <input checked="" type="checkbox"/> |
| Further        | Christopher, D (2016) <i>Projects in Computing and Information Systems, a student's guide</i> , Pearson Education                         | <input type="checkbox"/>            |
| Further        | Berndtsson, T (2013) <i>Planning and Implementing your Project</i> , Springer Verlag                                                      | <input type="checkbox"/>            |
| Further        | Cottrell, S.(2011) <i>Critical Thinking Skills: Developing Effective Analysis and Argument</i> , Palgrave Macmillan                       | <input type="checkbox"/>            |
| Further        | Collis, J., Hussey, R (2013) <i>Business Research: a Practical Guide for Undergraduate and Postgraduate Students</i> , Palgrave Macmillan | <input type="checkbox"/>            |

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>Module Code</b>    | <b>ACCA4019</b>                       |
| <b>Title</b>          | <b>Analysing and Solving Problems</b> |
| <b>Date</b>           | <b>14/05/2020</b>                     |
| <b>Level</b>          | <b>4</b>                              |
| <b>Credits</b>        | <b>20</b>                             |
| <b>Pre-Requisites</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:

- Evaluate a problem and formulate requirements and constraints.
- 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

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment                                                                    | Volume | Weighting |
|---------------------------------------------------------------------------------------|--------|-----------|
| Practical – for example, a Moodle-based quiz or a task such as flowcharting a problem | 1 hour | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written assessment | 1500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4019                                                                                                                                                  |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Analysing and Solving Problems                                                                                                                            |                                     |
| Classification | Reading List entry                                                                                                                                        | Electronic*                         |
| 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 | <input checked="" type="checkbox"/> |
| Essential      | Levitin, A and Levitin, M (2011) Algorithmic Puzzles, Oxford University Press.                                                                            | <input type="checkbox"/>            |
| Further        | Michalewicz, M and Michalewicz Z (2010), Puzzle-based Learning; An introduction to critical thinking, mathematics and problem solving, Hybrid Publishers. | <input type="checkbox"/>            |

|         |                                                                                                                            |                          |
|---------|----------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Fraser, Jen and Anthony, P (2014) Everyone's a Genius: Simple Tips to Boost Your Brilliance Now, Ideation Training Pty Ltd | <input type="checkbox"/> |
| Further | Gardner, M (1978) aha! Insight, Scientific American.                                                                       | <input type="checkbox"/> |
| Further | McInerny, D Q (2005) Being Logical, Random House                                                                           | <input type="checkbox"/> |
| Further | Watanabe, K (2009) Problem Solving 101: A Simple Book for Smart People                                                     | <input type="checkbox"/> |

|                       |                                             |
|-----------------------|---------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4020</b>                             |
| <b>Title</b>          | <b>Introduction to Computer Programming</b> |
| <b>Date</b>           | <b>14/05/2020</b>                           |
| <b>Level</b>          | <b>4</b>                                    |
| <b>Credits</b>        | <b>20</b>                                   |
| <b>Pre-Requisites</b> | <b>None</b>                                 |

### AIM(S)

- To enable students to understand and apply programming constructs, languages and tools.

### LEARNING OUTCOMES

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

- Demonstrate an understanding of the syntax, semantics and software constructs of programming language.
- Deploy a programming language in developing a program given a well-defined scenario or problem.

### INDICATIVE CONTENT

- Programming/scripting languages e.g. C, Python, Perl, etc.
- Declaring variables, local and global variables, arrays, constants.
- Branch constructs: if, else, switch, Boolean AND/OR/NOT
- Loop constructs: while, for loops
- Functions: Arguments and return values
- Design and documentation of code e.g. flow diagrams
- Using a code editor, fundamental debugging techniques

### Study Time Allocation

The study time for the module is divided as follows:

| <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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                      | Volume                | Weighting |
|-----------------------------------------|-----------------------|-----------|
| Written report (with associated coding) | 3000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4020                                                                                                                                                                               |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Introduction to Computer Programming                                                                                                                                                   |                                     |
| Classification | Reading List entry                                                                                                                                                                     | Electronic*                         |
| Essential      | McGrath, M (2018) C Programming In Easy Steps 5 <sup>th</sup> Edition                                                                                                                  | <input checked="" type="checkbox"/> |
| Essential      | Novikov, D (2019) <i>Python for Beginners: The Ultimate Beginners Guide to Python Programming With Step by Step Guidance and Hands-On Examples.</i>                                    | <input checked="" type="checkbox"/> |
| Further        | Romano, F. (2018) <i>Learn Python Programming: The no-nonsense, beginner's guide to programming, data science, and web development with Python 3.7, 2nd Edition</i> , Packt Publishing | <input checked="" type="checkbox"/> |
| Further        | McGrath, M (2018) <i>Python in Easy Steps, 2<sup>nd</sup> Edition</i> , In Easy Steps Limited                                                                                          | <input checked="" type="checkbox"/> |

|                       |                                         |
|-----------------------|-----------------------------------------|
| <b>Module Code</b>    | <b>ACCA4021</b>                         |
| <b>Title</b>          | <b>Introduction to Computer Systems</b> |
| <b>Date</b>           | <b>14/05/2020</b>                       |
| <b>Level</b>          | <b>4</b>                                |
| <b>Credits</b>        | <b>20</b>                               |
| <b>Pre-Requisites</b> | <b>None</b>                             |

### **AIM(S)**

- To provide students with a fundamental understanding of the key components and characteristics of computer systems.

### **LEARNING OUTCOMES**

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

- Understand computer hardware, operating systems and computer networking principles.
- To install and manage a networked computer and a range of software applications.

### **INDICATIVE CONTENT**

- Operating systems. Processes, services and applications. User management. OS commands.
- Computer networks, network cards, Ethernet cable, etc. RJ45 sockets, jacks and wiring, 4-port Ethernet switches.
- File systems e.g. files, folders, file name extensions, etc.
- Components of PC, processors, memory, motherboard, motherboard interfaces, e.g. PCI, PCI Express, and AGP.
- Security, personal firewalls, anti-virus software and software patches.
- Installing and configuring applications, windows registry, user rights, etc.
- The role of a network administrator
- Internet access, Broadband Routers, Internet Service Providers, DHCP, etc.
- Disposing of computer equipment, environmental, privacy and security implications

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| Exam               | 1 hour | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written Assessment | 1500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4021                                                                                                                                                                             |                                     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Introduction to Computer Systems                                                                                                                                                     |                                     |
| Classification | Reading List entry                                                                                                                                                                   | Electronic*                         |
| Essential      | Bott, E, Stinson, T (2018) Windows 10 Inside Out, Microsoft Press                                                                                                                    | <input checked="" type="checkbox"/> |
| Essential      | Stallings, W (2012) Computer Organization and Architecture: Designing for Performance, Pearson Education                                                                             | <input type="checkbox"/>            |
| Further        | Patterson, D A (2016) Computer Organization and Design: The Hardware/Software Interface (The Morgan Kaufmann Series in Computer Architecture and Design), Morgan Kaufmann Publishers | <input checked="" type="checkbox"/> |
| Further        | Tanenbaum, A S, Bot, H, (2014) Modern Operating Systems, 4 <sup>th</sup> Edition, Prentice Hall                                                                                      | <input type="checkbox"/>            |
| Further        | Tanenbaum, A (2013) Computer Networks, Prentice Hall                                                                                                                                 | <input type="checkbox"/>            |

|                       |                                                    |
|-----------------------|----------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4022</b>                                    |
| <b>Title</b>          | <b>Computer Architecture and Operating Systems</b> |
| <b>Date</b>           | <b>09/09/2020</b>                                  |
| <b>Level</b>          | <b>4</b>                                           |
| <b>Credits</b>        | <b>20</b>                                          |
| <b>Pre-Requisites</b> | <b>None</b>                                        |

### **AIM(S)**

- To provide the student with a fundamental grounding in the key concepts behind typical computer architectures, hardware, networks and operating systems.

### **LEARNING OUTCOMES**

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

- Determine the essential characteristics and concepts behind computer systems and components, number systems, data capacities and transfer speeds, in the context of typical PC hardware and networking environments.
- Demonstrate an understanding of general Operating System concepts.

### **INDICATIVE CONTENT**

- Fundamentals of number systems. Binary, Dec and Hex notation, representation and conversion.
- Computer systems: major components and peripherals.
- Storage devices. Optical, HDD, SSD, RAID configurations etc.
- Nomenclature and specification of typical data capacities and transfer speeds
- Processor characteristics: RISC, CISC, multi-core etc.
- Computer architecture: system block diagram, CPU, memory, input/output unit, system clock, data bus, address bus, control bus, Harvard vs Von-Neumann etc.
- Memory Organisation: Main RAM, cache, virtual memory etc
- Input/output including polled, interrupts and direct memory access.
- Networking hardware and introduction to networking principles.
- OS fundamentals
- Privileges and permissions
- File system structures, navigation, viewing and editing files and scripts

### **Study Time Allocation**

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam**      ☐ **Coursework**      ☐ **Practical**

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Exam               | 2 hours | 50%       |

### Assessment Component 2

☐ **Written exam**      ☒ **Coursework**      ☐ **Practical**

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Assignment         | 2500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4022                                                                                                                                        |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Computer Architecture and Operating Systems                                                                                                     |                                     |
| Classification | Reading List entry                                                                                                                              | Electronic*                         |
| Essential      | W Stallings, Computer Organization and Architecture (10th Ed), Pearson, 2016                                                                    | <input type="checkbox"/>            |
| Essential      | I Englander, The architecture of Computer Hardware, Systems Software & Networking – An Information Technology Approach, John Wiley & sons, 2014 | <input type="checkbox"/>            |
| Essential      | E Siever, Linux in a nutshell, O'Reilly 2009                                                                                                    | <input checked="" type="checkbox"/> |
| Further        | <a href="https://www.tomshardware.com/uk">https://www.tomshardware.com/uk</a>                                                                   | <input checked="" type="checkbox"/> |
| Further        | <a href="https://www.anandtech.com/">https://www.anandtech.com/</a>                                                                             | <input checked="" type="checkbox"/> |
| Further        | J O'Gorman, Operating systems with Linux, Palgrave 2001                                                                                         | <input type="checkbox"/>            |
| Further        | S Mueller, Upgrading and repairing PCs, Que 2015                                                                                                | <input type="checkbox"/>            |

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4023</b>                                  |
| <b>Title</b>          | <b>Introduction to Web and Database Concepts</b> |
| <b>Date</b>           | <b>09/09/2020</b>                                |
| <b>Level</b>          | <b>4</b>                                         |
| <b>Credits</b>        | <b>20</b>                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                      |

### AIM(S)

- To provide students with an understanding of the underlying concepts and principles needed to design and implement relational databases and build and render web pages.

### LEARNING OUTCOMES

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

- Demonstrate a systematic understanding and application of the fundamental concepts, technologies, and standards required for building and rendering web pages.
- Demonstrate a systematic understanding of the underlying concepts of data and databases, and the methodology of database design. Apply appropriate systems investigation and analysis techniques to design and implement relational database solutions.

### INDICATIVE CONTENT

- Data, Databases and Database Management Systems (DBMS).
- Conceptual, logical and physical database design. Database design and entity analysis techniques.
- Entity-relationship models: entities, relationships, attributes and integrity constraints.
- Relational database implementation using DBMS software and Structured Query Language (SQL).
- Core technologies for building and rendering web pages i.e. HTML, CSS.
- Web content, including text, graphics, media content, hypertext and hypermedia, web forms, etc.
- Fundamental standards and principles of web design and applications i.e. interface and layout design principles, mobile web and device-independent web practices, web accessibility, etc.
- Web evaluation techniques and tools e.g. standards validation, browser evaluation tools, accessibility evaluation, and performance assessment.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume         | Weighting |
|--------------------|----------------|-----------|
| Portfolio          | 2 - 3 elements | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume         | Weighting |
|--------------------|----------------|-----------|
| Portfolio          | 2 - 3 elements | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4023                                                                                                                                                       |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Introduction to Web and Database Concepts                                                                                                                      |                                     |
| Classification | Reading List entry                                                                                                                                             | Electronic*                         |
| Essential      | Connolly, T., Begg, C., 2015, <i>Database Systems: A Practical Approach to Design, Implementation and Management</i> , 6th Edition, Addison Wesley             | <input checked="" type="checkbox"/> |
| Essential      | Viescas, J. L., 2018, <i>SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL</i> , 4 <sup>th</sup> Edition, Addison-Wesley Professional | <input checked="" type="checkbox"/> |
| Essential      | Robbins, J., 2018, <i>Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics</i> , O'Reilly Media                                  | <input checked="" type="checkbox"/> |
| Further        | Duckett, J., 2014, <i>Web Design with HTML, CSS, JavaScript and jQuery Set</i> , Wiley                                                                         | <input checked="" type="checkbox"/> |
| Further        | Coronel, C. & Morris, S., 2018, <i>Database Systems: Design, Implementation, &amp; Management</i> , 13 <sup>th</sup> Edition, Cengage Learning                 | <input checked="" type="checkbox"/> |

|                       |                                               |
|-----------------------|-----------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4024</b>                               |
| <b>Title</b>          | <b>Networks and Cyber Security Essentials</b> |
| <b>Date</b>           | <b>09/09/2020</b>                             |
| <b>Level</b>          | <b>4</b>                                      |
| <b>Credits</b>        | <b>20</b>                                     |
| <b>Pre-Requisites</b> | <b>None</b>                                   |

### **AIM(S)**

- To provide the students with an understanding of the key concepts and fundamentals of data communications, computer networks and security of data and devices in a network.

### **LEARNING OUTCOMES**

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

- Develop fundamental understanding of network basics in terms of architecture, devices, application and protocols.
- Demonstrate systematic understanding of security policies and measures to mitigate internal and external attacks and threats in a network.

### **INDICATIVE CONTENT**

- Fundamentals of networks, circuit and packet switching
- Communication on a network
- Client server model
- OSI and TCP/IP Models
- Types of Networks – LAN, WAN, MAN, SAN, etc
- Physical and logical addressing
- Wireless networks and standards
- Cyber Security – attacks, access control, encryption, cryptography
- Importance of data security
- System security – firewalls, threats, intruders and malicious software

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                | Weighting |
|--------------------|-----------------------|-----------|
| Portfolio          | 2000 words equivalent | 50%       |

### Assessment Component 2

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| in-class test      | 1 hour | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4024                                                                                                                            |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Networks and Cyber Security Essentials                                                                                              |                                     |
| Classification | Reading List entry                                                                                                                  | Electronic*                         |
| Essential      | William Stallings (2014) Data and Computer Communications, 10th Edition, Pearson                                                    | <input checked="" type="checkbox"/> |
| Essential      | www.netacad.com<br>Username and password required                                                                                   | <input checked="" type="checkbox"/> |
| Essential      | William Stallings (2017) Network Security Essentials: Applications and Standards, 6th Edition, Pearson                              | <input checked="" type="checkbox"/> |
| Further        | J. S. Beasley & P. Nilkaew (2018) Networking Essentials: A CompTIA Network+ N10-007 Textbook, 5th Edition, Pearson IT Certification | <input checked="" type="checkbox"/> |
| Further        | IEEE/ACM, IEEE/ACM Transactions on Networking                                                                                       | <input checked="" type="checkbox"/> |
| Further        | IEEE, IEEE Network Magazine                                                                                                         | <input checked="" type="checkbox"/> |
| Further        | Science Direct                                                                                                                      | <input checked="" type="checkbox"/> |
| Further        | Scopus                                                                                                                              | <input checked="" type="checkbox"/> |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Module Code</b>    | <b>ACCA4025</b>                    |
| <b>Title</b>          | <b>Learning in the Digital Era</b> |
| <b>Date</b>           | <b>25/06/2020</b>                  |
| <b>Level</b>          | <b>4</b>                           |
| <b>Credits</b>        | <b>20</b>                          |
| <b>Pre-Requisites</b> | <b>None</b>                        |

### **AIM(S)**

- To develop student's skills for independent study and life-long learning, which will form the foundations for successful completion of their degree programme and support future employment opportunities.

