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

MODULE DIRECTORY

LEVEL 4

ACADEMIC DISCIPLINE OF APPLIED COMPUTING

WALES INSTITUTE OF SCIENCE AND ART

2023-2024

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INTRODUCTION

This Module Directory includes all the modules for Level 4 within the discipline of Applied Computing in the academic year 2023-2024.

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

Module Code	**ACCA4016**
Title	**Academic and Employability Skills**
Date	**16/08/2018**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

AIM(S)

- To provide students with the essential knowledge and techniques that explain, underpin and enhance the requisite skills needed for success in an academic environment, while supporting transferable, sustainable, lifelong learning.
- To provide students with practical and logical problem-solving skills essential in typical laboratory or workshop environments.

LEARNING OUTCOMES

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

- Demonstrate an understanding and application of transferable skills in a learning environment;
- Demonstrate an understanding of logical thinking and problem solving in a contextualised environment.

INDICATIVE CONTENT

- Understanding the learning process, reflection, life-long learning.
- Gathering relevant information e.g. note taking, using the library and online resources.
- Creating a sustainable document repository.
- Communicating and presenting information e.g. presentation techniques and
- styles.
- Academic and Professional writing e.g. planning and structuring reports
- Standard referencing systems e.g. IEEE/Numeric system.
- Identifying goals and creating action plans
- Employability skills and competencies, professional presentation and selfpromotion, 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.
- Self-evaluation skills
- Professional, legal, ethical and sustainability issues related to Higher Education,
- Employment, and Professional Practice.
- Understanding Plagiarism and Unfair Practice issues
- Health and Safety issues in context specific laboratory situations
- Understanding basic software constructs and logical thinking.
- Context specific practical skills, e.g. problem solving using programming
- techniques for Software Streams; Ability to Solder and use laboratory data acquisition equipment for Electronic streams.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	60	30%
Independent learning	140	70%
Placement learning	0	0%
TOTAL	**200**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Report	2500 words	50%

Produce a written report, reflecting and evidencing the academic and professional skills learned during the course of the module.

Assessment Component 2

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

Mode of assessment	Volume	Weighting
In-Class practical	2 hrs	**50%**

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	50%
Practical	50%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACCA4016**	
Module Title	**Academic and Employability Skills**	
Classification	**Reading List entry**	**Electronic**
Essential	Cottrell, S. (2050), *Skills for Success: Personal Development and Employability*	☒
Essential	Cottrell, S., (2013) 4th edition, *The Study Skills Handbook,* Palgrave Macmillan	☐

Essential	Sebesta, R. (2012) *Concepts of Programming Languages,* Pearson Education	☐

Essential	Smale, B. and Fowlie, J. (2015) *How to Succeed at University: An Essential Guide to Academic Skills and Personal Development,* Sage Publications Ltd.	☒
Further	Farrell, I. (2010) A Beginner's Guide to Programming Logic and Design, Course Technology	☐
Further	Cottrell, S., (2011) 2nd edition *Critical Thinking Skills: Developing Effective Analysis and Argument,* Palgrave Macmillan	☐
Further	Duquenoy, P. (2007) 1st edition, *Ethical, Legal and Professional Issues in Computing*, Thomson Learning.	☐
Further	Emden, J. and Becker, L. (2010) 2nd edition, *Presentation Skills for Students*, Palgrave Macmillan.	☐
Further	*Cite Them Right: The Essential Referencing Guide,* Palgrave Macmillan	☐
Further	Pedler , M., Burgoyne, J., Boydell, T. (2006) 5th edition, *A Manager's Guide to Self-Development.*	☐
Further	International Journal for Academic Development.	☐
Further	Journal of the International Consortium for Educational Development.	☐
Further	http://www.skills4study.com	☒
Further	http://www.palgrave.come/skills4study	☒
Further	http://www.how-to-study.com	☒
Further	https://www.codeacademy.com/	☒

