

MODULE DIRECTORY

LEVEL 6

SCHOOL OF COMPUTING

FACULTY OF SCIENCE AND ART

2026-2027

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INTRODUCTION

This Module Directory includes all the modules for Level 6 within the School of Computing in the academic year 2026-2027.

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 School/Faculty. 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 Faculty 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	ACCA6011
Title	Artificial Intelligence and Machine Learning
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop students' systematic understanding of AI and machine learning principles and techniques used in Software Engineering, Games, Visualisation and Interactive Applications.

LEARNING OUTCOMES

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

- Critically analyse, evaluate and apply A.I. and machine learning methods to solve given problems.
- Analyse practical problems and synthesise appropriate software solutions using selected AI/machine learning methods.

INDICATIVE CONTENT

- Definition and review of Artificial Intelligence, General History, Contextualised AI eg Games AI.
- Review of probability and statistics
- Trigger systems, terrain analysis, obstacle evasion, movement, influence maps
- Decision-making and the development of methods for controlling and implementing behaviour of agents, for example, fuzzy logic, knowledge representation, state machines. rule-based systems, decision trees, etc.
- Search, Local search methods
- Evolutionary computing.
- Machine Learning: unsupervised/ supervised learning, Classifying, Naïve Bayes, Clustering, K-means, Function approximation/ neural nets, Bayesian networks

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
Implementation	2500-word equivalent	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6011	
Module Title	Artificial Intelligence and Machine Learning	
Classification	Reading List entry	Electronic*
Essential	Russell, S. and Norvig, P. (2016) Artificial Intelligence: A Modern Approach (3rd edition) Prentice Hall	☒
Essential	Millington, I. (2019) Artificial Intelligence for Games, 3 rd edition, CRC Press	☒
Essential	Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. O'Reilly	☒
Further	Bishop, C.M. (2006) Pattern Recognition and Machine Learning, Springer	☐
Further	Mark, D. (2009) Behavioral Mathematics for Game AI, Delmar	☐
Further	Schwab, B. , AI Game Engine Programming (2nd Edition), Charles River Media (2009)	☐
Further	Barber, M. (2012) <i>Bayesian Reasoning and Machine Learning</i> , Cambridge University Press	☐

Module Code	ACCA6020
Title	Independent Project
Date	19/05/2025
Level	6
Credits	40
Pre-Requisites	None

AIM(S)

- To develop the ability of students to engage critically and innovatively with theory and/or practice relevant to their studied subject areas in order to produce a discipline specific in-depth project.

LEARNING OUTCOMES

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

- Demonstrate intellectual skills in the identification of an appropriate topic, problem or challenge for investigation pertinent to their field of study and formulate a suitable plan for further research utilising relevant investigative methods in order to produce a response.
- Evidence in-depth knowledge and critical understanding of principles necessary to underpin their education within their chosen field of study and problem solving techniques applicable to this.
- Evidence independence of thought and critical evaluation in the production of an independent piece of work, demonstrating transferable skills through exercising initiative and personal responsibility in planning own learning and self-management.
- Organise their knowledge and learning through use of a range of media, and present their work appropriately in a manner that can be understood by specialist and non-specialist audiences.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

B14 Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems.

B15 Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters.

B18 Plan and record self-learning and development as the foundation for lifelong learning/CPD.

INDICATIVE CONTENT

- Research paradigms, methods, and techniques of research and enquiry.
- Conducting and writing literature reviews.
- Ethical concerns and the research process.
- Resource, project, and skills management processes and techniques.
- Presenting and illustrating data and information.
- Communication of general, specialist, technical ideas and results.
- Problem solving, creative, entrepreneurial thinking and approaches.
- Collaboration, adaptability and reflection.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	36	9%
Independent learning	364	91%
Placement learning	0	0%
TOTAL	400	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Portfolio	Minimum of 3 elements (equivalent to 10,000 words)	100%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

B14 Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems.

B15 Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters.