### **LEARNING OUTCOMES**

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

- Demonstrate the foundational skills required to be a resilient and healthy independent learner.
- Practise the principles of learning agility
- Use suitable technology to support and enhance their learning experience within the discipline area

### **INDICATIVE CONTENT**

- Time management, reading, writing, referencing and plagiarism, searching for and evaluating sources of information, working online.
- Critical thinking: issues concerning knowledge, belief, and doubt.
- Critical writing: synthesis, paraphrasing and creating an informed argument, avoiding plagiarism.
- Reflection and self-reflection.
- Identity and sense of place; including values, culture and intercultural awareness, heritage, diversity and inclusion and, multilingualism.
- Skills for a range of assessment modes, including blogs, vlogs, video, presentations, performances, posters, exams and written coursework.
- Skills and attitudes which underpin resilience, health, wellbeing and learning agility; the role of spirit, mind, emotions and body.
- Physical literacy: Consideration of the role of physical activity to the support of physical, mental health, well-being and resilience.
- Digital literacy: using appropriate technology; staying safe online, cyber security, digital identity.
- Team working.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                    | Weighting |
|--------------------|---------------------------|-----------|
| E-portfolio        | Equivalent to 2,000 words | 50%       |

### Assessment Component 2

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment             | Volume                                                            | Weighting |
|--------------------------------|-------------------------------------------------------------------|-----------|
| Video and Supporting Materials | Individual 3 minute video which incorporates supporting materials | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

This will be guided by the student's subject area.

|                       |                                                                                                                                                          |                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCA4025                                                                                                                                                 |                                     |
| <b>Module Title</b>   | Learning in the Digital Era                                                                                                                              |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                | <b>Electronic*</b>                  |
| Essential             | Cottrell, S (2019) <i>The Study Skills Handbook</i> . 5th edn. London: Macmillan International Higher Education.                                         | <input checked="" type="checkbox"/> |
| Essential             | Pears, R. and Shields, G.J. (2019) <i>Cite Them Right: the essential referencing guide</i> . 11th edn. London: Macmillan International Higher Education. | <input checked="" type="checkbox"/> |
| Essential             | Library Info Skills Sessions                                                                                                                             | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                |                          |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Hopkins, D. and Reid, T., 2018. <i>The Academic Skills Handbook: Your Guide to Success in Writing, Thinking and Communicating at University</i> . London: Sage | <input type="checkbox"/> |
| Further | Osmond, A., 2016. <i>Academic Writing and Grammar for Students</i> 2 <sup>nd</sup> edn. London: SAGE.                                                          | <input type="checkbox"/> |

|                       |                                      |
|-----------------------|--------------------------------------|
| <b>Module Code</b>    | <b>ACCA4028</b>                      |
| <b>Title</b>          | <b>Computer Systems Fundamentals</b> |
| <b>Date</b>           | <b>24/02/2021</b>                    |
| <b>Level</b>          | <b>4</b>                             |
| <b>Credits</b>        | <b>10</b>                            |
| <b>Pre-Requisites</b> | <b>None</b>                          |

### AIM(S)

- To provide students with an essential understanding of the key components and characteristics of computer systems.

### LEARNING OUTCOMES

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

- Demonstrate a knowledge of the underlying concepts and principles of computer hardware, operating systems and cyber security.

### INDICATIVE CONTENT

- Components of PC, processors, memory, motherboard, motherboard interfaces, e.g. PCI, PCI Express, and AGP.
- Operating systems. Processes, services and applications. User management. OS commands.
- Computer networks, network cards, Ethernet cable, etc. RJ45 sockets, jacks and wiring, 4-port Ethernet switches.
- File systems e.g. files, folders, file name extensions, etc.
- Installing and configuring applications, windows registry, user rights, etc.
- Internet access, Broadband Routers, Internet Service Providers, DHCP, etc.

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                                                                                                                                                                                                                                                             | Volume                 | Weighting |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------|
| Portfolio<br>Students will produce a portfolio of work appropriate to the nature of their area of study. Portfolio elements may include a selection of the following: <ul style="list-style-type: none"><li>• Written Report</li><li>• Hardware implementation</li></ul> Demonstration of work | 2,000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4028                                                                                                                      |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Computer Systems Fundamentals                                                                                                 |                                     |
| Classification | Reading List entry                                                                                                            | Electronic*                         |
| Essential      | Stallings, W (2016) Computer Organization and Architecture: Designing for Performance, 10 <sup>th</sup> Ed. Pearson Education | <input checked="" type="checkbox"/> |
| Essential      | <a href="http://www.netacad.net">www.netacad.net</a><br>username and password required                                        | <input checked="" type="checkbox"/> |
| Further        | Bott, E & Stinson, T (2019) Windows 10 Inside Out, 3 <sup>rd</sup> Ed, Microsoft Press                                        | <input checked="" type="checkbox"/> |
| Further        | Tanenbaum, A S, Bot, H, (2014) Modern Operating Systems, 4th Edition, Prentice Hall,                                          | <input type="checkbox"/>            |

|                       |                                  |
|-----------------------|----------------------------------|
| <b>Module Code</b>    | <b>ACCA4029</b>                  |
| <b>Title</b>          | <b>Cyber Security Essentials</b> |
| <b>Date</b>           | <b>24/02/2021</b>                |
| <b>Level</b>          | <b>4</b>                         |
| <b>Credits</b>        | <b>10</b>                        |
| <b>Pre-Requisites</b> | <b>None</b>                      |

### AIM(S)

- Students will learn how to protect their personal privacy and business information

### LEARNING OUTCOMES

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

- Demonstrate essential skills and an understanding of trends, threats and countermeasures for safer online and communication at workplace.

### INDICATIVE CONTENT

- Basics of information security
- Cyber Security – the need, attacks, concepts and techniques.
- Data protection and Privacy.
- Security, personal firewalls, anti-virus software and software patches.
- Most common threats, attacks and vulnerabilities
- Securing devices, information and users
- Disposing of computer equipment, environmental, privacy and security implications
- Basics of VPN

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| Online assessment  | 1 hour | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                        |                                     |
|-----------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA4029</b>                                                                                        |                                     |
| <b>Module Title</b>   | <b>Cyber Security Essentials</b>                                                                       |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                              | <b>Electronic*</b>                  |
| Essential             | <a href="http://www.netacad.net">www.netacad.net</a><br>username and password required                 | <input checked="" type="checkbox"/> |
| Further               | William Stallings (2017) Network Security Essentials: Applications and Standards, 6th Edition, Pearson | <input checked="" type="checkbox"/> |
| Further               | C J Brooks, C Grow, P Craig and D Short (2018) Cybersecurity Essentials, John Wiley & Sons, Inc        | <input checked="" type="checkbox"/> |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Module Code</b>    | <b>ACCA4030</b>             |
| <b>Title</b>          | <b>Digital Technologies</b> |
| <b>Date</b>           | <b>24/02/2021</b>           |
| <b>Level</b>          | <b>4</b>                    |
| <b>Credits</b>        | <b>10</b>                   |
| <b>Pre-Requisites</b> | <b>None</b>                 |

### AIM(S)

- To provide students with knowledge and practical skills in a range of industry standard digital technologies to support effective and efficient work-flow.

### LEARNING OUTCOMES

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

- Demonstrate essential knowledge and skills to use software packages and applications to support day-to-day business operations.

### INDICATIVE CONTENT

- Working with personal computers, tablets and mobile devices
- Operating system: Windows, Mac, OS, Android, Linux, etc
- Internet and web technologies
- software packages and installations
- Office software products
- Emails and other communication tools
- Online collaboration tools - SharePoint, Skype for Business, MS Teams.
- Remote working and VPN
- Data storage, security and compliance
- Latest trends

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                                                                                                                                                                                                                                                                         | Volume                 | Weighting |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------|
| Portfolio<br>Students will produce a portfolio of work appropriate to the nature of their area of study. Portfolio elements may include a selection of the following: <ul style="list-style-type: none"> <li>• Written Report</li> <li>• Software implementation</li> <li>Demonstration of work</li> </ul> | 2,000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                                                                                                                                                        |                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA4030</b>                                                                                                                                                                                                                        |                                     |
| <b>Module Title</b>   | <b>Digital Technologies</b>                                                                                                                                                                                                            |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                                                                              | <b>Electronic*</b>                  |
| Essential             | J. T. Campbell, S. M. Freund, M. Frydenberg, M. Z. Last, P. J. Pratt, S. L. Sebok, M. E. Vermaat (2017) Shelly Cashman Series Discovering Computers & Microsoft Office 365 & Office 2016: A Fundamental Combined Approach, 1st Edition | <input checked="" type="checkbox"/> |
| Further               | P. Carey, K. T. Pinard, A. Shaffer, M. Shellman, S. Vodnik (2020) New Perspectives Microsoft Office 365 & Office 2019 Introductory, 1st Edition                                                                                        | <input checked="" type="checkbox"/> |

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>Module Code</b>    | <b>ACCA4031</b>                       |
| <b>Title</b>          | <b>Software and Apps for Business</b> |
| <b>Date</b>           | <b>24/02/2021</b>                     |
| <b>Level</b>          | <b>4</b>                              |
| <b>Credits</b>        | <b>10</b>                             |
| <b>Pre-Requisites</b> | <b>None</b>                           |

### AIM(S)

- To give students both a theoretical and a practical understanding and knowledge of various software and applications used within Businesses.

### LEARNING OUTCOMES

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

- Demonstrate knowledge and skills to use software packages and applications to support day-to-day business operations.

### INDICATIVE CONTENT

- Essential software for businesses operation
- Office software packages
- Documentation – create, format, tables, pictures, mail merge,
- Spreadsheets & Macros
- Emails and other communication tools
- PowerPoint Presentations
- Online collaboration tools - SharePoint, Skype for Business, MS Teams.
- Working with pdf
- Database concepts

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                                                                                                                                                                                                                                                                                                                   | Volume                 | Weighting |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------|
| Portfolio<br>Students will produce a portfolio of work appropriate to the nature of their area of study. Portfolio elements may include a selection of the following: <ul style="list-style-type: none"> <li>• Written Report</li> <li>• Presentation slides</li> <li>• Software/hardware implementation</li> <li>• Demonstration of work</li> </ul> | 2,000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4031                                                                                                                                                                                                                               |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Software and Apps for Business                                                                                                                                                                                                         |                                     |
| Classification | Reading List entry                                                                                                                                                                                                                     | Electronic*                         |
| Essential      | J. T. Campbell, S. M. Freund, M. Frydenberg, M. Z. Last, P. J. Pratt, S. L. Sebok, M. E. Vermaat (2017) Shelly Cashman Series Discovering Computers & Microsoft Office 365 & Office 2016: A Fundamental Combined Approach, 1st Edition | <input checked="" type="checkbox"/> |
| Essential      | P. Carey, K. T. Pinard, A. Shaffer, M. Shellman, S. Vodnik (2020) New Perspectives Microsoft Office 365 & Office 2019 Introductory, 1st Edition                                                                                        | <input checked="" type="checkbox"/> |
| Further        | S Baase & T. M. Henry (2018) Gift of Fire, A: Social, Legal, and Ethical Issues for Computing Technology, 5th Edition, Pearson                                                                                                         | <input checked="" type="checkbox"/> |

|                       |                                                                                                         |
|-----------------------|---------------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4032</b>                                                                                         |
| <b>Title</b>          | <b>Environment Design</b>                                                                               |
| <b>Date</b>           | <b>08/12/2021</b>                                                                                       |
| <b>Level</b>          | <b>4</b>                                                                                                |
| <b>Credits</b>        | <b>20</b>                                                                                               |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                             |
| <b>DBS Check</b>      | <b>May be required</b> <input type="checkbox"/> <b>Not required</b> <input checked="" type="checkbox"/> |

### AIM(S)

- To introduce students to 3D computer modelling techniques, using industry-standard software packages and/or specific development tools for the intention of creating small digital environments.
- To introduce the students to set dressing, framing, composition and creation of convincing and plausible environments for 3D virtual settings / locations.

### LEARNING OUTCOMES

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

- Apply appropriate 3D modelling and surface shading techniques in relation to environment design/creation.
- Demonstrate an understanding of set design, layout and construction in relation to a proposed idea.

### INDICATIVE CONTENT

- 3D modelling and surface shading for interior and exterior environments
- Digital paint over and concept techniques
- UV unwrapping methods for organic and inorganic environmental geometry
- Researching/Modelling props with stylised aesthetics
- Assembling a scene that conveys a theme and/or atmosphere by utilising and applying composition, colour and lighting techniques

### Study Time Allocation

The study time for the module is divided as follows:

| <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

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment      | Volume            | Weighting |
|-------------------------|-------------------|-----------|
| Live Group Presentation | 10 min per person | 100%      |

### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA4032                                                                                                                           |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Environment Design                                                                                                                 |                                     |
| Classification | Reading List entry                                                                                                                 | Electronic*                         |
| Essential      | Clarke, M. J. and Wang, C. (2020) Indie Games in the Digital Age. London: Bloomsbury Academic.                                     | <input type="checkbox"/>            |
| Essential      | Cabera, C. and Urschel, J. (2014) Digital Painting Techniques: Volume 6. 3DTotal Publishing.                                       | <input checked="" type="checkbox"/> |
| Essential      | Georgina, S. (2012) Designing for Screen: Production Design And Art Direction Explained. Marlborough: The Crowood Press Ltd        | <input type="checkbox"/>            |
| Essential      | Rogers, S. (2014) Level Up! The Guide to Great Video Game Design. London: Wiley                                                    | <input checked="" type="checkbox"/> |
| Further        | Reed, A. (2019) Adventure Games: Playing The Outsider. London: Bloomsbury Academic                                                 | <input type="checkbox"/>            |
| Further        | Perron, B. (2018) The World of Scary Video Games. London: Bloomsbury Academic.                                                     | <input type="checkbox"/>            |
| Further        | Perron, B. (2018) The World of Scary Video Games. London: Bloomsbury Academic.                                                     | <input type="checkbox"/>            |
| Further        | Voorhees, G., Call, J. and Whitlock, K. (2012) Guns, Grenades and Grunts: First-Person Shooter Games. London: Bloomsbury Academic. | <input type="checkbox"/>            |
| Further        | Bim, J. (2013) Digital Lighting And Rendering. London: New Riders.                                                                 | <input checked="" type="checkbox"/> |
| Further        | Kremers, R. (2009) Level Design: Concept, Theory, and Practice. London: A K Peters/CRC Press.                                      | <input type="checkbox"/>            |
| Further        | Winslow, C. (2006) The Handbook Of Set Design. Marlborough: The Crowood Press Ltd.                                                 | <input type="checkbox"/>            |
| Further        | <a href="http://gamasutra.com">http://gamasutra.com</a>                                                                            | <input checked="" type="checkbox"/> |
| Further        | <a href="https://www.youtube.com/user/3DBuzz">https://www.youtube.com/user/3DBuzz</a>                                              | <input checked="" type="checkbox"/> |
| Further        | <a href="http://www.develop-online.net/">http://www.develop-online.net/</a>                                                        | <input type="checkbox"/>            |

|                       |                                |
|-----------------------|--------------------------------|
| <b>Module Code</b>    | <b>ACCA4033</b>                |
| <b>Title</b>          | <b>Game Design and History</b> |
| <b>Date</b>           | <b>08/12/2021</b>              |
| <b>Level</b>          | <b>4</b>                       |
| <b>Credits</b>        | <b>20</b>                      |
| <b>Pre-Requisites</b> | <b>None</b>                    |

### **AIM(S)**

- To provide a historical overview and critique of the evolution of the computer and video games industry, issues of game quality, the social impact of games, demographics, and industry structure.
- Students will also be introduced to the principles and techniques of game design theory and the established frameworks of games development methodologies.

### **LEARNING OUTCOMES**

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

- Demonstrate a fundamental understanding of and reflection on the historical evolution of the games industry.
- Practically apply the theoretical content of the module to develop a Game Design Document to a professional level that will be used for future game development.