Module Code	**ACCA4019**
Title	**Analysing and Solving Problems**
Date	**14/05/2020**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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	☒
Essential	Levitin, A and Levitin, M (2011) Algorithmic Puzzles, Oxford University Press.	☐
Further	Michalewicz, M and Michalewicz Z (2010), Puzzle-based Learning; An introduction to critical thinking, mathematics and problem solving, Hybrid Publishers.	☐

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

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

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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 5th Edition	☒
Essential	Novikov, D (2019) *Python for Beginners: The Ultimate Beginners Guide to Python Programming With Step by Step Guidance and Hands-On Examples.*	☒
Further	Romano, F. (2018) *Learn Python Programming: The no-nonsense, beginner's guide to programming, data science, and web development with Python 3.7, 2nd Edition,* Packt Publishing	☒
Further	McGrath, M (2018) *Python in Easy Steps, 2nd Edition*, In Easy Steps Limited	☒

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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	☒
Essential	Stallings, W (2012) Computer Organization and Architecture: Designing for Performance, Pearson Education	☐
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	☒
Further	Tanenbaum, A S, Bot, H, (2014) Modern Operating Systems, 4th Edition, Prentice Hall	☐
Further	Tanenbaum, A (2013) Computer Networks, Prentice Hall	☐

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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	☐
Essential	I Englander, The architecture of Computer Hardware, Systems Software & Networking – An Information Technology Approach, John Wiley & sons, 2014	☐
Essential	E Siever, Linux in a nutshell, O'Reilly 2009	☒
Further	https://www.tomshardware.com/uk	☒
Further	https://www.anandtech.com/	☒
Further	J O'Gorman, Operating systems with Linux, Palagrave 2001	☐
Further	S Mueller, Upgrading and repairing PCs, Que 2015	☐

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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, *Database Systems: A Practical Approach to Design, Implementation and Management*, 6th Edition, Addison Wesley	☒
Essential	Viescas, J. L., 2018, SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL, 4th Edition, Addison-Wesley Professional	☒
Essential	Robbins, J., 2018, Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, O'Reilly Media	☒
Further	Duckett, J., 2014, *Web Design with HTML, CSS, JavaScript and jQuery Set*, Wiley	☒
Further	Coronel, C. & Morris, S., 2018, Database Systems: Design, Implementation, & Management, 13th Edition, Cengage Learning	☒

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

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%
TOTAL	**200**	**100%**

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 hrs	50%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	**100%**

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	☒
Essential	www.netacad.com Username and password required	☒
Essential	William Stallings (2017) Network Security Essentials: Applications and Standards, 6th Edition, Pearson	☒
Further	J. S. Beasley & P. Nilkaew (2018) Networking Essentials: A CompTIA Network+ N10-007 Textbook, 5th Edition, Pearson IT Certification	☒
Further	IEEE/ACM, IEEE/ACM Transactions on Networking	☒
Further	IEEE, IEEE Network Magazine	☒
Further	Science Direct	☒
Further	Scopus	☒

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	ACCA4025	
Module Title	Learning in the Digital Era	
Classification	**Reading List entry**	**Electronic***
Essential	Cottrell, S (2019) *The Study Skills Handbook.* 5th edn. London: Macmillan International Higher Education.	☒
Essential	Pears, R. and Shields, G.J. (2019) *Cite Them Right: the essential referencing guide.* 11th edn. London: Macmillan International Higher Education.	☒
Essential	Library Info Skills Sessions	☒

Further	Hopkins, D. and Reid, T., 2018. *The Academic Skills Handbook: Your Guide to Success in Writing, Thinking and Communicating at University*. London: Sage	☐
Further	Osmond, A., 2016. *Academic Writing and Grammar for Students* 2nd edn. London: SAGE.	☐

Module Code	ACCA4027
Title	Contemporary Challenges: Making a Difference
Date	25/06/2020
Level	4
Credits	20
Pre-Requisites	None

AIM(S)

- To develop student's awareness and appreciation of contemporary challenges relevant to the discipline facing individuals, organisations, communities and society, from a local, national and global perspective.
- To develop creative problem-solvers through the application of knowledge to real-world problems.