B18 Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Assessment Summary

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

INDICATIVE READING LIST

This will be guided by the student's individual project.

Module Code	ACCA6020	
Module Title	Independent Project	
Classification	Reading List entry	Electronic*
Essential	Cottrell, S. (2015) <i>Skills for Success Personal Development and Employability</i> , 3 rd edition, Palgrave. London.	☒
Essential	ASET, 2013 <i>Good Practice Guide for Workbased Learning and Placement Learning in Higher Education</i>	☒
Essential	Gray, D.E. (2018) <i>Doing Real World Research</i> , London: SAGE.	☐
Further	Gallagher, K. (2016) <i>Essential Study and Employment Skills For Business and Management Students</i> , Oxford	☐
Further	Gottschall, J. (2013) <i>The Storytelling Animal: How Stories Make Us Human</i> , Houghton Mifflin	☐
Further	Storr, Will (2020) <i>The Science of Storytelling</i> , William Collins	☐
Further	Cohen, L., Manion, L. and Morrison, K. (2017) <i>Research Methods in Education</i> , 8 th edition London: Routledge.	☒
Further	Flick, U. (2014) <i>An Introduction to Qualitative Research</i> , London: SAGE.	☐
Further	Aubrey, K. and Riley, A. (2017) <i>Understanding and Using Challenging Education Theories</i> , London: SAGE.	☒
Further	Brinkmann, S. and Kvale, S. (2018) <i>Doing Interviews (Qualitative Research Kit)</i> . Sage	☐
Further	Gibbs, G. (2018) <i>Analysing Qualitative Data (Qualitative Research Kit)</i> . Sage	☒
Further	Creswell, J. W. (2012). <i>Qualitative inquiry and research design: Choosing among five approaches</i> . Sage	☐
Further	Obschonka, M., Hakkarainen, K., Lonka, K. et al. Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood. <i>Small Bus Econ</i> 48 , 487–501 (2017). https://doi.org/10.1007/s11187-016-9798-6	☒
Further	https://ec.europa.eu/jrc/en/entrecomp	☒

Module Code	ACCA6021
Title	Graphics and Games Programming
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To achieve a systematic understanding of core Graphics & Games Programming principles and techniques including the use of graphics APIs, mathematical principles and related algorithms and data structures used to create complex graphical scenes.

LEARNING OUTCOMES

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

- Select, analyse and deploy suitable algorithms and techniques to solve given problem specifications.
- Apply their knowledge and understanding to develop 3D graphics applications using industry standard development tools and application programming interfaces (APIs).

INDICATIVE CONTENT

- Graphics hardware/terminology
- Development tools
- Graphics platform APIs e.g. DirectX, OpenGL
- Application of suitable programming languages (C/ C++)
- Hardware acceleration and the graphics pipeline.
- Transformations, object, world and camera spaces
- Projections, perspective
- Clipping and hidden surface removal
- Rasterization
- Rendering Algorithms

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
Coursework	1600 words	40%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment	2400 words	60%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6021	
Module Title	Graphics and Games Programming	
Classification	Reading List entry	Electronic*
Essential	Hearn, D and Baker, P.M (2013) Computer Graphics with OpenGL, Prentice Hall 4 th Edition	☒
Essential	Kessenich, Sellers, Shreiner (2016) OpenGL® programming guide: the official guide to learning OpenGL®, version 4.5 with SPIR-V, 9 th Edition, Addison Wesley.	☒
Further	Foley, VanDam, Feiner, Hughes (2013), Computer Graphics: Principles and Practice 3rd edition, Addison Wesley	☐
Further	Van Verth, J.M, Bishop, L.M (2015) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann	☐
Further	Hill, F.S. and Kelley, S. M, (2015) Computer Graphics using OpenGL, 3rd Edition, Prentice Hall International Inc.	☐

Module Code	ACCA6022
Title	Switching, Routing and Wireless
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To study the technical issues related to routing and switching techniques, to have an in-depth knowledge of architecture, components, and operations of routers and switches in a larger and more complex network.