### **INDICATIVE CONTENT**

- Historical overview of games and the games business (Embryonic era, early home consoles, home computers, 8-bit, 16-bit, 32-bit, 64-bit, 128-bit, current generation)
- The role and impact of amusement arcades • Game platforms (e.g. traditional games, arcade games, portable games, internet games, multi-player games)
- Game design methodology and construction of a games design document
- Game taxonomies
- Play mechanics
- Player expectations
- Structure and responsibilities of a games development team

### **Study Time Allocation**

The study time for the module is divided as follows:

| <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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume      | Weighting |
|--------------------|-------------|-----------|
| Written report     | 2,000 words | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                             | Weighting |
|--------------------|------------------------------------|-----------|
| Written report     | 2,000 words (Game Design Document) | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4033                                                                                                                                               |                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Game Design and History                                                                                                                                |                          |
| Classification | Reading List entry                                                                                                                                     | Electronic*              |
| Essential      | Leaver, T. and Wilson, M. (2016) <i>Social, Casual and Mobile Games: The Changing Gaming Landscape</i> . Bloomsbury Academic.                          | <input type="checkbox"/> |
| Essential      | Donovan, T. (2010), <i>Replay: The History of Video Games</i> , Yellow Ant Media Ltd.                                                                  | <input type="checkbox"/> |
| Essential      | Wade, A. (2016), <i>Playback – A Genealogy of 1980s British Videogames</i> . London: Bloomsbury Academic.                                              | <input type="checkbox"/> |
| Essential      | Fullerton, T., Swain, C. and Hoffman, S. (2004), <i>Game Design Workshop: Designing, Prototyping and Playtesting Games</i> , San Francisco: CMP Books. | <input type="checkbox"/> |
| Essential      | Herman, L. (1997) <i>Phoenix: The Fall and Rise of Videogames</i> , Union, NJ: Rolenta Press.                                                          | <input type="checkbox"/> |
| Essential      | Kent, S. (2001) <i>The Ultimate History of Video Games</i> , New York: Three Rivers Press.                                                             | <input type="checkbox"/> |
| Essential      | Rogers, S. (2010), <i>Level Up! The Guide to Great Video Game Design</i> , Chichester: Wiley                                                           | <input type="checkbox"/> |
| Further        | Adams, E. and Rollings, A. (2007), <i>Game Design and Development. Fundamentals of Game Design</i> , Upper Saddle River, NJ: Pearson Education Inc.    | <input type="checkbox"/> |
| Further        | De Winter, J. (2015). <i>Shigeru Miyamoto: Super Mario Bros., Donkey Kong, The Legend of Zelda</i> . Bloomsbury Academic.                              | <input type="checkbox"/> |

|         |                                                                                                                                               |                                     |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Crawford, C. (2003), <i>Chris Crawford on Game Design</i> , Indiana: New Riders Publishing.                                                   | <input type="checkbox"/>            |
| Further | McGonigal, J. (2012), <i>Reality Is Broken: Why Games Make Us Better and How They Can Change the World</i> , London: Vintage.                 | <input type="checkbox"/>            |
| Further | Wolf, M. (Ed.) (2008), <i>The Video Game Explosion: A History from PONG to PlayStation and Beyond</i> , London: Greenwood.                    | <input type="checkbox"/>            |
| Further | Asakura, R. (2000), <i>Revolutionaries at Sony</i> , New York: McGraw-Hill.                                                                   | <input type="checkbox"/>            |
| Further | Ashcraft, B. and Snow, J. (2008), <i>Arcade Mania</i> , Tokyo: Kodansha.                                                                      | <input type="checkbox"/>            |
| Further | Kushner, D. (2004), <i>Masters of DOOM: How Two Guys Created an Empire and Transformed Pop Culture</i> , London: Piatkus.                     | <input type="checkbox"/>            |
| Further | Pettus, S. (2012), <i>Service Games: The Rise and Fall of Sega</i> , CreateSpace Independent Publishing.                                      | <input type="checkbox"/>            |
| Further | Salen, K. and Zimmerman, E. (2004), <i>Rules of Play: Game Design Fundamentals</i> , London: MIT.                                             | <input type="checkbox"/>            |
| Further | Sheff, D. (1999), <i>Game Over: How Nintendo Conquered the World</i> , Connecticut: GamePress.                                                | <input type="checkbox"/>            |
| Further | Schell, J. (2008), <i>The Art of Game Design: A Book of Lenses</i> , London: Morgan Kaufmann.                                                 | <input type="checkbox"/>            |
| Further | Takahashi, D. (2002), <i>Opening the Xbox. Inside Microsoft's Plan to Unleash an Entertainment Revolution</i> , California: Prima Publishing. | <input type="checkbox"/>            |
| Further | EDGE, Bath: Future Publishing.                                                                                                                | <input checked="" type="checkbox"/> |
| Further | <i>Games and Culture</i> , Thousand Oaks, CA.; London: Sage Publications.                                                                     | <input type="checkbox"/>            |
| Further | <i>MCV: The Interactive Entertainment Weekly</i> , Hertfordshire, Intent Media.                                                               | <input type="checkbox"/>            |
| Further | Game Developer <a href="https://www.gamedeveloper.com/">https://www.gamedeveloper.com/</a>                                                    | <input checked="" type="checkbox"/> |
| Further | Polygon <a href="https://www.polygon.com/">https://www.polygon.com/</a>                                                                       | <input checked="" type="checkbox"/> |

|                       |                                            |
|-----------------------|--------------------------------------------|
| <b>Module Code</b>    | <b>ADGD4005</b>                            |
| <b>Title</b>          | <b>Introduction to Character Animation</b> |
| <b>Date</b>           | <b>08/12/2021</b>                          |
| <b>Level</b>          | <b>4</b>                                   |
| <b>Credits</b>        | <b>20 credits</b>                          |
| <b>Pre-Requisites</b> | <b>None</b>                                |

### **AIM(S)**

- To provide the student with an understanding of animation principles and concepts within classical and digital animation techniques and how to communicate these effectively in a portfolio of motion studies.

### **LEARNING OUTCOMES**

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

- Understand the stages in presenting concepts of motion, performance, gesture and body mechanics to an audience and/or via player input notions;
- Demonstrate a range of approaches (traditionally and digitally) in capturing style, movement and setting within early stages of learning character animation.

### **INDICATIVE CONTENT**

- Observational analysis and recording of motion (life drawing, photography, film etc)
- Principles of Animation/Character Animation (e.g. pose to pose, slow-in, slow-out, etc.)
- Production based progression techniques (reference, thumbnails, storyboards, animatic, layout, etc.)
- Traditional drawn animation methods (e.g. via the production studio system roles)
- Model sheets and expression sheets
- An appreciation of forces and Newton's laws of motion
- An adoption of displaying weight and force and gravity – and how they influence performance/styles of character
- Introduction to animated cycles
- 2D & 3D computer animation approaches
- Timing for animation; screen/interactive timing
- Body mechanics, and animated turntables/moves in 3D space
- Key poses/gestures and acting/staging ideas

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                                                                                                              | Weighting |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Portfolio          | 3-4 elements eg creating animation material, methodology/process, short 5 mins (per person) presentation (equivalent to 4000 words) | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | <b>ADGD4005</b>                                                                                                                                                                               |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | <b>Introduction to Character Animation</b>                                                                                                                                                    |                                     |
| Classification | Reading List entry                                                                                                                                                                            | Electronic*                         |
| Essential      | Roberts, S. (2004) <i>Character Animation in 3D: Use Traditional Drawing Techniques to Produce Stunning CGI Animation</i> London: Focal Press                                                 | <input type="checkbox"/>            |
| Essential      | Johnson, O. and Thomas, F. (1995) <i>The Illusion Of Life: Disney Animation</i> London: Hyperion Press                                                                                        | <input type="checkbox"/>            |
| Essential      | Williams, R. (2002) <i>The Animator's Survival Kit: A Manual Of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators</i> London: Faber & Faber | <input type="checkbox"/>            |
| Further        | Cooper, J. (2019) <i>Game Anim: Video Game Animation Explained</i> London: A.K. Peters/CRC Press                                                                                              | <input checked="" type="checkbox"/> |
| Further        | Kerlow, I. V. (2009) <i>The Art of 3D Computer Animation and Effects</i> London: John Wiley & Sons                                                                                            | <input type="checkbox"/>            |
| Further        | Hooks, E. (2003) <i>Acting For Animators: A Complete Guide to Performance Animation</i> London: Heinemann                                                                                     | <input type="checkbox"/>            |
| Further        | Lasseter, J. (1987) <i>Principles Of Traditional Animation Applied To 3D Computer Animation</i> , Computer Graphics, Pp. 35-44, 21:4, July 1987 (SIGGRAPH 87)                                 | <input checked="" type="checkbox"/> |

|         |                                                                                                   |                                     |
|---------|---------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Living Lines Library<br><a href="https://livlily.blogspot.com/">https://livlily.blogspot.com/</a> | <input checked="" type="checkbox"/> |
| Further | Animation World Network<br><a href="https://www.awn.com/">https://www.awn.com/</a>                | <input checked="" type="checkbox"/> |
| Further | KUNDERT-GIBBS, J. (2009) <i>Action! Acting Lessons for CG Animators</i> London: John Wiley & Sons | <input type="checkbox"/>            |

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4034</b>                           |
| <b>Title</b>          | <b>Introduction to Virtual Production</b> |
| <b>Date</b>           | <b>08/12/2021</b>                         |
| <b>Level</b>          | <b>4</b>                                  |
| <b>Credits</b>        | <b>20</b>                                 |
| <b>Pre-Requisites</b> | <b>None</b>                               |

### AIM(S)

- To develop an understanding of digital filmmaking techniques and realtime rendering technologies in the production of shots, scenes and VFX
- To enable students to construct a production-based pipeline that allows for expansion of look development areas and cinematography

### LEARNING OUTCOMES

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

- Demonstrate effective decision-making and techniques in the construction and execution of digital visual artefacts in a production context
- Manipulate rendering technologies and studio-based methods in a live action vfx compositing context

### INDICATIVE CONTENT

- The art of film and animation
- Historical overviews on the arrival of on-set virtual production
- Analysis of studio roles, personnel and crews
- Traditional studio and real-world camera movements
- Film language, terms and composition
- Virtual development within the context of a sequential narratives
- Pitchvis, previs and techvis
- Identification of components and assets in film production scene developments
- Construction and implementation of 3D assets
- Integration of digital assets and fx within live action
- 3D workflows for look development and lighting
- Fully animated virtual production and alternatives
- Real-time physics, forces and forms

- Unreal engine and real-time vfx/animation production
- Asset tracking and management
- Virtual locations and environment constructions
- Iterative development and transitions on shots
- Compositing techniques
- Procedures in animation for creature fx in live action and cinematography
- Resolution, quality and exporting

### Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment                     | Volume  | Weighting |
|----------------------------------------|---------|-----------|
| VFX-based VP production & presentation | 12 mins | 70%       |

#### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment  | Volume      | Weighting |
|---------------------|-------------|-----------|
| Production Tracking | 1,000 words | 30%       |

#### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                                                                                                  |                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA4034</b>                                                                                                                                                                  |                                     |
| <b>Module Title</b>   | <b>Introduction to Virtual Production</b>                                                                                                                                        |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                        | <b>Electronic*</b>                  |
| Essential             | Murdock, K. (2020) <i>Autodesk Maya 2020</i> , London: SDC Publications.                                                                                                         | <input type="checkbox"/>            |
| Essential             | Jones, S. (2018) <i>Mechanical Creations in 3D: A Practical Look into Complex and Technical Setups for Animation &amp; VFX</i> , London: Chapman & Hall                          |                                     |
| Essential             | Shannon, T. (2017) <i>Unreal Engine 4 for Design Visualization: Developing Stunning Interactive Visualizations, Animations, and Renderings</i> , London: Pearson Education (US). | <input type="checkbox"/>            |
| Essential             | Gauthier, J-M. (2005) <i>Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film and the Web</i> , London: Routledge                               | <input type="checkbox"/>            |
| Further               | Tickoo, S. (2020) <i>Pixologic ZBrush 2020: A Comprehensive Guide</i> , CAD/CIM Technologies.                                                                                    | <input type="checkbox"/>            |
| Further               | Williams, E. (2021) <i>Virtual Reality Cinema: Narrative Tips and Techniques</i> London: Routledge                                                                               | <input type="checkbox"/>            |
| Further               | Falconer, D. (2017) <i>Middle-Earth: From Script to Screen: Building the World of The Lord of the Rings and The Hobbit</i> , London: Harper Collins                              | <input type="checkbox"/>            |
| Further               | Doyle, B. F. (2019) <i>Understanding Design in Film Production: Using Art, Light and Locations to Tell Your Story</i> , London: Routledge                                        | <input type="checkbox"/>            |
| Further               | Dunlop, R. (2014) <i>Production Pipeline Fundamentals for Film and Games</i> , London: Routledge                                                                                 | <input type="checkbox"/>            |
| Further               | <a href="#">Home Page - The Art of VFX</a>                                                                                                                                       | <input checked="" type="checkbox"/> |
| Further               | <a href="#">VFXWorld Magazine   Animation World Network (awn.com)</a>                                                                                                            | <input checked="" type="checkbox"/> |
| Further               | <a href="#">Art of LED Wall Virtual Production, Part One: 'Lessons from the Mandalorian' – fxguide</a>                                                                           | <input checked="" type="checkbox"/> |
| Further               | <a href="#">RealTime Conference: The World's Premiere Event for Real-Time Technologies</a>                                                                                       | <input checked="" type="checkbox"/> |

|                       |                       |
|-----------------------|-----------------------|
| <b>Module Code</b>    | <b>ACCA4035</b>       |
| <b>Title</b>          | <b>Visual Studies</b> |
| <b>Date</b>           | <b>08/12/2021</b>     |
| <b>Level</b>          | <b>4</b>              |
| <b>Credits</b>        | <b>20</b>             |
| <b>Pre-Requisites</b> | <b>None</b>           |

### AIM(S)

- To develop a technical and artistic awareness of the intrinsic relationship between observation, technique, process and ideas creation.
- To foster an expectation that the results of visual studies help to solve design problems, whilst being capable of existing as objects in their own right.

### LEARNING OUTCOMES

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

- Externalise, evidence and appraise the practices of visual studies.
- Consider new and innovative stylistic methods in the creation of conceptual design work.

### INDICATIVE CONTENT

- Form, function and modularity
- Composition and framing conventions
- Formal aspects e.g. rhythm, proportion, pace, temporality, line, value and texture
- Colour theory, typography, perspective and grids
- Exploration of impression as an interpretive response to stimuli
- Affordance, accessibility and Golden Ratio
- Analysis of character construction, with anatomical, proportional and stylistic considerations
- Animation, movement / motion, character exercises
- Storyboarding
- Matte Painting & Background imaging
- Professional design methods / techniques
- Observational analysis / timing through drawing, photography and motion capture

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam
 ☒ Coursework
 ☐ Practical

| Mode of assessment           | Volume                    | Weighting |
|------------------------------|---------------------------|-----------|
| Portfolio of visual material | Equivalent to 2,000 words | 50%       |

### Assessment Component 2

☐ Written exam
 ☐ Coursework
 ☒ Practical

| Mode of assessment | Volume                                                         | Weighting |
|--------------------|----------------------------------------------------------------|-----------|
| Presentation       | Individual 10-minute presentation to accompany visual material | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4035                                                                                                                       |                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Visual Studies                                                                                                                 |                          |
| Classification | Reading List entry                                                                                                             | Electronic*              |
| Essential      | Parr, P. (2018) <i>Sketching for Animation: Developing Ideas, Characters and Layouts in Your Sketchbook</i> London: Bloomsbury | <input type="checkbox"/> |
| Essential      | Deja, A. (2015) <i>Disney's Nine Old Men</i> London: Routledge                                                                 | <input type="checkbox"/> |
| Essential      | Mattesi, M. (2017) <i>Force: Dynamic Drawing for Animators</i> London: Focal Press                                             | <input type="checkbox"/> |
| Essential      | Winslow, V. (2015) <i>Classic Human Anatomy in Motion</i> London: Watson-Guptill                                               | <input type="checkbox"/> |

|           |                                                                                                                                |                                     |
|-----------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Essential | Nelson, M. (2019) <i>Creative World Building and Creature Design</i> London: Dover Publications                                | <input type="checkbox"/>            |
| Further   | Lasseter, J. (2017) <i>The Art of Coco</i> London: Chronicle Books                                                             | <input type="checkbox"/>            |
| Further   | Safadi, S. (2013) <i>Digital Painting Techniques: Volume 5</i> London: 3D Total Publishing                                     | <input type="checkbox"/>            |
| Further   | Bousquet, M. (2015) <i>Physics for Animators</i> London: CRC Press                                                             | <input type="checkbox"/>            |
| Further   | Suryavanshi, S. (2018) <i>Vision: Colour and Composition for Film</i> London: Laurence King                                    | <input type="checkbox"/>            |
| Further   | Ghez, D. (2018) <i>They Drew As They Pleased: Hidden Art Of Disney's Mid Century</i> (Vols. 1-4) London: Chronicle Books       | <input type="checkbox"/>            |
| Further   | 3DTotal Publishing (2018) <i>Digital Painting in Photoshop: Industry Techniques for Beginners</i> London: 3DTotal              | <input type="checkbox"/>            |
| Further   | <a href="http://livlily.blogspot.com">Living Lines Library (livlily.blogspot.com)</a>                                          | <input checked="" type="checkbox"/> |
| Further   | <a href="http://awn.com">Animation World Network   Celebrating the Art, Craft and Business of Animation (awn.com)</a>          | <input checked="" type="checkbox"/> |
| Further   | <a href="#">Animation for Beginners (Where do I start?)   Bloop Animation</a>                                                  | <input checked="" type="checkbox"/> |
| Further   | <a href="http://uniovi.es">Principles of Traditional Animation Applied to Computer Animation (uniovi.es)</a>                   | <input checked="" type="checkbox"/> |
| Further   | <a href="http://theanimatorssurvivalkit.com">The Animator's Survival Kit Animated - Buy DVDs (theanimatorssurvivalkit.com)</a> | <input checked="" type="checkbox"/> |

|                       |                               |
|-----------------------|-------------------------------|
| <b>Module Code</b>    | <b>ACCA4038</b>               |
| <b>Title</b>          | <b>Programming Essentials</b> |
| <b>Date</b>           | <b>04/08/2023</b>             |
| <b>Level</b>          | <b>4</b>                      |
| <b>Credits</b>        | <b>10</b>                     |
| <b>Pre-Requisites</b> | <b>None</b>                   |

### AIM(S)

- To provide students with a conceptual understanding of structural programming and the ability to design and program various applications.

### LEARNING OUTCOMES

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

- design and develop code using procedural programming concepts to solve specific problems critically evaluating the suitability of selected algorithms and data structures.