LEARNING OUTCOMES

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

- Identify and evaluate historical and contemporary issues and their impact on today's global society.
- Apply appropriate collaborative working practices to manage conflict and support effective decision making.
- Implement Design Thinking techniques to investigate problems in order to generate and evaluate solutions.

INDICATIVE CONTENT

- Visions of the Future including digital transformation 4.0.
- How history, legislation and policy shape the world we live.
- Contemporary global issues, e.g. responsible stewardship, diversity, inclusion, ethics, culture and intercultural awareness.
- 'Wicked problems': the challenge of difficult or impossible problems where the affecting variables are not known or quantifiable.
- Design Thinking to investigate, define, propose and evaluate problem solutions.
- Recognising and overcoming cognitive bias.
- Decision making frameworks and techniques.
- Recognising individual differences and the role of emotional intelligence in the management of conflict.
- The role of diplomacy, persuasion and negotiation in effective collaboration.
- The significance of interdisciplinary thinking in finding effective solutions to problems.

- The role of ethics in identifying solutions.
- Collective decision-making.
- The power of raising awareness

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%
TOTAL	**200**	**100%**

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
Group Presentation with supporting material	Each individual in the group to contribute 2 minutes to the presentation and each individual to contribute 1,000 words to the supporting materials (max 6 in a group)	50%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	50%
Practical	50%
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	**ACCA4027**	
Module Title	**Contemporary Challenges: Making a Difference**	
Classification	**Reading List entry**	**Electronic***
Essential	Siebel, T. M. (2019) *Digital Transformation: Survive and Thrive in an Era Of Mass Extinction*. New York: Rosetta Books.	☒
Essential	Stickdorn, M. and Schneider, J. (2011) *This is Service Design Thinking: Basics, Tools, Cases.* The Netherlands: BIS Publishers	☐
Essential	Echavarria, M. (2015). *Enabling Collaboration*. New York: LID Editorial.	☐
Essential	Well-being of Future Generations (Wales) Act 2015 (Online). Available at http://www.legislation.gov.uk/anaw/2015/2/contents/enacted	☒
Further	Fisher, R., Ury, W.L. and Patton, B. (2011) *Getting to Yes: Negotiating Agreement Without Giving In.* 3rd ed. New York: Penguin.	☐
Further	Harari, Y. N. (2018) *21 Lessons for the 21st Century.* London: Jonathan Cape	☐

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

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:

Activity type	Hours	Percentage
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	0%
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Portfolio 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: • Written Report • Hardware implementation Demonstration of work	2,000 words equivalent	100%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	**100%**

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, 10th Ed. Pearson Education	☒
Essential	www.netacad.net username and password required	☒
Further	Bott, E & Stinson, T (2019) Windows 10 Inside Out, 3rd Ed, Microsoft Press	☒
Further	Tanenbaum, A S, Bot, H, (2014) Modern Operating Systems, 4th Edition, Prentice Hall,	☐

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

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:

Activity type	Hours	Percentage
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	0%
TOTAL	**100**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACCA4029**	
Module Title	**Cyber Security Essentials**	
Classification	**Reading List entry**	**Electronic***
Essential	www.netacad.net username and password required	☒
Further	William Stallings (2017) Network Security Essentials: Applications and Standards, 6th Edition, Pearson	☒
Further	C J Brooks, C Grow, P Craig and D Short (2018) Cybersecurity Essentials, John Wiley & Sons, Inc	☒

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

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:

Activity type	Hours	Percentage
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	0%
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Portfolio 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: • Written Report • Presentation slides • Software/hardware implementation Demonstration of work	2,000 words equivalent	100%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	**100%**

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	☒
Essential	P. Carey, K. T. Pinard, A. Shaffer, M. Shellman, S. Vodnik (2020) New Perspectives Microsoft Office 365 & Office 2019 Introductory, 1st Edition	☒
Further	S Baase & T. M. Henry (2018) Gift of Fire, A: Social, Legal, and Ethical Issues for Computing Technology, 5th Edition, Pearson	☒