LEARNING OUTCOMES

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

- Demonstrate a detailed understanding of theoretical and practical knowledge relating to routing and switching concepts.
- Implement routing and switching techniques within a network infrastructure, configure routing protocols, VLANs and perform network maintenance.

INDICATIVE CONTENT

- Switching concepts – layer 2 & 3
- Routing concepts – Static and dynamic, implementation and troubleshooting
- Routing Information Protocol v1 & v2
- Virtual Local Area Networks (VLANs)
- Inter VLAN routing
- Spanning tree protocols
- VLAN Trunking protocols and Dynamic Trunking protocols
- LAN Security concepts and implementation
- Wireless LAN

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
Practical portfolio	Students will complete practical works as an in-class tests or as a workshop journal	75%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Online test	1 hours	25%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	25%
Practical	75%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACCA6022	
Module Title	Switching, Routing and Wireless	
Classification	Reading List entry	Electronic*
Essential	www.netacad.com username and password is required	☒
Essential	Switching, Routing, and Wireless Essentials Companion Guide (CCNAv7) Published Aug 18, 2020 by Cisco Press . Part of the Companion Guide series. ISBN-10: 0-13-672935-5 ISBN-13: 978-0-13-672935-8	☒
Further	Scaling Networks Essentials v6 Companion Guide by Cisco Networking Academy, Cisco Press. Published Aug 3, 2017	☒
Further	W Odom (2019) CCNA 200-301 Official Cert Guide Library, Cisco Press part of the Official Cert Guide series	☐

Module Code	ACCA6023
Title	Enterprise Networking, Security and Automation
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To study the technical issues related to advance routing protocols and switching techniques within network infrastructure. To have a detailed knowledge of interior and exterior gateway routing protocols, various switching techniques and to understand the fundamental technical principles underlying autonomous systems.

LEARNING OUTCOMES

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

- Demonstrate a conceptual understanding of WAN technologies and protocols used in enterprise networks.
- An ability to design, deploy and troubleshoot enterprise networks, security measures and automation techniques.

INDICATIVE CONTENT

- Advanced routing protocols, distance vector and link state routing protocols
- OSPF – single and multi-area
- Network design and management
- Network security concepts
- Access control lists
- Network Address Translation for IPv4 & IPv6
- Virtual Private Networks and IPSec concepts
- Network QoS
- Network virtualisation and automation

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
Practical portfolio	Students will complete practical works as an in-class tests or as a workshop journal	75%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Online exam	1hours	25%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	25%
Practical	75%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACCA6023	
Module Title	Enterprise Networking, Security and Automation	
Classification	Reading List entry	Electronic*
Essential	www.netacad.com username and password is required	☒
Essential	Enterprise Networking, Security, and Automation Companion Guide (CCNAv7), By Cisco Networking Academy, Published Jul 16, 2020 by Cisco Press. Part of the Companion Guide series ISBN-13: 978-0-13-663432-4	☒
Essential	Scaling Networks v6 Companion Guide by Cisco Networking Academy, Cisco Press. Published Aug 3 2017	☒
Further	W Odom (2019) CCNA 200-301 Official Cert Guide Library, Cisco Press part of the Official Cert Guide series	☐

Module Code	ACCA6024
Title	Cloud-Based Web Services
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To give students an understanding of advanced web development concepts and how they are to be deployed in a cloud environment.

LEARNING OUTCOMES

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

- Understand the theoretical concepts which underpin cloud-hosted web development.
- Design, develop, test and deploy a web application in a cloud environment.

INDICATIVE CONTENT

- Web development frameworks (e.g. node.js)
- Web service-based applications, especially RESTful Web Services
- Object-relational mapping (ORM)
- Cross-Origin Resource Sharing (CORS)
- Asynchronous JavaScript And XML (AJAX)
- Testing
- Developing containerised web applications.
- Database web programming, e.g. SQL/NoSQL.
- Microservices.
- PaaS deployment of web applications.
- Scaling of web applications in the cloud (horizontal vs vertical scaling).