### INDICATIVE CONTENT

- Introduction to structural programming.
- Algorithm design – flow charts and pseudo-code.
- The programming environment – editor, compiler, debugger.
- Data types, variables, operators and control structures.
- Input/Output.
- Conditional statements.
- Looping structures.
- String manipulation.
- Functions.

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment    | Volume  | Weighting |
|-----------------------|---------|-----------|
| Proctored online exam | 2 hours | 100%      |

### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA4038                                                                                                 |                                     |
|----------------|----------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Programming Essentials                                                                                   |                                     |
| Classification | Reading List entry                                                                                       | Electronic*                         |
| Essential      | McGrath, M. (2022) <i>Python in Easy Steps</i> . In Easy Steps Publishing                                | <input checked="" type="checkbox"/> |
| Essential      | Cisco Networking Academy – Skills for All                                                                | <input checked="" type="checkbox"/> |
| Further        | Barry, P. (2023) <i>Head First Python 2e: A Brain-Friendly Guide</i> (2 <sup>nd</sup> edition): O'Reilly | <input checked="" type="checkbox"/> |
| Further        | Elder. (2019). <i>Python Programming for Everyone</i> . Packt Publishing.                                | <input type="checkbox"/>            |
| Further        | Lee, K. D. (2015) <i>Python Programming Fundamentals</i> . London: Springer London, Limited.             | <input type="checkbox"/>            |

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4039</b>                                                                                  |
| <b>Title</b>          | <b>Academic and Professional Development</b>                                                     |
| <b>Date</b>           | <b>18/10/2023</b>                                                                                |
| <b>Level</b>          | <b>4</b>                                                                                         |
| <b>Credits</b>        | <b>10</b>                                                                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                      |
| <b>DBS Check</b>      | <b>May be required <input type="checkbox"/> Not required <input checked="" type="checkbox"/></b> |

### AIM(S)

- To familiarise students with the key principles and standards of academic writing, and equip them with essential skills and knowledge required to excel in their academic studies and prepare them for their future professional endeavours.

### LEARNING OUTCOMES

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

- use critical thinking skills to assess the validity and reliability of sources and arguments;
- demonstrate the fundamental skills expected in an academic and professional environment, becoming a resilient learner.

### INDICATIVE CONTENT

- Importance of academic skills.
- Understanding academic writing.
- Overview of IEEE citation style.
- In-text citations and reference lists.
- Introduction to academic research.
- Evaluating sources for credibility and relevance.
- Library and online research tools.
- Plagiarism and its consequences.
- Avoiding academic misconduct.
- Developing critical thinking skills.
- Handling questions and feedback.
- Preparing and delivering academic presentations.
- Team dynamics in research projects.
- Collaborative tools and techniques.

- Referencing software and tools.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                | Weighting |
|--------------------|-----------------------|-----------|
| E-Portfolio/Blog   | 1000 words equivalent | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment | Volume           | Weighting |
|--------------------|------------------|-----------|
| Video Presentation | Approx 4 minutes | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4039                                                                                                                                                 |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Academic and Professional Development                                                                                                                    |                                     |
| Classification | Reading List entry                                                                                                                                       | Electronic*                         |
| Essential      | Cottrell, S. (2019) <i>The Study Skills Handbook</i> . 5th edn. London: Macmillan International Higher Education.                                        | <input checked="" type="checkbox"/> |
| Essential      | Pears, R. and Shields, G.J. (2019) <i>Cite Them Right: the essential referencing guide</i> . 11th edn. London: Macmillan International Higher Education. | <input checked="" type="checkbox"/> |
| Essential      | Library Info Skills Sessions.                                                                                                                            | <input checked="" type="checkbox"/> |
| Essential      | UWTSD – IEEE Referencing Handbook (2023).                                                                                                                | <input checked="" type="checkbox"/> |
| Essential      | UWTSD – Referencing and Plagiarism <a href="#">PowerPoint Presentation (uwtsd.ac.uk)</a> (2023).                                                         | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                            |                                     |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Hopkins, D. and Reid, T. (2018) <i>The Academic Skills Handbook: Your Guide to Success in Writing, Thinking and Communicating at University</i> . London: Sage.                            | <input type="checkbox"/>            |
| Further | Osmond, A. (2016) <i>Academic Writing and Grammar for Students 2<sup>nd</sup> edn</i> . London: SAGE.                                                                                      | <input type="checkbox"/>            |
| Further | UWTSD – Academic Misconduct Policy (2023).                                                                                                                                                 | <input checked="" type="checkbox"/> |
| Further | Sheehy, S. (2018) 'The case for curiosity-driven research'. TED Talk.                                                                                                                      | <input type="checkbox"/>            |
| Further | Moodie, A. (2017) 'The Secret to Student Success'. TEDx Talk.                                                                                                                              | <input type="checkbox"/>            |
| Further | Bhandari, H. D. and Melber, J. (2017) <i>Art/Work: Everything You Need to Know (and Do) as You Pursue Your Art Career</i> . New York, NY: Free Press, an imprint of Simon & Schuster, Inc. | <input type="checkbox"/>            |
| Further | Grant, D. (2022) <i>Business of Being an Artist: Sixth Edition</i> . Skyhorse Publishing Company, Incorporated.                                                                            | <input type="checkbox"/>            |

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4040</b>                                                                                  |
| <b>Title</b>          | <b>Animation Insights and Perspectives</b>                                                       |
| <b>Date</b>           | <b>18/10/2023</b>                                                                                |
| <b>Level</b>          | <b>4</b>                                                                                         |
| <b>Credits</b>        | <b>10</b>                                                                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                      |
| <b>DBS Check</b>      | <b>May be required <input type="checkbox"/> Not required <input checked="" type="checkbox"/></b> |

### AIM(S)

- To introduce students to study skills and visual literacy in the historical, cultural and technical significance of animation, VFX and related creative industries. It is to enable the student to investigate a deeper appreciation and understanding of the context behind the practical methods used on other modules and to identify the creative and technological evolution and changes associated with its development.

### LEARNING OUTCOMES

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

- demonstrate a growing awareness of the psychological and sociological impact of animation and the moving image, through the vehicle of media and mass communication;
- define meaning through animated art, its construction and its influence on people, on a variety of different levels.

### INDICATIVE CONTENT

- Historical timeline and development of animation and the moving image.
- Technological innovation and advancements in animation.
- The introduction and impact of sound.
- Studio development and film movements.
- Animation art, entertainment and innovation.
- Emergence of digital computer animation, VFX and 21st Century hybrids.
- Reading, interpreting and deconstructing imagery and sequences.
- Visual language components and interpretations (e.g. metaphor, mise-en-scene, semiotics).
- Genre, auteur, social representation and stereotyping.
- Types of messages: information and persuasion.
- Conferences, festivals and animation commissioning bodies and broadcasters.
- Studio systems, awards and the global diversity of animation.

- Innovative directors/animators/filmmakers.
- Animation pioneers, independent and the commercial / avant garde cinema.
- Postmodernism, propaganda, structuralism and realism.

### Study Time Allocation

The study time for the module is divided as follows:

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

### ASSESSMENT

#### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment           | Volume                                                                                         | Weighting |
|------------------------------|------------------------------------------------------------------------------------------------|-----------|
| Journal of research activity | Individual critical study on a selected title, with visuals (+ text), equivalent to 2000 words | 100%      |

#### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA4040                                                                                                                                                   |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Animation Insights and Perspectives                                                                                                                        |                                     |
| Classification | Reading List entry                                                                                                                                         | Electronic*                         |
| Further        | Kothenschulte, D. (2022) <i>The Walt Disney Film Archives: The Animated Movies 1921 – 1968</i> . Taschen.                                                  | <input type="checkbox"/>            |
| Further        | 50 most influential Animators: <a href="https://50mostinfluentialdisneyanimators.wordpress.com">https://50mostinfluentialdisneyanimators.wordpress.com</a> | <input checked="" type="checkbox"/> |
| Further        | National Film Board of Canada: <a href="http://nfb.ca">National Film Board of Canada (nfb.ca)</a>                                                          | <input checked="" type="checkbox"/> |
| Further        | Wells, P. (1998) <i>Understanding Animation</i> . Routledge.                                                                                               | <input type="checkbox"/>            |
| Essential      | Furniss, M. (2008) <i>Art in Motion: Animation Aesthetics</i> . John Libbey Publishing.                                                                    | <input type="checkbox"/>            |
| Essential      | Dobson, N. (2018) <i>The Animation Studies Reader</i> . Bloomsbury Academic.                                                                               | <input type="checkbox"/>            |
| Essential      | Batkin, J. (2017) <i>Identity in Animation: A Journey into self, difference, culture and the body</i> . Routledge.                                         | <input type="checkbox"/>            |

|         |                                                                                                                                                                                   |                                     |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Cavalier, S (2011) <i>The world history of animation</i> . University of California Press.                                                                                        | <input type="checkbox"/>            |
| Further | Brown, N. (2021) <i>Contemporary Hollywood Animation: Style, Storytelling, Culture and Ideology Since the 1990s (Traditions in American Cinema)</i> . Edinburgh University Press. | <input type="checkbox"/>            |
| Further | North, D. (2008) <i>Performing Illusions: Cinema, Special Effects and the Virtual Actor</i> . Wallflower Press.                                                                   | <input type="checkbox"/>            |
| Further | Bordwell, D. Thompson, K. (2019) <i>JSE Film Art: An Introduction</i> . McGraw Hill.                                                                                              | <input type="checkbox"/>            |
| Further | Baran, S. J. (2020) <i>JSE Introduction to Mass Communication</i> . McGraw Hill.                                                                                                  | <input type="checkbox"/>            |
| Further | Ed Hooks (Acting for Animation): <a href="http://www.edhooks.com/archives.html">http://www.edhooks.com/archives.html</a>                                                          | <input checked="" type="checkbox"/> |
| Further | Semiotics for Beginners: <a href="http://visual-memory.co.uk/Glossary">Semiotics for Beginners: Glossary (visual-memory.co.uk)</a> .                                              | <input checked="" type="checkbox"/> |
| Further | 50 most influential Animators: <a href="https://50mostinfluentialdisneyanimators.wordpress.com/">https://50mostinfluentialdisneyanimators.wordpress.com/</a>                      | <input checked="" type="checkbox"/> |
| Further | Animation World Network: <a href="https://www.awn.com/">https://www.awn.com/</a>                                                                                                  | <input checked="" type="checkbox"/> |

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4041</b>                                                                                  |
| <b>Title</b>          | <b>Games for Positive Impact</b>                                                                 |
| <b>Date</b>           | <b>18/10/2023</b>                                                                                |
| <b>Level</b>          | <b>4</b>                                                                                         |
| <b>Credits</b>        | <b>20</b>                                                                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                      |
| <b>DBS Check</b>      | <b>May be required <input type="checkbox"/> Not required <input checked="" type="checkbox"/></b> |

### AIM(S)

- To explore the potential of games as a medium for positive impact, focusing on the design and development of games that address social and environmental challenges.

### LEARNING OUTCOMES

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

- understand the principles of game design and its potential for positive impact;
- apply game development techniques to create games that address social and environmental challenges.

### INDICATIVE CONTENT

1. Introduction to Game Design:
  - Overview of game design principles and theories.
  - Understanding the elements of game mechanics, dynamics, and aesthetics.
  - Analysing games with positive impact and their design considerations.
2. Game Development Tools and Techniques:
  - Introduction to game development software and engines (e.g., Unity, Unreal Engine).
  - Implementing game mechanics and systems.
  - Balancing gameplay elements for engaging experiences.
  - Integrating narrative and game design for impactful storytelling.
3. Games for Social and Environmental Impact:
  - Exploring games that address social and environmental challenges.
  - Collaborative game design projects focusing on positive impact.
  - Evaluating the ethical considerations of game development.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                | Weighting |
|--------------------|---------------------------------------|-----------|
| Research portfolio | 2-3 elements (2,500 words equivalent) | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Pitch Presentation | 10 minutes | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4041                                                                                                                                                     |                                     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Games for Positive Impact                                                                                                                                    |                                     |
| Classification | Reading List entry                                                                                                                                           | Electronic*                         |
| Essential      | Fullerton, T., Swain, C., & Hoffman, S. (2024) <i>Game Design Workshop: A Playcentric Approach to Creating Innovative Games (Fifth Edition)</i> . CRC Press. | <input checked="" type="checkbox"/> |
| Essential      | Schell, J. (2019) <i>The Art of Game Design: A Book of Lenses (Third Edition)</i> . CRC Press.                                                               | <input checked="" type="checkbox"/> |
| Further        | Anetta, L. & Heneghan, J. (2008) <i>Serious Educational Games: From Theory to Practice</i> . Sense Publishers.                                               | <input type="checkbox"/>            |
| Further        | Edvarsden, F., & Kulle, H. (2010) <i>Educational Games: Design, Learning &amp; Applications</i> . Nova Science.                                              | <input type="checkbox"/>            |
| Further        | Denholm, J., & Lee-Davies, L. (2018) <i>Enhancing Education and Training Initiatives Through Serious Games</i> . IGI Global.                                 | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                              |                                     |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Fullerton, T., Swain, C., & Hoffman, S. (2024) <i>Game Design Workshop: A Playcentric Approach to Creating Innovative Games (Fifth Edition)</i> . CRC Press. | <input checked="" type="checkbox"/> |
| Further | Mosely, J., & Sonnet, H. (2006) <i>101 Games For Better Behaviour</i> . LDA.                                                                                 | <input type="checkbox"/>            |
| Further | Salen, K., & Zimmerman, E. (2019) <i>Rules of Play: Game Design Fundamentals (Second Edition)</i> . The MIT Press.                                           | <input checked="" type="checkbox"/> |

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4042</b>                                                                                  |
| <b>Title</b>          | <b>Introduction to 3D Modelling</b>                                                              |
| <b>Date</b>           | <b>18/10/2023</b>                                                                                |
| <b>Level</b>          | <b>4</b>                                                                                         |
| <b>Credits</b>        | <b>10</b>                                                                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                      |
| <b>DBS Check</b>      | <b>May be required <input type="checkbox"/> Not required <input checked="" type="checkbox"/></b> |

### AIM(S)

- To introduce students to the fundamentals of 3D modelling, providing them with the necessary skills and knowledge to create basic 3D models.

### LEARNING OUTCOMES

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

- demonstrate an understanding of the principles and techniques of 3D Modelling;
- create 3D models using industry-standard software.

### INDICATIVE CONTENT

#### 1. Introduction to 3D Modelling:

- Overview of the principles and concepts of 3D Modelling.
- Understanding different Modelling techniques (e.g., polygonal, spline-based).
- Introduction to industry-standard 3D Modelling software (e.g., Autodesk Maya, Blender).
- Navigating the 3D workspace and basic tools.

#### 2. Modelling Techniques:

- Creating and manipulating basic 3D shapes.
- Utilising transformation tools (e.g., scaling, rotation, translation).
- Applying modifiers and deformers to modify geometry.
- Introduction to texture mapping and UV unwrapping.

#### 3. Object Modelling:

- Modelling organic and inorganic objects.
- Constructing and refining complex shapes.
- Working with reference images and blueprints.
- Optimising models for efficiency and performance.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment     | Volume                                  | Weighting |
|------------------------|-----------------------------------------|-----------|
| 3D Modelling Portfolio | 3-4 components (2,500 words equivalent) | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA4042                                                                                                                                                                     |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Introduction to 3D Modelling                                                                                                                                                 |                                     |
| Classification | Reading List entry                                                                                                                                                           | Electronic*                         |
| Essential      | Derakhshani, D., & Derakhshani, R. (2019) <i>Introducing Autodesk Maya 2020: Autodesk Official Press</i> . Sybex.                                                            | <input checked="" type="checkbox"/> |
| Essential      | Lammers, R. (2020) <i>Learning Blender: A Hands-On Guide to Creating 3D Animated Characters</i> . Addison-Wesley Professional.                                               | <input checked="" type="checkbox"/> |
| Further        | Autodesk (2023) Maya Learning Channel. Available at: <a href="https://www.youtube.com/@Autodesk_Maya">https://www.youtube.com/@Autodesk_Maya</a> (Accessed: 28th July 2023). | <input checked="" type="checkbox"/> |
| Further        | Villar, F. (2021) <i>3D Modeling in Blender: Tools, Tips, and Tricks</i> . CRC Press.                                                                                        | <input checked="" type="checkbox"/> |

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA4043</b>                                                                                  |
| <b>Title</b>          | <b>VFX for Positive Impact</b>                                                                   |
| <b>Date</b>           | <b>18/10/2023</b>                                                                                |
| <b>Level</b>          | <b>4</b>                                                                                         |
| <b>Credits</b>        | <b>10</b>                                                                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                                                                      |
| <b>DBS Check</b>      | <b>May be required <input type="checkbox"/> Not required <input checked="" type="checkbox"/></b> |

### AIM(S)

- To equip students with a solid foundation in the principles, techniques, and applications of Visual Effects (VFX) across various media platforms. Through a balanced blend of theoretical understanding and practical application, students will develop the skills necessary to create and integrate visually captivating effects that enhance storytelling, visual aesthetics, and overall production quality.