Module Code	**ACCA4032**
Title	**Environment Design**
Date	**08/12/2021**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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 utilizing and applying composition, colour and lighting techniques

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%
TOTAL	**200**	**100%**

ASSESSMENT

Assessment Component 1

☐ **Written Exam** ☐ **Coursework** ☒ **Practical**

Mode of assessment	Volume	Practical
Live Group Presentation	10 min per person	100%

Assessment Summary

Activity type	Percentage
Written Exam	
Coursework	
Practical	100%
TOTAL	**100%**

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.	
	Cabera, C. and Urschel, J. (2014) *Digital Painting Techniques: Volume 6*. 3DTotal Publishing.	
	Georgina, S. (2012) *Designing for Screen: Production Design And Art Direction Explained*. Marlborough: The Crowood Press Ltd	
	Rogers, S. (2014) *Level Up! The Guide to Great Video Game Design*. London: Wiley	
	Reed, A. (2019) *Adventure Games: Playing The Outsider*. London: Bloomsbury Academic.	
	Perron, B. (2018) *The World of Scary Video Games.* London: Bloomsbury Academic.	
	Voorhees, G., Call, J. and Whitlock, K. (2012) Guns, *Grenades and Grunts: First-Person Shooter Games.* London: Bloomsbury Academic.	
	Voorhees, G., Call, J. and Whitlock, K. (2012) *Dungeons, Dragons and Digital Denizens: The Digital Role-Playing Game*. London: Bloomsbury Academic.	
	Bim, J. (2013) *Digital Lighting And Rendering*. London: New Riders.	
	Kremers, R. (2009) *Level Design: Concept, Theory, and Practice.* London: A K Peters/CRC Press.	
	Winslow, C. (2006) *The Handbook Of Set Design.* Marlborough: The Crowood Press Ltd.	
	http://gamasutra.com/	
	https://www.youtube.com/user/3DBuzz	
	http://www.develop-online.net/	

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

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:

Activity type	**Hours**	**Percentage**
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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	
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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

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%
TOTAL	**200**	**100%**

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	
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	**ACCA4035**
Title	**Visual Studies**
Date	**08/12/2021**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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

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:

Activity type	Hours	Percentage
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	0%
TOTAL	**100**	**100%**

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	
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Further	Tufte, E. (2001) *The Visual Display of Quantitative Information (2nd Ed.)* Graphics Press USA	☐
Further	Tufte, E. (1997), *Visual Explanations, Images and Quantities, Evidence and Narrative.* Graphics Press	☐
Further	Tufte, E. (1990) *Envisioning Information*, Graphics Press USA	☐

Module Code	**ACCB4017**
Title	**Software Development**
Date	**09/09/2020**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

	the PIC24 Family. 2nd ed. Boston, MA: Cengage Learning	
Further	Kaler, R. S. (2013) *Microprocessors and Microcontrollers* 2nd ed. New Delhi: IK International Publishing House	☐
Further	Siegesmund, M. (2014) *Embedded C Programming: Techniques and Applications of C and PIC MCUS* Oxford: Newnes	☐

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

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, Lens' 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	
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Further	**Journals** Elektor Electronics World IEEE Xplore ACM Digital Library	☒
Further	**Websites** Various on-line video lectures MIT Open Courseware http://vl.fmnet.info/safety/ http://mingo.info-science.uiowa.edu/soft-eng/ http://www.fmeurope.org/	☒

Module Code	**ACDA4008**
Title	**Mathematics**
Date	**15/08/2018**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
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%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACDA4008**	
Module Title	**Mathematics**	
Classification	**Reading List entry**	**Electronic***
Essential	Stroud, K. A. and Booth, D. J. (2013) *Engineering Mathematics* 7th Ed London: Palgrave	☐
Further	Bird, J. O. (2010) *Higher Engineering Mathematics* 8th Ed Oxford: Newnes	☒
Further	Singh, K. (2011) *Engineering Mathematics Through Applications,* London: Palgrave	☐
Further	**Websites** http://www.khanacademy.org	☐