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
Implementation + Essay	2500-word equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Implementation + Essay	2500-word equivalent	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6024	
Module Title	Cloud-Based Web Services	
Classification	Reading List entry	Electronic*
Essential	J. Verona (2018), Practical DevOps: Implement DevOps in your organization by effectively building, deploying, testing, and monitoring code, 2nd Edition, Packt Publishing	☐
Further	S. Kane (2018), Docker: Up & Running: Shipping Reliable Containers in Production, O'Reilly Media	☐
Further	ACM	☒
Further	IEEE	☒

Module Code	ACCA6026
Title	Data Warehousing and Data Mining
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide students with a comprehensive and systematic understanding of the concepts underlying modern data warehouse systems. The student's technical skills will be extended to allow them to extract business intelligence from a dataset using both data analysis and data mining tools.

LEARNING OUTCOMES

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

- Analyse critically the structure, capabilities and role of a data warehouse within a modern business environment.
- Select and perform appropriate data analysis and reporting on data within a data warehouse environment and critically evaluate the results
- Provide business intelligence through the creative application of appropriate data mining processes and the critical evaluation of their results.

INDICATIVE CONTENT

- Source systems, data warehouses and data marts, dimensional modelling
- Business requirements, ETL process, data cleaning
- Reporting systems, data presentation, dashboards
- Data analysis and data mining; clustering, classification, time series analysis
- Data governance and data protection

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	2500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	2500 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6026	
Module Title	Data Warehousing and Data Mining	
Classification	Reading List entry	Electronic*
Essential	Loth, A., (2019) <i>Visual Analytics with Tableau</i> , Wiley	☒
Essential	Kimball, R. & Ross, M. (2016) <i>The Kimball Group Reader: Relentlessly Practical Tools for Data Warehousing and Business Intelligence</i> , Wiley	☒
Further	• Few, S. (2012), <i>Show Me The Numbers</i> , Analytics Press, Burlingame, CA.	☒
Further	Witten, I.H., Elbe, F., Hall, M.A., & Pal, C.J. (2016), <i>Data Mining: Practical Machine Learning Tools and Techniques</i> , Morgan Kaufmann.	☒

Module Code	ACCA6027
Title	Software Engineering Principles and Practice
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To enable students to evaluate and deploy appropriate software methodologies, software development methods, tools and techniques in the design and development of web applications following professional practices.

LEARNING OUTCOMES

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

- Critically evaluate software development approaches, software development methodologies, software design techniques and software testing
- Demonstrate a sound understanding of team work principles and practice
- Apply software development principles, patterns and techniques in the development of web application software

INDICATIVE CONTENT

- Software development process and approaches e.g. Software Development Life-Cycle (SDLC), Agile, SCRUM
- Software development methodologies and approaches e.g. Waterfall, Spiral, Iterative Development, RUP
- Software development methods e.g. Feature Driven Development
- Software design methods e.g. User Stories vs Use Cases, Class Diagrams
- Software testing e.g. Black Box vs White Box, Unit Testing, Equivalence Partitioning
- Software quality and complexity e.g. coding standards, Cyclomatic complexity
- Software development tools for collaboration e.g. version control
- Software design principles e.g. cohesion vs coupling
- Software design patterns e.g. Singleton, Factory Pattern
- Web Engineering approaches e.g. server-side vs client-side testing approaches, usability testing