### LEARNING OUTCOMES

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

- develop a solid grasp of the foundational principles and concepts of visual effects, including light, colour, motion, and perspective, and how they are applied in creating dynamic visual elements;
- apply a range of VFX techniques, such as compositing, particle effects, and motion tracking, to create realistic and imaginative visual effects that seamlessly blend with live-action footage;
- compile a comprehensive portfolio showcasing a diverse collection of visual effects projects that demonstrate their acquired skills, creativity, and growth as emerging VFX artists.

### INDICATIVE CONTENT

- Introduction to Visual Effects:
  - Overview of visual effects and their role in film and media.
  - Understanding the VFX pipeline and industry standards.
  - Exploring the ethical considerations in VFX creation.
- VFX Techniques and Tools:
  - Compositing techniques for integrating VFX elements.
  - Motion tracking and match moving.
  - Particle systems and simulations for creating dynamic effects.
  - Chroma keying and green screen techniques.
- Positive Impact and Storytelling:

- Analysing the impact of VFX in storytelling.
- Exploring case studies of positive and impactful VFX in films and media.
- Collaborative projects focusing on conveying positive messages through VFX.

### Study Time Allocation

The study time for the module is divided as follows:

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

### ASSESSMENT

#### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                             | Volume                                    | Weighting |
|----------------------------------------------------------------|-------------------------------------------|-----------|
| VFX shot between 30 and 60 seconds with associated PowerPoint. | PowerPoint presentation approx. 5 minutes | 100%      |

#### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA4043                                                                                                                                                  |                          |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | VFX for Positive Impact                                                                                                                                   |                          |
| Classification | Reading List entry                                                                                                                                        | Electronic*              |
| Essential      | Keller, E. (2019) <i>The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures</i> . Focal Press.                                | <input type="checkbox"/> |
| Essential      | Powell, D. (2018) <i>The Art of VFX: The Complete Guide to Visual Effects</i> . Sterling.                                                                 | <input type="checkbox"/> |
| Further        | Kerlow, I. (2015) <i>The Art of 3D Computer Animation and Effects</i> . Wiley.                                                                            | <input type="checkbox"/> |
| Further        | Dinur, Eran (2017) <i>The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers</i> . | <input type="checkbox"/> |
| Further        | Dinur, Eran (2021) <i>The Complete Guide to Photorealism for Visual Effects, Visualization and Games: For Visual Effects, Visualization and Games</i> .   | <input type="checkbox"/> |

|         |                                                                                                                        |                          |
|---------|------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Yot, Richard (2019) <i>Light for Visual Artists Second Edition: Understanding and Using Light in Art &amp; Design.</i> | <input type="checkbox"/> |
|---------|------------------------------------------------------------------------------------------------------------------------|--------------------------|

|                       |                                        |
|-----------------------|----------------------------------------|
| <b>Module Code</b>    | <b>ACCB4002</b>                        |
| <b>Title</b>          | <b>Data Analysis and Visualisation</b> |
| <b>Date</b>           | <b>09/09/2020</b>                      |
| <b>Level</b>          | <b>4</b>                               |
| <b>Credits</b>        | <b>20</b>                              |
| <b>Pre-Requisites</b> | <b>None</b>                            |

### AIM(S)

- To develop the knowledge and skills required to perform basic statistical analysis of experimental data.
- To introduce students to a wide variety of techniques used to display different types of data effectively. The student will learn to design data presentations for both static and interactive displays, both individual and team scenarios.

### LEARNING OUTCOMES

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

- Select and apply appropriate statistical methods for the analysis of well-defined problems.
- Demonstrate an ability to present nominal, ordinal, categorical and network data in forms that enable the easy understanding of the data
- Demonstrate an ability to rearrange data in order to extract hidden information
- Apply colour, position, size, shape and icons to encode information creatively and effectively to solve well-defined problems in information visualisation.

### INDICATIVE CONTENT

- Frequency distributions, descriptive statistics, the normal curve, percentiles and standard scores, hypothesis development, confidence limits
- Correlation coefficients, the t test, chi-square test
- Software for statistical analysis and data visualisation
- Different types of data; nominal, ordinal, categorical, network data; univariate, bivariate, trivariate, hypervariate data
- Appropriate display methods for differing data types; graphs, tables, icons.
- Histograms, boxplots, scatterplots, barcharts, parallel coordinate plots, maps
- Rearranging data to extract meaning from it; introducing distortion to provide clarity
- Identifying problems with visualisations

### Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 2000 words | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 2000 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCB4002                                                                                                            |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Data Analysis and Visualisation                                                                                     |                                     |
| Classification | Reading List entry                                                                                                  | Electronic*                         |
| Essential      | Kranzler, J.H. (2017) <i>Statistics for the Terrified</i> , Rowman & Littlefield.                                   | <input checked="" type="checkbox"/> |
| Essential      | Few, S. (2012), <i>Show Me The Numbers</i> , Analytics Press, Burlingame, CA.                                       | <input checked="" type="checkbox"/> |
| Further        | Schmuller, J. (2016), <i>Statistical Analysis With Excel For Dummies (4<sup>th</sup> Ed.)</i> , John Wiley and Sons | <input checked="" type="checkbox"/> |
| Further        | MacInnes, J. (2018), <i>Little Quick Fix: Know Your Numbers</i> , Sage,                                             | <input checked="" type="checkbox"/> |
| Further        | Spiegel, M.R (2014) <i>Shaum's Outline of Statistics, fifth ed.</i> , McGraw Hill Education Limited                 | <input checked="" type="checkbox"/> |
| Further        | Gonick, L & Smith, W. (2000) <i>Cartoon Guide to Statistics</i> , William Morrow Paperbacks                         | <input checked="" type="checkbox"/> |
| Further        | Spence, R. (2014), <i>Information Visualization: An Introduction</i> Prentice Hall                                  | <input type="checkbox"/>            |

|         |                                                                                                                |                          |
|---------|----------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Tufte, E. (2001) <i>The Visual Display of Quantitative Information (2<sup>nd</sup> Ed.)</i> Graphics Press USA | <input type="checkbox"/> |
| Further | Tufte, E. (1997), <i>Visual Explanations, Images and Quantities, Evidence and Narrative.</i> Graphics Press    | <input type="checkbox"/> |
| Further | Tufte, E. (1990) <i>Envisioning Information</i> , Graphics Press USA                                           | <input type="checkbox"/> |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Module Code</b>    | <b>ACCB4017</b>             |
| <b>Title</b>          | <b>Software Development</b> |
| <b>Date</b>           | <b>09/09/2020</b>           |
| <b>Level</b>          | <b>4</b>                    |
| <b>Credits</b>        | <b>20</b>                   |
| <b>Pre-Requisites</b> | <b>None</b>                 |

### **AIM(S)**

- To introduce students to software constructs and to the development of software using a high level programming language. Simple design concepts and good programming practice will be adopted.

### **LEARNING OUTCOMES**

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

- Understand the syntax and semantics of a high-level programming language and develop programs using good programming practices.
- Select and deploy basic software constructs using simple algorithms in the development of solutions to programming problems

### **INDICATIVE CONTENT**

- The software life cycle – analysis, design, implementation and maintenance.
- Algorithm design – flow charts and pseudo-code.
- The programming environment – editor, compiler, debugger.
- High level language programming syntax and semantics e.g. C, C++, C#, etc.
- Data types, variables, operators, control structures, data structures, functions.
- Software testing and debugging.
- Documentation including user guides, technical guides, etc.
- Introduction to problem solving techniques for well-defined problems e.g. interpreting natural language problem definitions, variable identification techniques, divide and conquer, etc.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                   | Volume                | Weighting |
|------------------------------------------------------|-----------------------|-----------|
| Programming assignment with associated documentation | 2800 words equivalent | 70%       |

### Assessment Component 2

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| In-class practical | 2 hours | 30%       |

### Assessment Summary

| Activity type | Percentage  |
|---------------|-------------|
| Written exam  | 0%          |
| Coursework    | 70%         |
| Practical     | 30%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

|                       |                                                                                                                                                                                                                                                                                                                                                                    |                          |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Module Code</b>    | ACCB4017                                                                                                                                                                                                                                                                                                                                                           |                          |
| <b>Module Title</b>   | Software Development                                                                                                                                                                                                                                                                                                                                               |                          |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                                                                                                                                                                                                          | <b>Electronic*</b>       |
| Essential             | Davenport, K. & Vine, M. (2014) <i>C Programming for the Absolute Beginner, 3<sup>rd</sup> Edition</i> , Cengage Learning PTR                                                                                                                                                                                                                                      | <input type="checkbox"/> |
| Essential             | McGrath, M. (2012) <i>C Programming In Easy Steps 4th Edition</i> , In Easy Steps Limited<br>Or 5 <sup>th</sup> edition (2018) Electronic only:<br><a href="http://ineasysteps.com/products-page/all-books/c-programming-easy-steps-5th-edition-ebook-pdf-2/">http://ineasysteps.com/products-page/all-books/c-programming-easy-steps-5th-edition-ebook-pdf-2/</a> | <input type="checkbox"/> |
| Further               | Greene, J. (2013) <i>Head First C#</i> , O'Reilly Media                                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> |

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>Module Code</b>    | <b>ACDA4004</b>                           |
| <b>Title</b>          | <b>Micros, Peripherals and Interfaces</b> |
| <b>Date</b>           | <b>13/10/2021</b>                         |
| <b>Level</b>          | <b>4</b>                                  |
| <b>Credits</b>        | <b>20</b>                                 |
| <b>Pre-Requisites</b> | <b>None</b>                               |

### AIM(S)

- To provide the student with an understanding of the underlying concepts and principles of Microprocessors, Microcontrollers and the associated peripheral modules and interfacing techniques used to create programmable systems capable of tasks such as monitoring, communication and control.

### LEARNING OUTCOMES

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

- Explain Microprocessor and Microcontroller features and architectures.
- Demonstrate an understanding of interfacing techniques and low level programming language skills
- Demonstrate an understanding of the fundamentals of digital electronics

### INDICATIVE CONTENT

- Microprocessor architectures (Von Neumann versus Harvard, microcontrollers, CISC, RISC).
- CPU features (interrupts, DMA, memory hierarchy, stack, queues, busses, memory management, cache etc).
- Microcontroller specific implementations e.g. in depth study of a specific PIC device and its associated in built modules.
- IDE use - Assembly language programming and testing.
- Parallel I/O – port buffering and signal conditioning. Tristate devices
- Serial I/O fundamentals – RS232, RS485, IIC, SPI etc
- A/D and D/A conversion
- PWM techniques
- Simple conditioning techniques for signal acquisition, smoothing, debounce etc.
- Basic power drive techniques, e.g. low current 5v to drive a power relay etc

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume      | Weighting |
|--------------------|-------------|-----------|
| Essay              | 2,000 Words | 50%       |

### Assessment Component 2

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Exam               | 2 hours | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4004                                                                                                                                      |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Micros, Peripherals and Interfaces                                                                                                            |                                     |
| Classification | Reading List entry                                                                                                                            | Electronic*                         |
| Essential      | Stokes, J. (2015) <i>Inside the Machine: An Illustrated Introduction to Microprocessors and Computer Architecture</i> London: No Starch Press | <input checked="" type="checkbox"/> |
| Essential      | Bates, M. P. (2011) <i>PIC Microcontrollers: An Introduction to Microelectronics</i> 3 <sup>rd</sup> ed Oxford: Newnes                        | <input checked="" type="checkbox"/> |
| Further        | Kumar, N. S., Saravanan, M., Jeevananthan, S. and Shah, S. (2012) <i>Microprocessors and Interfacing</i> OUP India                            | <input type="checkbox"/>            |
| Further        | Hwang, E. (2017) <i>Digital Logic and Microprocessor Design with Interfacing</i> ( International Edition) Boston, MA: Cengage Learning        | <input type="checkbox"/>            |
| Further        | Jones, B., Reese, R. and Bruce, J. (2014) <i>Microcontrollers: From Assembly Language to C Using</i>                                          | <input type="checkbox"/>            |

|         |                                                                                                                                  |                          |
|---------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|         | <i>the PIC24 Family</i> . 2 <sup>nd</sup> ed. Boston, MA: Cengage Learning                                                       |                          |
| Further | Kaler, R. S. (2013) <i>Microprocessors and Microcontrollers</i> 2 <sup>nd</sup> ed. New Delhi: IK International Publishing House | <input type="checkbox"/> |
| Further | Siegesmund, M. (2014) <i>Embedded C Programming: Techniques and Applications of C and PIC MCUS</i> Oxford: Newnes                | <input type="checkbox"/> |

|                       |                                             |
|-----------------------|---------------------------------------------|
| <b>Module Code</b>    | <b>ACDA4006</b>                             |
| <b>Title</b>          | <b>Electrical and Electronic Principles</b> |
| <b>Date</b>           | <b>15/08/2018</b>                           |
| <b>Level</b>          | <b>4</b>                                    |
| <b>Credits</b>        | <b>20</b>                                   |
| <b>Pre-Requisites</b> | <b>None</b>                                 |

### AIM(S)

- To provide the student with a sound knowledge of fundamental circuit/network analysis tools through real world component behaviour, and to apply these tools in a practical environment.

### LEARNING OUTCOMES

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

- Analyse specified circuits and networks using appropriate analysis tools such as PSpice.
- Perform electrical / electronic measurements, record and analyse data and produce a report.

### INDICATIVE CONTENT

- Ohm's Law
- Series/parallel connections for R, L and C
- KVL and KCL
- Potential and Current divider networks
- Voltage and Current sources
- Thevenin and Norton equivalent circuits
- Principle of Superposition
- Mesh and Nodal analysis
- AC fundamentals
- Sinusoidal properties
- Resistance, Reactance and Impedance
- Complex notation
- Single phase AC circuits
- Maximum Power Transfer

- Tuned Circuits
- Semiconductors, diodes and transistors, Thyristors, Diacs and Triacs
- Electromagnetism, Electromagnetic Induction, Faraday's, Lenz's Laws etc
- Principles of motors and generators

### Study Time Allocation

The study time for the module is divided as follows:

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

### ASSESSMENT

#### Assessment Component 1

☒ **Written exam**      ☐ **Coursework**      ☐ **Practical**

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Written exam       | 2 hours | 50%       |

#### Assessment Component 2

☐ **Written exam**      ☒ **Coursework**      ☐ **Practical**

| Mode of assessment | Volume      | Weighting |
|--------------------|-------------|-----------|
| Written lab report | 2,000 words | 50%       |

#### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACDA4006                                                                                    |                                     |
|----------------|---------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Electrical and Electronic Principles                                                        |                                     |
| Classification | Reading List entry                                                                          | Electronic*                         |
| Essential      | Bird, J. (2014) - <i>Electrical Circuit Theory and Technology</i> 5th Ed. London: Routledge | <input checked="" type="checkbox"/> |
| Further        | Floyd, T. L. (2012) <i>DC/AC Fundamentals: A Systems Approach</i> London: Prentice Hall     | <input type="checkbox"/>            |
| Further        | Sinclair, I. and Dutton, J. (2007) <i>Practical Electronics Handbook</i> , Oxford: Newnes   | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                                                                                                                                                                  |   |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Further | <b>Journals</b><br>Elektor<br>Electronics World<br>IEEE Xplore<br>ACM Digital Library                                                                                                                                                                                                                                            | ☒ |
| Further | <b>Websites</b><br>Various on-line video lectures<br>MIT Open Courseware <a href="http://vl.fmnet.info/safety/">http://vl.fmnet.info/safety/</a><br><a href="http://mingo.info-science.uiowa.edu/soft-eng/">http://mingo.info-science.uiowa.edu/soft-eng/</a><br><a href="http://www.fmeurope.org/">http://www.fmeurope.org/</a> | ☒ |

|                       |                    |
|-----------------------|--------------------|
| <b>Module Code</b>    | <b>ACDA4008</b>    |
| <b>Title</b>          | <b>Mathematics</b> |
| <b>Date</b>           | <b>15/08/2018</b>  |
| <b>Level</b>          | <b>4</b>           |
| <b>Credits</b>        | <b>20</b>          |
| <b>Pre-Requisites</b> | <b>None</b>        |

### AIM(S)

- To provide in-depth coverage of important mathematical ideas and techniques necessary for an understanding of the mathematics encountered in sister modules.

### LEARNING OUTCOMES

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

- Apply appropriate mathematical techniques to the solution of mathematical problems.

### INDICATIVE CONTENT

- Fundamental Algebra/Trigonometry: Solution of Equations, matrix methods, complex numbers.
- Vector Analysis: vector rules and notation as applied to static and dynamic vector quantities.
- The Calculus: the methods of differentiation and integration, partial differentiation, 1st order differential equations.
- Statistics: Probability theory and statistical analysis.