Module Code	**ACDA4009**
Title	**Signals and Systems**
Date	**13/10/2021**
Level	**4**
Credits	**10**
Pre-Requisites	**None**

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:

Activity type	**Hours**	**Percentage**
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	
TOTAL	**100**	**100%**

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
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	**ACDA4012**
Title	**Introduction to Electronics**
Date	**14/05/2020**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

AIM(S)

- To provide an essential understanding of electrical and electronic concepts considered necessary as a foundation for an engineering degree courses and to show the relevance of those concepts in everyday applications

LEARNING OUTCOMES

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

- Demonstrate a sound grasp of basic electrical and electronic principles in analysing simple problems

- Explain and evaluate the operation of simple Electrical/Electronic networks

INDICATIVE CONTENT

- DC Electrical Circuit: Electrical current/voltage. Mechanical analogies. Resistors in series and parallel. 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

- Signals: DC, sinusoid, square wave. Period and frequency. Use of oscilloscope. Peak, mean and rms.

- AC circuits: Capacitors and inductors. Rate of change of current and voltage,

- C R and L R behaviour to sine and step voltages

- Diodes and Rectifiers: Simple ideas of semiconductors. Simple half wave rectifiers.

- Transistor Amplifiers/Switches: What is a transistor? Design of simple amplifiers.

- Operational Amplifiers: What is an op. Amp? Design of simple inverting and non-inverting amplifiers.

- Digital Circuits: Representation of information by logic levels. Basic gates, AND, OR, NAND, NOR, NOT, XOR. Simple combinational logic.

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%
TOTAL	**200**	**100%**

ASSESSMENT

Assessment Component 1
(Tick one)

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

Mode of assessment	Volume	Weighting
Written assessment	1500 words	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	50%
Coursework	50%
Practical	0%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACDA4012**	
Module Title	**Introduction to Electronics**	
Classification	**Reading List entry**	**Electronic***
Essential	Bird, J (2017) Electrical Circuit Theory and Technology 6th Ed, Routledge	☒
Essential	Floyd, T L (2012) DC/AC Fundamentals: A Systems Approach, Prentice Hall	☐
Further	Sinclair, I., Dutton, J (2007) Practical Electronics Handbook, Newnes	☐

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

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	ACDA4015
Title	Electronics Principles and Concepts
Date	24/02/2021
Level	4
Credits	10
Pre-Requisites	None

AIM(S)

- To provide the student with the fundamentals of electronics: definitions of voltage, current, resistance, Ohm's law, Power, circuit theorems.

LEARNING OUTCOMES

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

- Analyse simple circuits and networks using appropriate analysis tools.

INDICATIVE CONTENT

- Definitions of voltage, current, resistance, power and energy
- Ohm's Law
- Series and parallel connections of resistors
- Kirchhoff's Voltage Law and Kirchhoff's Current Law
- Potential and Current divider networks
- Circuit Theorems – Thévenin's and Norton's Theorems

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%
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Portfolio	2000 words equivalent	100%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACDA4015**	
Module Title	**Electronics Principles and Concepts**	
Classification	**Reading List entry**	**Electronic***
Essential	Bird, John (2014) - *Electrical circuit Theory and Technology, Fifth Edition,* Routledge	☒
Further	Floyd, Thomas L (2012) DC/AC Fundamentals: A Systems Approach Prentice Hall	☐
Further	Sinclair I. and J. Dutton., Practical Electronics Handbook, Newnes (2007)	☒

Module Code	**ACDA4016**
Title	**Introduction to Digital Electronics**
Date	**24/02/2021**
Level	**4**
Credits	**10**
Pre-Requisites	**None**

AIM(S)

- To provide the student with the fundamentals of electronics: Gates, registers

LEARNING OUTCOMES

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

- Analyse digital circuits and understand their operation.