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 and Implementation	5000 words equivalent	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6027	
Module Title	Software Engineering Principles and Practice	
Classification	Reading List entry	Electronic*
Essential	Sommerville, I. (2015), Software Engineering, , Pearson	☒
Essential	Thomas, D., Hunt, A., (2019), The Pragmatic Programmer: your journey to mastery, 20th Edition	☒
Further	Gamma, E., Helm, R. Johnson, R., Vlissides, J., (1994), Design patterns : elements of reusable object-oriented software, Addison Wesley	☒
Further	Martin, R., (2008), Clean Code: A Handbook of Agile Software Craftsmanship, Prentice Hall	☒
Further	Adewole, A., (2018) C# and .NET Core Test Driven Development: Dive into TDD to create flexible, maintainable, and production-ready .NET Core application, Packt Publishing	☒
Further	Sutherland, J., (2015) Scrum: The Art of Doing Twice the Work in Half the Time, Random House Business	☒
Further	Skarin, M., (2015), Real-World Kanban: Do Less, Accomplish More with Lean Thinking, Pragmatic Bookshelf	☒

Module Code	ACCA6028
Title	Socket Programming and Concurrency
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide the student with the major concepts involved in the implementation, testing and debugging of scalable, concurrent applications.

LEARNING OUTCOMES

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

- Critically appraise the major concepts, principles and practice to design web services.
- Demonstrate a comprehensive knowledge and understanding of complex client/server concepts, principles and tools to build, test, debug and critically evaluate software components in scalable, distributed applications.

INDICATIVE CONTENT

- Network programming e.g. BSD sockets. Including UDP/TCP clients and servers, byte ordering, etc.
- Real-time multiplayer/multiuser development with particular focus on multithreading and processing, including critical regions, mutexes, semaphores, etc
- Remote method execution between components and an application front-end (for example, RMI interface).
- Concurrency including race conditions, semaphores, mutexes, async, etc.
- Service-Oriented Architectures (SOA)
- Multithreading
- Message Passing Interface
- Dispatch models.
- Use of threads within distributed components.
- Messaging and message queues for passing information

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
Implementation + report	2500 word equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	2500 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6028	
Module Title	Socket Programming and Concurrency	
Classification	Reading List entry	Electronic*
Essential	Subbu Allamaraju. RESTful Web Services Cookbook. 2010, Yahoo Press	☐
Essential	Rian Quinn. Hands-On System Programming with C++: Build performant and concurrent Unix and Linux systems with C++17. 2018, Packt Publishing	☐
Further	Balachandar, B. M. RESTful Java Web Services: A pragmatic guide to designing and building RESTful APIs using Java. 2018 3rd Edition, Packt Publishing	☐
Further	ACM	☒
Further	IEEE	☒
Further	Computer Networking	☒
Further	Data Communications	☒

Module Code	ACCA6029
Title	Industrial Based Research
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide the students with the ability to critically analyse and research complex industry-related problems and/or systems. This includes development of appropriate system requirements for work-based projects.

LEARNING OUTCOMES

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

- Review and implement appropriate research methods for investigating a problem relevant to the employer.
- Communicate an in-depth understanding of the problem on the context of the organisation's needs and current research.
- Manage resources appropriately including collaboration with experts within the organisation.

INDICATIVE CONTENT

- Research methodologies for industrial research
- Research and investigative skills relevant to the student's workplace
- Work design and technology: for example, business process re-engineering, work redesign options such as job rotation, job enlargement, job enrichment.
- Stimulants/drivers for change: for example, technology, nature of the workforce, social trends, competition, etc.
- Appropriate development and structuring of an industrial research proposal: problem identification, formulating aims/hypotheses, sampling, ethical issues and the practicalities of design

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	10	5%
Independent learning	180	90%
Placement learning	10	5%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Presentation / Demo	15 minutes	25%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Reflective Industrial Research Report	4,000 - 5,000 words	75%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	75%
Practical	25%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACCA6029	
Module Title	Industrial Based Research	
Classification	Reading List entry	Electronic*
Essential	Marder, M. (2011) Research Methods for Science, Cambridge University Press: Cambridge	☒
Essential	Hughes, B. (2015), 5th Edition Project Management for IT-Related Projects, British Computer Society	☒
Further	http://www.acm.org	☒
Further	http://www.ieee.org	☒
Further	http://www.bcs.org	☒
Further	http://www.theregister.co.uk	☒