### Study Time Allocation

The study time for the module is divided as follows:

| <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 exam**      ☐ **Coursework**      ☐ **Practical**

| <b>Mode of assessment</b> | <b>Volume</b> | <b>Weighting</b> |
|---------------------------|---------------|------------------|
| Written exam              | 1.5 hours     | 50%              |

## Assessment Component 2

☒ **Written exam**      ☐ **Coursework**      ☐ **Practical**

| Mode of assessment | Volume    | Weighting |
|--------------------|-----------|-----------|
| Written exam       | 1.5 hours | 50%       |

## Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4008                                                                                                 |                                     |
|----------------|----------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Mathematics                                                                                              |                                     |
| Classification | Reading List entry                                                                                       | Electronic*                         |
| Essential      | Stroud, K. A. and Booth, D. J. (2013) <i>Engineering Mathematics</i> 7 <sup>th</sup> Ed London: Palgrave | <input type="checkbox"/>            |
| Further        | Bird, J. O. (2010) <i>Higher Engineering Mathematics</i> 8 <sup>th</sup> Ed Oxford: Newnes               | <input checked="" type="checkbox"/> |
| Further        | Singh, K. (2011) <i>Engineering Mathematics Through Applications</i> , London: Palgrave                  | <input type="checkbox"/>            |
| Further        | <b>Websites</b><br><a href="http://www.khanacademy.org">http://www.khanacademy.org</a>                   | <input type="checkbox"/>            |

|                       |                            |
|-----------------------|----------------------------|
| <b>Module Code</b>    | <b>ACDA4009</b>            |
| <b>Title</b>          | <b>Signals and Systems</b> |
| <b>Date</b>           | <b>13/10/2021</b>          |
| <b>Level</b>          | <b>4</b>                   |
| <b>Credits</b>        | <b>10</b>                  |
| <b>Pre-Requisites</b> | <b>None</b>                |

### AIM(S)

- To develop the student's knowledge of analogue and digital signals. Introducing the need for and implementation of simple signal conditioning in analogue circuits;;
- To develop a knowledge of point to point and multipoint communications, their protocols and the differences between them. ;

### LEARNING OUTCOMES

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

- Recognise, understand and evaluate different signal types and protocols;
- Define and implement a simple point to point signal mechanism suitable for a predetermined task

### INDICATIVE CONTENT

- Analogue signals and simple conditioning.
- Digital signal protocols for point to point communications.
- Digital signal protocols for multipoint communications.
- Simple hardware transmission systems.
- Differential hardware transmission systems.

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☒ **Written exam**                      ☐ **Coursework**                      ☐ **Practical**

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Exam               | 2 hours | 100%      |

### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | <b>ACDA4009</b>                                                                                                                              |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | <b>Signals and Systems</b>                                                                                                                   |                                     |
| Classification | Reading List entry                                                                                                                           | Electronic*                         |
| Essential      | Haykin, S. S. and Moher, M. (2006) <i>Introduction to Analog and Digital Communications</i> , Hoboken, NJ: Wiley                             | <input type="checkbox"/>            |
| Further        | Vetterli, M., Kovacevi, J. and Goyal, V. (2014) <i>Foundations of Signal Processing</i> , Cambridge: Cambridge University Press              | <input checked="" type="checkbox"/> |
| Further        | Pathan, A-S. K., Khan, S., and Alrajeh, N. A. (2016) <i>Wireless Sensor Networks: Current Status And Future Trends</i> Boca Raton: CRC Press | <input checked="" type="checkbox"/> |
| Further        | <b>Journals</b><br>IEEE Xplore<br>ACM Digital Library                                                                                        | <input checked="" type="checkbox"/> |

|                       |                   |
|-----------------------|-------------------|
| <b>Module Code</b>    | <b>ACDA4013</b>   |
| <b>Title</b>          | <b>Embedded C</b> |
| <b>Date</b>           | <b>13/10/2021</b> |
| <b>Level</b>          | <b>4</b>          |
| <b>Credits</b>        | <b>20</b>         |
| <b>Pre-Requisites</b> | <b>None</b>       |

### AIM(S)

- To introduce students to software constructs and to the development of software using the C programming language for embedded applications. Simple design concepts and good programming practice will be adopted.

### LEARNING OUTCOMES

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

- Understand the syntax and semantics of an embedded C program and develop programs using good programming practices.
- Select and deploy basic software constructs using simple algorithms in the development of solutions to embedded programming problems

### INDICATIVE CONTENT

- The software life cycle – analysis, design, implementation and maintenance
- Algorithm design – flow charts and pseudo-code
- The programming environment – editor, compiler, debugger, simulator
- Embedded C programming syntax
- Data types, variables, operators, control structures, data structures, functions
- Software testing and debugging
- Documentation including user guides, technical guides, etc.
- Introduction to problem solving techniques for requirements specification.

### Study Time Allocation

The study time for the module is divided as follows:

| <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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Assignment         | 1500 words | 50%       |

### Assessment Component 2

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| In-class practical | 2 hours | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4013                                                                                                                                          |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Embedded C                                                                                                                                        |                                     |
| Classification | Reading List entry                                                                                                                                | Electronic*                         |
| Essential      | Ward, H. H. (2020) <i>C Programming for the PIC Microcontroller: Demystify Coding with Embedded Programming</i> New York: APress/Springer Science | <input checked="" type="checkbox"/> |
| Essential      | Davenport, K. and Vine, M. (2014) <i>C Programming for the Absolute Beginner</i> Indianapolis: Cengage Learning PTR                               | <input checked="" type="checkbox"/> |
| Further        | Siegesmund, M. (2011) <i>Embedded C Programming: Techniques and Applications of C and PIC MCUS</i> Oxford: Newnes                                 | <input type="checkbox"/>            |
| Further        | Wilmshurst, T. (2009) <i>Designing Embedded Systems with PIC Microcontrollers: Principles and Applications</i> , Oxford: Newnes                   | <input type="checkbox"/>            |

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| <b>Module Code</b>    | <b>ACDA4018</b>                                          |
| <b>Title</b>          | <b>Fundamentals of Electrical and Electronic Systems</b> |
| <b>Date</b>           | <b>17/08/2022</b>                                        |
| <b>Level</b>          | <b>4</b>                                                 |
| <b>Credits</b>        | <b>10</b>                                                |
| <b>Pre-Requisites</b> | <b>None</b>                                              |

### **AIM(S)**

- To provide the student with a sound knowledge of fundamental of electrical and electronics system and to apply this knowledge in a practical environment.

### **LEARNING OUTCOMES**

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

- Perform electrical and/or electronic measurements, record and analyse data and produce a report.

### **INDICATIVE CONTENT**

- Ohm's Law
- Series/parallel connections for R,L and C
- KVL and KCL
- Potential and Current divider networks
- Voltage and Current sources
- AC fundamentals
- Sinusoidal properties
- Resistance, Reactance and Impedance
- Single phase AC circuits
- Maximum Power Transfer
- Tuned Circuits
- Semiconductors, diodes and transistors, Thyristors, Diacs and Triacs

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment           | Volume                 | Weighting |
|------------------------------|------------------------|-----------|
| Build a circuit with logbook | 2,000-words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4018                                                                                                                                                                                                                                                                                                                        |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Fundamentals of Electrical and Electronic Systems                                                                                                                                                                                                                                                                               |                                     |
| Classification | Reading List entry                                                                                                                                                                                                                                                                                                              | Electronic*                         |
| Essential      | Bird, J. (2014) <i>Electrical Circuit Theory and Technology</i> - 5 <sup>th</sup> ed, Abingdon-on-Thames : Routledge                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |
| Further        | Floyd, T.L. (2012) <i>DC/AC Fundamentals: A Systems Approach</i> , New Jersey : Prentice Hall                                                                                                                                                                                                                                   | <input type="checkbox"/>            |
| Further        | Sinclair, I. and Dutton, J. (2007) <i>Practical Electronics Handbook</i> , Oxford : Newnes                                                                                                                                                                                                                                      | <input checked="" type="checkbox"/> |
| Further        | <b>Journals</b><br>Elektor<br>Electronics World<br>IEEE Xplore<br>ACM Digital Library                                                                                                                                                                                                                                           | <input checked="" type="checkbox"/> |
| Further        | <b>Websites</b><br>Various online video lectures<br>MIT Open Courseware <a href="http://vl.fmnet.info/safety/">http://vl.fmnet.info/safety/</a><br><a href="http://mingo.info-science.uiowa.edu/soft-eng/">http://mingo.info-science.uiowa.edu/soft-eng/</a><br><a href="http://www.fmeurope.org/">http://www.fmeurope.org/</a> | <input checked="" type="checkbox"/> |

|                       |                          |
|-----------------------|--------------------------|
| <b>Module Code</b>    | <b>ACDA4019</b>          |
| <b>Title</b>          | <b>Principles of OME</b> |
| <b>Date</b>           | <b>17/08/2022</b>        |
| <b>Level</b>          | <b>4</b>                 |
| <b>Credits</b>        | <b>20</b>                |
| <b>Pre-Requisites</b> | <b>None</b>              |

### **AIM(S)**

- To develop in the student an understanding of the types of energetic materials, the purpose for which they are used, their safe handling, movement and their responses to different stimuli.

### **LEARNING OUTCOMES**

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

- Demonstrate knowledge and underlying concepts and principles of explosive types and their different requirements as part of an explosive train.
- Evaluate and apply the concepts and principles of explosives to design a suitable explosives train and reliably initiate OME devices safely and correctly.

### **INDICATIVE CONTENT**

- Types of explosives
- Hazards of explosives
- Principles of Initiators
- Pyrotechnic effects
- Principles of Propellants
- Boosters and Secondary explosives
- Explosives effects and OME natures
- Explosive train design
- Introduction to detonation and deflagration
- Reliability and ageing

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume      | Weighting |
|--------------------|-------------|-----------|
| Report             | 2,000 words | 50%       |

### Assessment Component 2

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Written Exam       | 2 hours | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4019                                                                                                                              |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Principles of OME                                                                                                                     |                                     |
| Classification | Reading List entry                                                                                                                    | Electronic*                         |
| Essential      | Akhavan, J. (2011) <i>The Chemistry of Explosives</i> , Cambridge : Royal Society of Chemistry                                        | <input checked="" type="checkbox"/> |
| Essential      | Meyer, R., Kohler, J. and Homburg, A. (2016) <i>Explosives</i> New Jersey : John Wiley                                                | <input checked="" type="checkbox"/> |
| Further        | Agrawal, J.P. (2010) <i>High Energy Materials</i> , New Jersey : John Wiley                                                           | <input type="checkbox"/>            |
| Further        | Klapötke, T.M. (2017) <i>Chemistry of High Energy Materials</i> , Berlin : de Gruyter                                                 | <input checked="" type="checkbox"/> |
| Further        | Maytas, R. and Pachman, J. (2013) <i>Primary Explosives</i> , New York : Springer                                                     | <input checked="" type="checkbox"/> |
| Further        | Janssen, T.J. (2011) <i>Explosive Materials: Classification, Composition and Properties</i> , Hauppauge, NY : Nova Science Publishers | <input type="checkbox"/>            |

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| <b>Module Code</b>    | <b>ACDA4020</b>                                  |
| <b>Title</b>          | <b>Human Factors in High Hazard Environments</b> |
| <b>Date</b>           | <b>11/07/2023</b>                                |
| <b>Level</b>          | <b>4</b>                                         |
| <b>Credits</b>        | <b>10</b>                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                      |

### **AIM(S)**

- To develop in the student an understanding of environmental, organisational, and job factors, and human and individual characteristics which influence behaviour at work in a way that can impact upon health and safety.

### **LEARNING OUTCOMES**

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

- demonstrate a knowledge and understanding of the underlying concepts and principles of human factors and how they can impact upon health and safety;
- evaluate and apply the concepts and principles of human factors in OME related scenarios to underpin safe systems of work.

### **INDICATIVE CONTENT**

- Introduction to human factors in the OME environment.
- Understanding human factors in occupational safety.
- Definitions, concepts and history.
- OME Human Factors, management and the organization.
- Human performance in OME operations.
- Fatigue and stress and how to manage them.
- Human information processing and operational decision-making.
- Human error and threat management.
- Threat and Error Management (TEM) in the work place.
- Resource management training.
- Automation in the workplace – do we need people within the system?
- The design of Standard Operating Procedures (SOPs) and checklists.
- Case Studies.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                 | Weighting |
|--------------------|------------------------|-----------|
| Report             | 2,000-words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4020                                                                                                                                                      |                          |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Human Factors in High Hazard Environments                                                                                                                     |                          |
| Classification | Reading List entry                                                                                                                                            | Electronic*              |
| Essential      | Flin, Rhona H. (2008) <i>Safety at the Sharp End – A guide to non-technical skills</i> . CRC Press, London.                                                   | <input type="checkbox"/> |
| Essential      | Dekker S. (2014) <i>The field guide to understanding human error</i> . Routledge, London.                                                                     | <input type="checkbox"/> |
| Essential      | Shorrock S. (2016) <i>Human Factors and Ergonomics in Practice – Improving system performance and human well-being in the real world</i> . Routledge, London. | <input type="checkbox"/> |

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACDA4021</b>                     |
| <b>Title</b>          | <b>Study Skills for Electronics</b> |
| <b>Date</b>           | <b>19/07/2023</b>                   |
| <b>Level</b>          | <b>4</b>                            |
| <b>Credits</b>        | <b>10</b>                           |
| <b>Pre-Requisites</b> | <b>None</b>                         |

### **AIM(S)**

- To provide students with the underlying strategies that can accelerate the learning process. Students will be encouraged to develop a reflective, active, positive approach to learning, and to take responsibility for their own learning.

### **LEARNING OUTCOMES**

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

- demonstrate transferable skills in a learning environment;
- apply an academic and professional approach to their studies.

### **INDICATIVE CONTENT**

- Defining success, personal inspiration motivation goals and values.
- Identifying skills e.g. self-evaluation, skills needed for higher education, transferable skills, action plans for personal development.
- Understanding the learning process e.g. definitions, the learning process, learning styles, self-belief confidence and positive engagement, reflection, life-long learning.
- Gathering relevant information e.g. note taking, using the library and online resources.
- Communicating and presenting information e.g. presentation techniques and styles.
- Academic and Professional writing e.g. planning and structuring reports, linking ideas, using facts, opinions, analytical thinking.
- Standard referencing systems e.g. Harvard and Numeric system.
- Revision and examination techniques e.g. preparation, organisation, memory aids.
- Successful Self-management e.g. time management, organising space and resources, positive attitude, emotional intelligence, managing change, stress management.
- Successful Problem-solving e.g. action-plans, solution-focused thinking, thinking outside the box, creative problem-solving techniques.
- People skills: evaluating people skills, collaboration & team-work, leadership.

- Professional legal and ethical issues related to Higher Education, Employment and Professional Practice.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 2000 Words | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4021                                                                                                                                                                           |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Study Skills for Electronics                                                                                                                                                       |                                     |
| Classification | Reading List entry                                                                                                                                                                 | Electronic*                         |
| Essential      | Cottrell, S. (2021) 4 <sup>th</sup> edition, <i>Skills for Success: Personal Development and Employability</i> , Palgrave Macmillan.                                               | <input checked="" type="checkbox"/> |
| Essential      | Smale, B. & Fowlie, J. (2015) 2 <sup>nd</sup> edition <i>How to Succeed at University: An Essential Guide to Academic Skills and Personal Development</i> , Sage Publications Ltd. | <input type="checkbox"/>            |
| Essential      | Cottrell, S., (2019) 5th edition, <i>The Study Skills Handbook</i> , Palgrave Macmillan.                                                                                           | <input checked="" type="checkbox"/> |
| Further        | Cottrell, S., (2017) 3 <sup>rd</sup> edition <i>Critical Thinking Skills: Developing Effective Analysis and Argument</i> , Palgrave Macmillan.                                     | <input checked="" type="checkbox"/> |
| Further        | Duquenoy, P. (2007) 1 <sup>st</sup> edition, <i>Ethical, Legal and Professional Issues in Computing</i> , Thomson Learning.                                                        | <input type="checkbox"/>            |
| Further        | Emden, J. & Becker, L. (2016) 3rd edition, <i>Presentation Skills for Students</i> , Palgrave Macmillan.                                                                           | <input type="checkbox"/>            |

|         |                                                                                                                                              |                                     |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Pears, R. & Shields, G. (2022) 12 <sup>th</sup> edition, <i>Cite Them Right: The Essential Referencing Guide</i> , Palgrave Macmillan.       | <input checked="" type="checkbox"/> |
| Further | Pedler, M., Burgoyne, J., Boydell, T. (2013) 6 <sup>th</sup> edition, <i>A Manager's Guide to Self Development</i> McGraw-Hill Professional. | <input type="checkbox"/>            |

|                       |                                        |
|-----------------------|----------------------------------------|
| <b>Module Code</b>    | <b>ACDA4022</b>                        |
| <b>Title</b>          | <b>Workshop Skills for Electronics</b> |
| <b>Date</b>           | <b>19/07/2023</b>                      |
| <b>Level</b>          | <b>4</b>                               |
| <b>Credits</b>        | <b>10</b>                              |
| <b>Pre-Requisites</b> | <b>None</b>                            |

### AIM(S)

- To allow the students to develop workshop skills and practices conducive to a safe productive working environment.