INDICATIVE CONTENT

- Digital gates.
- Truth Tables
- Digital electronic concepts
- Digital circuit analysis

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%
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Exam	1 Hour	100%

Assessment Summary

Activity type	Percentage
Written exam	100
Coursework	0
Practical	0
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	ACDA4016	
Module Title	**Introduction to Digital Electronics**	
Classification	**Reading List entry**	**Electronic***
Essential	The Art of Electronics - third Edition by Paul Horowitz, Winfield Hill. - 2015	☒
Further	Introduction to Digital Electronics (Essential Electronics Series) by J. Crowe and Barrie Hayes-Gill |1998	☐
Further	Digital Electronics: A Primer - Introductory Logic Circuit Design: 1 (Primers In Electronics And Computer Science) by Nixon Mark 2015	☐

Module Code	**ACDA4017**
Title	**Introduction to Programmable Logic Controllers**
Date	**24/02/2021**
Level	**4**
Credits	**10**
Pre-Requisites	**None**

AIM(S)

- To provide the student with the fundamentals of PLC operations, Ladder Logic Programming and PLC concepts.

LEARNING OUTCOMES

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

- Read, understand and identify the control signals within a simple Ladder logic program.
- Write a simple ladder logic control program for a PLC for a given control application.

INDICATIVE CONTENT

- PLC concepts
- Inputs and outputs
- Timing Diagrams
- Ladder Logic programming
- HMIs
- Remote applications

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%
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Practical lab-based activity	2 hours	100%

Assessment Summary

Activity type	Percentage
Written exam	0
Coursework	0
Practical	100
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	ACDA4017	
Module Title	Introduction to Programmable Logic Controllers	
Classification	Reading List entry	Electronic*
Essential	Jack, H (2010), Automating Manufacturing Systems with PLCs, , Lulu.com	☒
Further	Bolton, W (2015), Programmable Logic Controllers, Newnes	☒
Further	Golnaraghi, F and Kuo, B (2017), Automatic Control Systems, Mc Graw Hill	☒

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

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
TOTAL	**100**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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
TOTAL	**100**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	**ACDA4023**
Title	**Introduction to Electronic Devices and Circuits**
Date	**04/08/2023**
Level	**4**
Credits	**10**
Pre-Requisites	**None**

AIM(S)

- To provide the student with knowledge of various types of diodes and transistors and the understanding of their application.

LEARNING OUTCOMES

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

- demonstrate the ability to describe the behaviour of electronic devices and design circuits using necessary software tools.

INDICATIVE CONTENT

- Semiconductors – Types.
- Diode – Biased and Unbiased Condition.
- LED, Zener Diode.
- Half wave and Full wave rectifier.
- Transistor - Biased and Unbiased Condition.
- BJT, FET, TRIAC DIAC, SCR, Etc.
- Applications of Transistors.
- Amplifier Circuits.

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		
TOTAL	**100**	**100%**

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Report	2000 words	100%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	100%
Practical	
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	**ACDA4023**	
Module Title	**Introduction to Electronic Devices and Circuits**	
Classification	**Reading List entry**	**Electronic***
Essential	Bird, John (2021) - *Electrical Circuit Theory and Technology, 7th Edition,* Routledge	☐
Essential	Horowitz, P. and Hill, W. (2015) *The Art of Electronics,* 3rd ed Cambridge: Cambridge University Press	☐
Further	Floyd, Thomas L (2012) *DC/AC Fundamentals: A Systems Approach* Prentice Hall	☐
Further	Scherz, P. and, Monk, S. (2016) *Practical Electronics for Inventors*, 4th edition New York: McGraw Hill	☐

Module Code	**ACDB4003**
Title	**Mathematics**
Date	**09/09/2020**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

Module Code	ACDB4003	
Module Title	Mathematics	
Classification	**Reading List entry**	**Electronic***
Essential	Stroud, K.A. and Booth, D. J. (2013) Engineering Mathematics, Palgrave	☒
Essential	Moore, H. (2018) MATLAB for Engineers: Global Edition, 5th Edition Pearson	☒
Further	Stroud, K.A. and Booth, D. J. (2009) Foundation Mathematics, Palgrave	☒
Further	Verth, J.M and Bishop, L.M. (2015) Essential Mathematics for Games and Interactive Applications, Third Edition, CRC Press	☒