Module Code	ACCA6031
Title	Advanced Character Performance
Date	08/12/2021
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To advance and evaluate the necessary performance characteristics embedded in a relevant field of animation, VFX, games (etc.)
- To create and enhance and cultivate levels of performance animation and representations of motions in animated scene(s)

LEARNING OUTCOMES

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

- Advance the (internal) psychological and (eternal) acting stages when capturing motion, performance, gesture and body mechanics in an animation to an audience
- Enhance the interpretive qualities inherent within presenting appealing and engaging and stylistic qualities in the animation of characters and/or sequences.

INDICATIVE CONTENT

- Research and analysis of visual performance material and self-sustained visual research.
- Advancing the implementation of the principles of animation/character animation with embracing the use of body shaping, facial expressions, visemes, etc.
- Identifying personality and character and archetypes (and stereotypes)
- Technical composition and animated design for film, visual effects/motion capture, etc.
- Acting techniques and acting for animation
- Heightened body mechanics and animated representations in 3D space
- Biological studies and analysis
- Key posing, layouts, breakdowns and progression reels
- Cameras, blocking, mise-en-scene, framing (etc.)
- Scene development; cinematically and/or within performance aspects of VFX, Games (etc.)
- Psychological gesturing and internal/external forms (acting/staging) of expression in the human form

- Digital manipulation and composition of traditional/mechanical characters and props (e.g. digital puppetry and/or integration)
- Technically orientated exercises and simulations will incorporate other studies (e.g. bio-medical systems, effects upon physical bodies) and what is required to present these via 3D technology,
- Classes and exercises will also capitalise on observations and analysis of cinematic conventions and motions

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
Presentation	An analytical presentation that conducts a study on a range of approaches to a given scenario/scene (using case studies) (5 minutes)	30%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Portfolio	A directed study (via component #1) in advancing a chosen/selected scene version and to create a version or series of animated 'takes' (equivalent to 3,000 words)	70%

Assessment Summary

Activity type	Percentage
Written exam	
Coursework	70%
Practical	30%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACCA6031	
Module Title	Advanced Character Performance	
Classification	Reading List entry	Electronic*
Essential	Roberts, S (2004) <i>Character Animation in 3D: Use Traditional Drawing Techniques To Produce Stunning CGI Animation</i> , London: Focal Press.	☐
Essential	Beiman, N (2015) <i>Animated Performance: Bringing Imaginary Animal, Human and Fantasy Characters to Life</i> , London: Fairchild Books	☒
Essential	Kundert-Gibbs, J., (2009) <i>Action! Acting Lessons for CG Animators</i> , London: John Wiley & Sons	☐
Essential	Johnson, O. & Thomas, F. (1995) <i>The Illusion of Life: Disney Animation</i> London: Hyperion Press	☐
Essential	Williams, R. (2002). <i>The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators</i> London: Faber & Faber	☐
Essential	Hooks, E. (2003) <i>Acting for Animators: A Complete Guide to Performance Animation</i> London: Heinemann	☐
Further	Lasseter, J. (1987) "Principles of Traditional Animation Applied to 3D Computer Animation", <i>Computer Graphics</i> , pp. 35-44, 21:4, July 1987 (SIGGRAPH 87).	☒
Further	Ed Hooks (Acting for Animation) http://www.edhooks.com/archives.html	☒
Further	Living Lines Library https://livlily.blogspot.com/	☒
Further	50 most influential Animators https://50mostinfluentialdisneyanimators.wordpress.com/	☒
Further	Animation World Network https://www.awn.com/	☒

Module Code	ACCA6033
Title	Personal Portfolio Development
Date	08/12/2021
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To foster critical evaluation, reflection, and interpretation relevant to the individual students' practice and enable students to promote and present themselves professionally and with confidence.
- To allow opportunities and considerations for exit strategies and career path proposals that can be followed upon graduation