### LEARNING OUTCOMES

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

- apply workshop skills and demonstrate an understanding of components, practices, skills, safety, and standards;
- deploy test equipment to safely measure electrical and electronic quantities and to determine parameters within engineering systems.

### INDICATIVE CONTENT

- Workshop safety.
- Use of workshop tools and equipment.
- Use of oscilloscopes, function generators, multimeters etc.
- Component testing.
- Design and manufacture of an electronic assembly/sub-assembly using suitable design tools e.g. CAD.

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam                      ☒ Coursework                      ☐ Practical

| Mode of assessment                            | Volume                | Weighting |
|-----------------------------------------------|-----------------------|-----------|
| Coursework. e.g. Build a circuit with logbook | 2000 Words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDA4022                                                                                                      |                          |
|----------------|---------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Workshop Skills for Electronics                                                                               |                          |
| Classification | Reading List entry                                                                                            | Electronic*              |
| Essential      | Petruzzellis, T. (2004) 1 <sup>st</sup> edition, <i>Build Your Own Electronics Workshop</i> , McGraw Hill TAB | <input type="checkbox"/> |
| Essential      | In-house, PCB Design Notes, Workshop safety                                                                   | <input type="checkbox"/> |

|                       |                    |
|-----------------------|--------------------|
| <b>Module Code</b>    | <b>ACDB4003</b>    |
| <b>Title</b>          | <b>Mathematics</b> |
| <b>Date</b>           | <b>09/09/2020</b>  |
| <b>Level</b>          | <b>4</b>           |
| <b>Credits</b>        | <b>20</b>          |
| <b>Pre-Requisites</b> | <b>None</b>        |

### AIM(S)

- To provide in-depth coverage of important mathematical ideas, techniques and tools necessary to understand the mathematics encountered in computing and electronics topics.

### LEARNING OUTCOMES

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

- Apply appropriate mathematical techniques to the solution of mathematical problems.
- Use contemporary software tools to solve mathematical problems.

### INDICATIVE CONTENT

- Fundamental Algebra/Trigonometry: Solution of Equations
- Matrix methods
- Complex numbers
- logic
- Sets, relations and functions
- Combinatorial analysis
- Graph theory
- Logs, exponentials and powers
- Co-ordinate Systems
- Vector Analysis: vector rules and notation as applied to static and dynamic vector quantities.
- The Calculus: the methods of differentiation and integration, partial differentiation, 1st order differential equations.
- Statistics: Probability theory and statistical analysis.
- Use of technical computing tools (e.g. C++, Python, MATLAB, Octave) for:
  - Calculating
  - Visualising
  - Scripting

- Programming
- Solving equations

### Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Assignment         | 2000 words | 50%       |

#### Assessment Component 2

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Exam               | 2 hours | 50%       |

#### Assessment Summary

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

### INDICATIVE READING LIST

|                       |                                                                                                                           |                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACDB4003                                                                                                                  |                                     |
| <b>Module Title</b>   | Mathematics                                                                                                               |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                 | <b>Electronic*</b>                  |
| Essential             | Stroud, K.A. and Booth, D. J. (2013) Engineering Mathematics, Palgrave                                                    | <input checked="" type="checkbox"/> |
| Essential             | Moore, H. (2018) MATLAB for Engineers: Global Edition, 5 <sup>th</sup> Edition Pearson                                    | <input checked="" type="checkbox"/> |
| Further               | Stroud, K.A. and Booth, D. J. (2009) Foundation Mathematics, Palgrave                                                     | <input checked="" type="checkbox"/> |
| Further               | Verth, J.M and Bishop, L.M. (2015) Essential Mathematics for Games and Interactive Applications, Third Edition, CRC Press | <input checked="" type="checkbox"/> |

|           |                                                                                                      |                                     |
|-----------|------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further   | Palm, W.J. (2010) Introduction to MATLAB for Engineers, 3 <sup>rd</sup> Edition, McGraw-Hill         | <input checked="" type="checkbox"/> |
| Essential | Lengyel, E. (2016) Foundations of Game Engine Development, Volume 1: Mathematics, Terathon Software. | <input checked="" type="checkbox"/> |
| Further   | Singh, K. (2011) Engineering Mathematics through applications, Palgrave                              | <input type="checkbox"/>            |

|                       |                                          |
|-----------------------|------------------------------------------|
| <b>Module Code</b>    | <b>ACDB4005</b>                          |
| <b>Title</b>          | <b>Principles of Systems Engineering</b> |
| <b>Date</b>           | <b>17/08/2022</b>                        |
| <b>Level</b>          | <b>4</b>                                 |
| <b>Credits</b>        | <b>20</b>                                |
| <b>Pre-Requisites</b> | <b>None</b>                              |

### AIM(S)

- To provide the students with the principles and systematic underpinning concepts of the systems engineering

### LEARNING OUTCOMES

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

- Demonstrate an understanding of principles of systems engineering, including needs analysis, developing options, assessing risk and constraints.
- Communicate their knowledge of systems thinking and design approach.

### INDICATIVE CONTENT

- Systems and the Structure of Complex Systems.
- Systems Development Processes, including purpose, context and interaction.
- Engineering Design Methods and Tools
- Requirements Capture and Analysis.
- Functions and Functionality.
- Concept Design, including the relationship of System, Subsystem and component.
- Integration and Evaluation, Validation and Verification.
- Robust Design

### Study Time Allocation

The study time for the module is divided as follows:

| <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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                                                                                                                                                      | Weighting |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Portfolio          | The assignment will consist of a portfolio-based report on the design of a typical munition or related device, applying the principles of systems engineering (4,000 words) | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDB4005                                                                                                                                       |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Principles of Systems Engineering                                                                                                              |                                     |
| Classification | Reading List entry                                                                                                                             | Electronic*                         |
| Essential      | Kossiakoff, A., Sweet, W., Seymour, S. and Biemer, S. (2011) <i>Systems Engineering Principles and Practice</i> , New Jersey : Wiley-Blackwell | <input checked="" type="checkbox"/> |
| Essential      | Leveson, N.G and Moses, J. (2017) <i>Engineering a safer world: Systems thinking applied to safety (Engineering systems)</i> , MIT Press       | <input checked="" type="checkbox"/> |
| Further        | Blanchard, B. (2009) <i>Systems Engineering Management - 4<sup>th</sup> ed</i> , New Jersey : John Wiley                                       | <input type="checkbox"/>            |
| Further        | Kasser, J. (2013) <i>Holistic Thinking: Creating Innovative Solutions to Complex Problems</i> , CreateSpace Independent Publishing Platform    | <input type="checkbox"/>            |
| Further        | Hitchins, D.K. (2007) <i>System Engineering: A 21<sup>st</sup> century systems methodology</i> , Wiley. ISBN: 978-0-470-05856-5                | <input checked="" type="checkbox"/> |
| Further        | Checkland, P. (1999) <i>Systems Thinking, Systems practice: Includes a 30-year retrospective</i> , Wiley.                                      | <input checked="" type="checkbox"/> |
| Further        | Ramage, M. and Shipp, K. (2009) <i>Systems Thinkers</i> , Springer.                                                                            | <input checked="" type="checkbox"/> |
| Further        | ACM Transactions on Information Systems                                                                                                        | <input checked="" type="checkbox"/> |
| Further        | Journal of Data and Information Quality                                                                                                        | <input checked="" type="checkbox"/> |
| Further        | Journal of the ACM                                                                                                                             | <input checked="" type="checkbox"/> |
| Further        | Journal of Systems Engineering and Electronics                                                                                                 | <input checked="" type="checkbox"/> |

|                       |                      |
|-----------------------|----------------------|
| <b>Module Code</b>    | <b>ACDB4007</b>      |
| <b>Title</b>          | <b>Physics (OME)</b> |
| <b>Date</b>           | <b>17/08/2022</b>    |
| <b>Level</b>          | <b>4</b>             |
| <b>Credits</b>        | <b>20</b>            |
| <b>Pre-Requisites</b> | <b>None</b>          |

### AIM(S)

- To provide a basic understanding of the principles and applications associated with general aspects of physics.

### LEARNING OUTCOMES

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

- Demonstrate an understanding of basic mechanical and thermal aspects of physics and engineering science relevant to OME, with complementary analysis of appropriate problem examples.

### INDICATIVE CONTENT

- Mechanics
  - Static equilibrium; Free Body Diagrams, resolution of vectors;
  - Material models; Dependence of stress on strain and strain-rate.
  - Dynamics of translational and rotational motion: Newton's Laws, Moment of Inertia
  - Simple Harmonic Motion
- Thermal Physics
  - concept of temperature equilibrium
  - Specific Heat, Fourier's Law
  - Thermal diffusion, convection and radiation
- Introduction to equations of state for fluids
- Computational modelling of ballistic impact

### Study Time Allocation

The study time for the module is divided as follows:

| <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

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Written Exam       | 2 hours | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume      | Weighting |
|--------------------|-------------|-----------|
| Written Lab Report | 1,500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDB4007                                                                                                                       |                                     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Physics (OME)                                                                                                                  |                                     |
| Classification | Reading List entry                                                                                                             | Electronic*                         |
| Essential      | Beer, F., Johnson, E. et al, (2015) <i>Mechanics of Materials</i> , New York : McGraw-Hill                                     | <input checked="" type="checkbox"/> |
| Further        | Benham, P.P., Crawford, R.J. and Armstrong, C.G. (2006) <i>Mechanics of Engineering Materials</i> , New Jersey : Prentice Hall | <input type="checkbox"/>            |
| Further        | Bolton, W. (2006) <i>Mechanical Science - 3<sup>rd</sup> ed</i> , New Jersey : Wiley-Blackwell                                 |                                     |
| Further        | Bacon, D.H. (1998) <i>Mechanical Technology</i> , Oxford : Butterworth-Heinemann                                               | <input checked="" type="checkbox"/> |
| Further        | <b>Online resources:</b><br>Abaqus Online material<br>IEEE Xplore,<br>Science Direct                                           | <input checked="" type="checkbox"/> |

|                       |                     |
|-----------------------|---------------------|
| <b>Module Code</b>    | <b>ACDB4010</b>     |
| <b>Title</b>          | <b>Study Skills</b> |
| <b>Date</b>           | <b>17/08/2022</b>   |
| <b>Level</b>          | <b>4</b>            |
| <b>Credits</b>        | <b>10</b>           |
| <b>Pre-Requisites</b> | <b>None</b>         |

### AIM(S)

- To provide students with the essential knowledge and techniques that underpin and enhance the learning process. Students will be encouraged to develop a positive and reflective approach to learning, and to take responsibility for their own learning. Such skills promote a deeper understanding of the topics studied throughout the Higher Education programme; they support sustainable lifelong learning, and are the transferable skills desired in the employment context.

### LEARNING OUTCOMES

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

- Demonstrate transferable skills in a learning environment.
- Apply an academic, positive and professional approach to their studies

### INDICATIVE CONTENT

- Understanding the learning process e.g. definitions, the learning process, learning styles, self-belief, confidence and positive engagement, reflection, life-long learning.
- Gathering relevant information e.g. note taking, using the library and online resources.
- Communicating and presenting information e.g. presentation techniques and styles.
- Academic and Professional writing e.g. planning and structuring reports, linking ideas, using facts, opinions, analytical thinking.
- Standard referencing systems e.g. Harvard and Numeric system.
- Revision and examination techniques e.g. preparation, organisation, memory aids.
- Identifying skills e.g. self-evaluation, skills needed for higher education, transferable skills, action plans for personal development.
- Employability skills and competencies, professional presentation and self-promotion, e-Portfolio, choosing the right jobs and employers.
- Successful Self-management e.g. time management, organising space and resources, positive attitude, emotional intelligence, managing change, stress management.
- Successful Problem-solving e.g. action-plans, solution-focused thinking, thinking outside the box, creative problem-solving techniques.

- People skills: evaluating people skills, intelligence types, collaboration and team-working, leadership.
- Professional, legal, ethical and sustainability issues related to Higher Education, Employment, and Professional Practice.
- Introduction to statistics

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam                      ☒ Coursework                      ☐ Practical

| Mode of assessment | Volume                    | Weighting |
|--------------------|---------------------------|-----------|
| Portfolio          | Equivalent to 2,000 words | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDB4010                                                                                                                                                             |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Study Skills                                                                                                                                                         |                                     |
| Classification | Reading List entry                                                                                                                                                   | Electronic*                         |
| Essential      | Cottrell, S. (2015) <i>Skills for Success: Personal Development and Employability - 2<sup>nd</sup> ed</i> , London : Palgrave Macmillan                              | <input checked="" type="checkbox"/> |
| Essential      | Cottrell, S. (2013) <i>The Study Skills Handbook – 4<sup>th</sup> ed</i> , London : Palgrave Macmillan                                                               | <input type="checkbox"/>            |
| Further        | Smale, B. and Fowlie, J. (2015) <i>How to Succeed at University: an Essential Guide to Academic Skills and Personal Development</i> , London : Sage Publications Ltd | <input checked="" type="checkbox"/> |
| Further        | Cottrell, S. (2017) <i>Critical Thinking Skills: Developing Effective Analysis and Argument – 2<sup>nd</sup> ed</i> , London : Palgrave Macmillan                    | <input type="checkbox"/>            |

|         |                                                                                                                                             |                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Duquenoy, P. (2007) <i>Ethical, Legal and Professional Issues in Computing - 1<sup>st</sup> ed</i> , Boston, Mass : Thomson Learning        | <input type="checkbox"/>            |
| Further | Emden, J. and Becker, L. (2016) <i>Presentation Skills for Students – 2<sup>nd</sup> ed</i> , London : Palgrave Macmillan                   | <input type="checkbox"/>            |
| Further | Pears, R. and Shields, G. (2016) <i>Cite Them Right: The Essential Referencing Guide – 8<sup>th</sup> ed</i> , London : Palgrave Macmillan. | <input type="checkbox"/>            |
| Further | Pedler, M., Burgoyne, J. and Boydell, T. (2013) <i>A Manager's Guide to Self Development</i> , New York : McGraw Hill                       | <input checked="" type="checkbox"/> |
| Further | International Journal for Academic Development                                                                                              | <input type="checkbox"/>            |
| Further | Journal of the International Consortium for Educational Development                                                                         | <input type="checkbox"/>            |
| Further | International Journal of Training and Development                                                                                           | <input type="checkbox"/>            |
| Further | <a href="http://www.skills4study.com">http://www.skills4study.com</a>                                                                       | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.palgrave.com/skills4study">http://www.palgrave.com/skills4study</a>                                                     | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.cipd.co.uk">http://www.cipd.co.uk</a>                                                                                   | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.ltscotland.org.uk/studyskills">http://www.ltscotland.org.uk/studyskills</a>                                             | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.bized.co.uk/reference/studyskills/index.htm">http://www.bized.co.uk/reference/studyskills/index.htm</a>                 | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.how-to-study.com">http://www.how-to-study.com</a>                                                                       | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.employment-studies.co.uk">http://www.employment-studies.co.uk</a>                                                       | <input checked="" type="checkbox"/> |

|                       |                        |
|-----------------------|------------------------|
| <b>Module Code</b>    | <b>ACDB4011</b>        |
| <b>Title</b>          | <b>Chemistry (OME)</b> |
| <b>Date</b>           | <b>17/08/2022</b>      |
| <b>Level</b>          | <b>4</b>               |
| <b>Credits</b>        | <b>20</b>              |
| <b>Pre-Requisites</b> | <b>None</b>            |

### AIM(S)

- To develop in the student an understanding of the basic chemistry and chemical mechanisms involved in the broad range of energetic and related materials used in OME.