Further	Palm, W.J. (2010) Introduction to MATLAB for Engineers, 3rd Edition, McGraw-Hill	☒
Essential	Lengyel, E. (2016) Foundations of Game Engine Development, Volume 1: Mathematics, Terathon Software.	☒
Further	Singh, K. (2011) Engineering Mathematics through applications, Palgrave	☐

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

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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) *Systems Engineering Principles and Practice,* New Jersey : Wiley-Blackwell	☒
Essential	Leveson, N.G and Moses, J. (2017) *Engineering a safer world: Systems thinking applied to safety (Engineering systems)*, MIT Press	☒
Further	Blanchard, B. (2009) *Systems Engineering Management - 4th ed,* New Jersey : John Wiley	☐
Further	Kasser, J. (2013) *Holistic Thinking: Creating Innovative Solutions to Complex Problems,* CreateSpace Independent Publishing Platform	☐
Further	Hitchins, D.K. (2007) *System Engineering: A 21st century systems methodology*, Wiley. ISBN: 978-0-470-05856-5	☒
Further	Checkland, P. (1999) *Systems Thinking, Systems practice: Includes a 30-year retrospective*, Wiley.	☒
Further	Ramage, M. and Shipp, K. (2009) *Systems Thinkers*, Springer.	☒
Further	ACM Transactions on Information Systems	☒
Further	Journal of Data and Information Quality	☒
Further	Journal of the ACM	☒
Further	Journal of Systems Engineering and Electronics	☒

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

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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
TOTAL	**100%**

INDICATIVE READING LIST

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

Module Code	**ACDB4010**
Title	**Study Skills**
Date	**17/08/2022**
Level	**4**
Credits	**10**
Pre-Requisites	**None**

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%
TOTAL	**100**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

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

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

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%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

INDICATIVE READING LIST

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

Further	Lawrence, N., Wadhawan, J. and Compton, R. (1999) *Foundations of Physical Chemistry: Worked Examples - Oxford Chemistry Primers,* Oxford : OUP	☐
Further	Ritchie, G. and Sivia, D.S. (2000) *Foundations of Physics for Chemists - Oxford Chemistry Primers,* Oxford : OUP	☐
Further	Sivia, D.S. and Rawlings, S.G. (1999) *Foundations of Science Mathematics - Oxford Chemistry Primers* , Oxford : OUP	☐
Further	Winterton, R.H.S. (1997) *Heat Transfer - Oxford Chemistry Primers,* Oxford : OUP	☐
Further	Brouard, M. (1998) *Reaction Dynamics - Oxford Chemistry Primers,* Oxford : OUP	☐

Module Code	**ACHA4008**
Title	**Integrating Project**
Date	**14/05/2020**
Level	**4**
Credits	**20**
Pre-Requisites	**None**

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:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	**200**	**100%**

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%
TOTAL	**100%**

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	☒
Further	Newton, R. (2016), Project Management Step by Step, FT Publishing International	☒
Further	Hughes, B. (2015), 5th Edition Project Management for IT-Related Projects, British Computer Society	☒
Further	Christopher, D (2013) Computing Projects, Pearson Education	☐
Further	Berndtsson, T (2012) Planning and Implementing your Project, Sringer Verlang	☐
Further	Cottrell, S.(2011) Critical Thinking Skills: Developing Effective Analysis and Argument, Palgrave Macmillan	☐
Further	Collis, J., Hussey, R (2009) Business Research: a Practical Guide for Undergraduate and Postgraduate Students, Palgrave Macmillan	☐

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

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%
TOTAL	**200**	**100%**

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	
TOTAL	**100%**

INDICATIVE READING LIST

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

Further	Living Lines Library https://livlily.blogspot.com/	☒
Further	Animation World Network https://www.awn.com/	☒
Further	KUNDERT-GIBBS, J. (2009) *Action! Acting Lessons for CG Animators* London: John Wiley & Sons	☐