### LEARNING OUTCOMES

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

- Evaluate and communicate an understanding of reaction chemistry, the concepts of fuels and oxidisers, oxygen balance, energy, heat flow and energy release
- Utilise data and information to formulate a plan that delivers the desired effect from an OME device

### INDICATIVE CONTENT

- Atomic and molecular structures
  - Solid, liquid and gaseous states
  - Phase transformations
  - Bonding
- Chemical reactions.
- Fuels, oxidising agents and related materials used in OME
- Physical and chemical mechanisms and kinetics involved in OME
- Introduction to Materials Science
- Introduction to materials selection for OME devices
- OME effects
  - Flame, heat, light, sound and pressure effects

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                         | Volume                 | Weighting |
|------------------------------------------------------------|------------------------|-----------|
| Portfolio (combination of quizzes, practical work, report) | 2,000 words equivalent | 50%       |

### Assessment Component 2

(Tick one)

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume  | Weighting |
|--------------------|---------|-----------|
| Written Exam       | 2 hours | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACDB4011                                                                                                              |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Chemistry (OME)                                                                                                       |                                     |
| Classification | Reading List entry                                                                                                    | Electronic*                         |
| Essential      | Akhavan, J. (2022) <i>The Chemistry of Explosives: Edition 4</i> Cambridge : Royal Society of Chemistry               | <input checked="" type="checkbox"/> |
| Essential      | JSP 333: <i>Services textbook of explosives</i> , Ministry of Defence, 2020                                           | <input type="checkbox"/>            |
| Further        | Atkins, P. (2013) <i>Reactions – The Private Life of Atoms</i> , Cambridge : Royal Society of Chemistry               | <input checked="" type="checkbox"/> |
| Further        | Hall, C. (2014) <i>Materials – A Very Short Introduction</i> , Cambridge : Royal Society of Chemistry                 | <input type="checkbox"/>            |
| Further        | Wayne, R.P. (1994) <i>Chemical Instrumentation - Oxford Chemistry Primers</i> , Oxford : OUP                          | <input type="checkbox"/>            |
| Further        | Metcalfe, I.S. (1997) <i>Chemical Reaction Engineering – a First Course - Oxford Chemistry Primers</i> , Oxford : OUP | <input type="checkbox"/>            |

|         |                                                                                                                                                       |                          |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Lawrence, N., Wadhawan, J. and Compton, R. (1999) <i>Foundations of Physical Chemistry: Worked Examples - Oxford Chemistry Primers</i> , Oxford : OUP | <input type="checkbox"/> |
| Further | Ritchie, G. and Sivia, D.S. (2000) <i>Foundations of Physics for Chemists - Oxford Chemistry Primers</i> , Oxford : OUP                               | <input type="checkbox"/> |
| Further | Sivia, D.S. and Rawlings, S.G. (1999) <i>Foundations of Science Mathematics - Oxford Chemistry Primers</i> , Oxford : OUP                             | <input type="checkbox"/> |
| Further | Winterton, R.H.S. (1997) <i>Heat Transfer - Oxford Chemistry Primers</i> , Oxford : OUP                                                               | <input type="checkbox"/> |
| Further | Brouard, M. (1998) <i>Reaction Dynamics - Oxford Chemistry Primers</i> , Oxford : OUP                                                                 | <input type="checkbox"/> |

|                       |                        |
|-----------------------|------------------------|
| <b>Module Code</b>    | <b>ACHA4005</b>        |
| <b>Title</b>          | <b>Academic Skills</b> |
| <b>Date</b>           | <b>14/05/2020</b>      |
| <b>Level</b>          | <b>4</b>               |
| <b>Credits</b>        | <b>20</b>              |
| <b>Pre-Requisites</b> | <b>None</b>            |

### **AIM(S)**

- To enable students to communicate effectively in a written form when describing concepts or constructing arguments
- To enable students to use a range of suitable academic to help them present information and data.

### **LEARNING OUTCOMES**

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

- Write clearly and effectively when describing ideas and concepts relevant to their field and consulting and reference appropriate resources to support their analysis or findings.
- Use a range of suitable academic tools (theoretical, computational or practical) to help solve problems and communicate the results in a professional manner.

### **INDICATIVE CONTENT**

- The learning process and the skills required to develop an understanding of a concept or principle.
- Gathering information, planning and researching a topic
- Strategies for taking notes, writing essays and reports
- Understanding the elements of non-verbal communication, constructing and documenting arguments
- Developing confidence in tackling communication tasks and being able to debate effectively
- The importance of referencing and the standard referencing systems
- Apply professional skills learned to area of study
- Developing knowledge of suitable computational software that can help with academic work, such as Microsoft Word and Microsoft Excel
- Gaining relevant additional skills specific to programme stream.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 1500 words | 50%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 1500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACHA4005                                                                                                                                                                                                         |                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Academic Skills                                                                                                                                                                                                  |                                     |
| Classification | Reading List entry                                                                                                                                                                                               | Electronic*                         |
| Essential      | Osmond, A (2015) Academic Writing and Grammar for Students 2 <sup>nd</sup> Edition, Palgrave Macmillan                                                                                                           | <input type="checkbox"/>            |
| Essential      | Pears, R, Sheilds, G (2019) Cite Them Right: The Essential Referencing Guide, Palgrave Macmillan                                                                                                                 | <input checked="" type="checkbox"/> |
| Essential      | UWTSD Library Referencing Handbooks, available at: <a href="https://www.uwt.ac.uk/library/student-essentials/referencing-handbooks/">https://www.uwt.ac.uk/library/student-essentials/referencing-handbooks/</a> | <input checked="" type="checkbox"/> |
| Further        | Cottrell, S (2019) The Study Skills Handbook, SAGE Publications Ltd                                                                                                                                              | <input checked="" type="checkbox"/> |
| Further        | Gillett, A (2009) Inside Track to Successful Academic Writing, Longman                                                                                                                                           | <input type="checkbox"/>            |
| Further        | Greetham, B (2013) How to Write Better Essays, Palgrave Macmillan                                                                                                                                                | <input type="checkbox"/>            |

|  |                                                                                                             |                          |
|--|-------------------------------------------------------------------------------------------------------------|--------------------------|
|  | Cottrell, S (2011) Critical Thinking Skills: Developing Effective Analysis and Argument, Palgrave Macmillan | <input type="checkbox"/> |
|--|-------------------------------------------------------------------------------------------------------------|--------------------------|

|                       |                            |
|-----------------------|----------------------------|
| <b>Module Code</b>    | <b>ACHA4008</b>            |
| <b>Title</b>          | <b>Integrating Project</b> |
| <b>Date</b>           | <b>14/05/2020</b>          |
| <b>Level</b>          | <b>4</b>                   |
| <b>Credits</b>        | <b>20</b>                  |
| <b>Pre-Requisites</b> | <b>None</b>                |

### AIM(S)

- To enable students to apply the knowledge they have gained through the modules they have studied, in the development of project. The product of the project will take the form of a subject related application which may be a software application, electronics application, design, etc.

### LEARNING OUTCOMES

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

- To implement an application/design synthesizing their knowledge from a number of modules
- To analyse a well-defined scenario, establish the requirements and develop an appropriate solution

### INDICATIVE CONTENT

- Overview of research and development methodologies suitable for student projects.
- Ethical issues
- Sustainability issues
- Contingency planning
- Development of documentation for academic projects
- Presentation of work produced to an academic audience
- Subject-specific content as required

### Study Time Allocation

The study time for the module is divided as follows:

| <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

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written assessment | 2000 words | 60%       |

### Assessment Component 2

(Tick one)

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment            | Volume            | Weighting |
|-------------------------------|-------------------|-----------|
| Presentation or Demonstration | Approx 10 minutes | 40%       |

### Assessment Summary

| Activity type | Percentage  |
|---------------|-------------|
| Written exam  | 0%          |
| Coursework    | 60%         |
| Practical     | 40%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

| Module Code    | ACHA4008                                                                                                                          |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Integrating Project                                                                                                               |                                     |
| Classification | Reading List entry                                                                                                                | Electronic*                         |
| Essential      | Larson, E.W. (2017) 7th Edition, Project Management. McGraw-Hill                                                                  | <input checked="" type="checkbox"/> |
| Further        | Newton, R. (2016), Project Management Step by Step, FT Publishing International                                                   | <input checked="" type="checkbox"/> |
| Further        | Hughes, B. (2015), 5th Edition Project Management for IT-Related Projects, British Computer Society                               | <input checked="" type="checkbox"/> |
| Further        | Christopher, D (2013) Computing Projects, Pearson Education                                                                       | <input type="checkbox"/>            |
| Further        | Berndtsson, T (2012) Planning and Implementing your Project, Springer Verlag                                                      | <input type="checkbox"/>            |
| Further        | Cottrell, S.(2011) Critical Thinking Skills: Developing Effective Analysis and Argument, Palgrave Macmillan                       | <input type="checkbox"/>            |
| Further        | Collis, J., Hussey, R (2009) Business Research: a Practical Guide for Undergraduate and Postgraduate Students, Palgrave Macmillan | <input type="checkbox"/>            |

|                    |                              |
|--------------------|------------------------------|
| <b>Cod y Modwl</b> | <b>ACHA4008C</b>             |
| <b>Teitl</b>       | <b>Prosiect Integreiddio</b> |
| <b>Dyddiad</b>     | <b>14/05/2020</b>            |
| <b>Lefel</b>       | <b>4</b>                     |
| <b>Credydau</b>    | <b>20</b>                    |
| <b>Rhagofynion</b> | <b>Dim</b>                   |

## AMCAN(ION)

- Galluogi myfyrwyr i gymhwyso'r wybodaeth maent wedi'i hennill drwy'r modylau maent wedi'u hastudio, wrth ddatblygu'r prosiect. Bydd cynnyrch y prosiect ar ffurf cymhwysiad sy'n berthnasol i'r pwnc a allai fod yn gymhwysiad meddalwedd, cymhwysiad electroneg, dylunio ac ati.

## DEILLIANNAU DYSGU

Ar ôl cwblhau'r modwl hwn yn llwyddiannus, dylai'r myfyriwr allu:

- Gweithredu cymhwysiad/dyluniad sy'n cyfuno eu gwybodaeth o nifer o fodylau
- Dadansoddi senario sydd wedi'i ddiffinio'n dda, cadarnhau'r gofynion a datblygu datrysiaid priodol

## CYNNWYS DANGOSOL

- Trosolwg o fethodolegau ymchwil a datblygu sy'n addas ar gyfer prosiectau myfyrwyr.
- Materion moesegol
- Materion cynaliadwyedd
- Cynllunio wrth gefn
- Datblygu dogfennau ar gyfer prosiectau academiaidd
- Cyflwyno gwaith a gynhyrchwyd i gynulleidfa academiaidd
- Cynnwys pwnc-benodol yn ôl yr angen

## Dyraniad Amser Astudio

Mae'r amser astudio ar gyfer y modwl wedi ei rannu fel a ganlyn:

| <b>Math o weithgaredd</b> | <b>Oriau</b> | <b>Canran</b> |
|---------------------------|--------------|---------------|
| Dysgu ar yr amserlen      | 48           | 24%           |
| Dysgu'n annibynnol        | 152          | 76%           |
| Dysgu drwy leoliadau      | 0            | 0%            |
| <b>CYFANSWM</b>           | <b>200</b>   | <b>100%</b>   |

## ASESU

### Elfen Asesu 1

(Ticiwch un)

☐ Arholiad ysgrifenedig ☒ Gwaith cwrs ☐ Ymarferol

| Dull asesu           | Maint         | Pwysoliad |
|----------------------|---------------|-----------|
| Asesiad ysgrifenedig | 2000 o eiriau | 60%       |

### Elfen Asesu 2

(Ticiwch un)

☐ Arholiad ysgrifenedig ☐ Gwaith cwrs ☒ Ymarferol

| Dull asesu                  | Maint            | Pwysoliad |
|-----------------------------|------------------|-----------|
| Cyflwyniad neu Arddangosiad | Oddeutu 10 munud | 40%       |

### Crynodeb o'r Asesiad

| Math o weithgaredd    | Canran      |
|-----------------------|-------------|
| Arholiad ysgrifenedig | 0%          |
| Gwaith cwrs           | 60%         |
| Ymarferol             | 40%         |
| <b>CYFANSWM</b>       | <b>100%</b> |

## RHESTR DDARLLEN DDANGOSOL

| Cod y Modwl   | ACHA4008C                                                                                                                         |                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Teitl y Modwl | Prosiect Integreiddio                                                                                                             |                                     |
| Categori      | Eitemau'r Rhestr Ddarllen                                                                                                         | Electronig *                        |
| Hanfodol      | Larson, E.W. (2017) 7th Edition, Project Management. McGraw-Hill                                                                  | <input checked="" type="checkbox"/> |
| Pellach       | Newton, R. (2016), Project Management Step by Step, FT Publishing International                                                   | <input checked="" type="checkbox"/> |
| Pellach       | Hughes, B. (2015), 5th Edition Project Management for IT-Related Projects, British Computer Society                               | <input checked="" type="checkbox"/> |
| Pellach       | Christopher, D (2013) Computing Projects, Pearson Education                                                                       | <input type="checkbox"/>            |
| Pellach       | Berndtsson, T (2012) Planning and Implementing your Project, Sringer Verlang                                                      | <input type="checkbox"/>            |
| Pellach       | Cottrell, S.(2011) Critical Thinking Skills: Developing Effective Analysis and Argument, Palgrave Macmillan                       | <input type="checkbox"/>            |
| Pellach       | Collis, J., Hussey, R (2009) Business Research: a Practical Guide for Undergraduate and Postgraduate Students, Palgrave Macmillan | <input type="checkbox"/>            |

|                       |                          |
|-----------------------|--------------------------|
| <b>Module Code</b>    | <b>ACMA4009</b>          |
| <b>Title</b>          | <b>Applied Analytics</b> |
| <b>Date</b>           | <b>24/02/2021</b>        |
| <b>Level</b>          | <b>4</b>                 |
| <b>Credits</b>        | <b>10</b>                |
| <b>Pre-Requisites</b> | <b>None</b>              |

### AIM(S)

- To provide students with a sound understanding of mathematical, scientific and technological principles.

### LEARNING OUTCOMES

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

- Apply a range of analytical principles and understand how they can be used to solve technical problems.

### INDICATIVE CONTENT

- Solution of linear and quadratic equations
- Solution of simultaneous equations
- Transposition of formula
- Introduction to trigonometry and right-angled triangles (SOHCAHTOA)
- Units - basic SI units of length, mass and time, area and volume, density and relative density, mass and weight, force, work and power.
- Newton's laws of motion
- Equations of linear motion
- Forces and moments - conditions of static equilibrium, forces and reaction, especially simply supported beams. Moments of a form. Resultant, couples, center of gravity. Vector rotation. Resolution of forces. Polygon of forces.
- Introduction to Stress and Strain, Young's modulus
- Electrical current/voltage. Mechanical analogies. Resistors in series and parallel. The heating effect of current, variation of resistance with temperature incandescent lamp.
- Voltage divider and current divider. Simple circuit calculations, use of Ohm's law and Kirchhoff's laws

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☐ Coursework      ☒ Practical

| Mode of assessment                 | Volume | Weighting |
|------------------------------------|--------|-----------|
| In class exercise / practical test | 1 hour | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACMA4009                                                                     |                                     |
|----------------|------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Applied Analytics                                                            |                                     |
| Classification | Reading List entry                                                           | Electronic*                         |
| Essential      | Smedley, R., Wiseman, G., Introducing Pure Mathematics (Oxford, 2001)        | <input type="checkbox"/>            |
| Essential      | Bolton, W. (2007) Engineering Science, Arnold                                | <input type="checkbox"/>            |
| Essential      | Davies, H; Hicks, A, Mathematics for Scientific and Technical Students       | <input checked="" type="checkbox"/> |
| Further        | Stroud, K A, (2007) Engineering Mathematics, Industrial Press                | <input type="checkbox"/>            |
| Further        | McDonagh, I. and Waterworth, G. Engineering Science Volumes 1 and 2, Arnold  | <input type="checkbox"/>            |
| Further        | Bird, J. O. and Ross, C. (2012) Mechanical Engineering Principles, Routledge | <input type="checkbox"/>            |
| Further        | Bird, J, (2006) Higher Engineering Mathematics, Newnes                       | <input type="checkbox"/>            |
| Further        | McDonagh, I., Mechanical Science for Technicians Volume 1, Arnold            | <input type="checkbox"/>            |
| Further        | Hannah, J. and Hillier, M.(1999) Mechanical Engineering Science, Longman     | <input type="checkbox"/>            |
| Further        | Bird, J. O. and Ross, C.(2012) Mechanical Engineering Principles, Routledge  | <input type="checkbox"/>            |



|                       |                                   |
|-----------------------|-----------------------------------|
| <b>Module Code</b>    | <b>ACMA4027</b>                   |
| <b>Title</b>          | <b>Problem Solving Techniques</b> |
| <b>Date</b>           | <b>04/08/2023</b>                 |
| <b>Level</b>          | <b>4</b>                          |
| <b>Credits</b>        | <b>20</b>                         |
| <b>Pre-Requisites</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:

- evaluate a problem and formulate requirements and constraints;
- 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.

## Study Time Allocation

The study time for the module is divided as follows:

| Activity type        | Hours      | Percentage  |
|----------------------|------------|-------------|
| 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 exam      ☐ Coursework      ☒ Practical

| Mode of assessment                                                                    | Volume | Weighting |
|---------------------------------------------------------------------------------------|--------|-----------|
| Practical – for example, a Moodle-based quiz or a task such as flowcharting a problem | 1 hour | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written assessment | 2000 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACMA4027                                                                                                                                                                                     |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Problem Solving Techniques                                                                                                                                                                   |                                     |
| Classification | Reading List entry                                                                                                                                                                           | Electronic*                         |
| 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                                    | <input checked="" type="checkbox"/> |
| Essential      | Levitin, A and Levitin, M (2011) Algorithmic Puzzles, Oxford University Press.                                                                                                               | <input checked="" type="checkbox"/> |
| Essential      | Borman, D. (2018). Statistics 101: From data analysis and predictive modeling to measuring distribution and determining probability, your essential guide to statistics. Simon and Schuster. | <input checked="" type="checkbox"/> |

|           |                                                                                                                                                                                   |   |
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