LEARNING OUTCOMES

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

- Demonstrate self-reflective and critical thinking abilities in preparing, advertising and marketing themselves, and in considering appropriate work to advertise their skillsets
- Produce material that showcases specialities within their chosen industry pathway that could be used for self-promotion in a professional capacity

INDICATIVE CONTENT

- Development of critical thinking and analytical abilities
- Visual portfolio layouts, arrangement and editing (for marketing purposes)
- Creation, analysis and development of relevant self-promotion tools and techniques
- Showreel advice – creation, length and review of content
- Developing social online content and networking opportunities
- Building an online brand and social media networking / connections
- Promotional development techniques
- Mission statements and objectives
- Internships, placements, client liaisons and professionalism

Some of the student work is orientated towards preparing for the end of the award and Degree Show, which offers a major opportunity for the students to show their work publicly and acts as a springboard for future employment.

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	4-6 elements, eg imagery and promotional material, digital show reel (equivalent to 5,000 words)	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6033	
Module Title	Personal Portfolio Development	
Classification	Reading List entry	Electronic*
Essential	Bolton, G. (2014) <i>Reflective Practice: Writing and Professional Development</i> London: Sage	☐
Essential	Cottrell, S. (2010) <i>Skills for Success: Personal Development and Employability</i> London: Palgrave MacMillan	☐
Essential	Miller, D. (2017) <i>Building a Story Brand: Clarify your Message So Customers Will listen (illustrated edition)</i> London: Harper Collins Leadership	☐
Further	Media, M. (2021) <i>Social Media Marketing 2021</i> , Independently published.	☒
Further	Kingsnorth, S. (2019) <i>Digital Marketing Strategy: An Integrated Approach to Online Marketing</i> London: Kogan Page	☒
Further	Theobald, T. (2019) <i>Develop Your Presentation Skills: How To Inspire And Inform With Clarity And Confidence.</i> London: Kogan Page.	☒
Further	Clazie, I. (2010) <i>Creating your Digital Design Portfolio: A Practical Guide For Showcasing Your Work Online.</i> London: Rotovision.	☐

Further	Tharp, T. (2008) <i>The Creative Habit: Learn it and Use It For Life</i> . London: Simon & Shuster.	☐
Further	http://www.ipo.gov.uk/ The UK Intellectual Property Office http://www.nesta.org.uk The National Endowment for Science and the Arts http://www.own-it.org/ Intellectual Property Advice for Creative Businesses (University of the Arts London and London College of Communication) http://www.deviantart.com/ http://www.linkedin.com/ http://twitter.com/	☒
Further	Journal of Writing in Creative Practice Journal of Arts Marketing Subject-specific journals related to students' individual practice	☐

Module Code	ACCA6034
Title	User Experience Design
Date	08/12/2021
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To support students in the development of pervasive and engaging user experiences, in particular those focussed on media-rich multi-modal interaction with ubiquitous and personal computing devices. Students will gain experience of prototyping and testing of single-user and multi-user interactions within a games design environment.

LEARNING OUTCOMES

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

- Critically reflect upon current design practice, selecting appropriate techniques and technologies for a wide range of interactions.
- Research user needs within both personal and social interactivity spheres for unconstrained problems.
- Select and apply appropriate UX methodologies and good practices to prototype innovative interaction within a social context.
- Critically analyse and reflect upon the results of UX testing.

INDICATIVE CONTENT

- Principles and techniques of UX/user-centred design; best practices; criticisms
- Human beings; ergonomics, psychophysics, psychology, perception and cognition
- UX Elements; visual design, information architecture, interaction design, usability, multimodality
- Interaction requirements; social and emotional requirements; single-user and multi-user interactions
- Prototyping, modelling, patterns, personae; scenarios; gamification
- UX testing; designing and running testing workshops

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
Coursework	2,500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Coursework	2,500 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA6034	
Module Title	User Experience Design	
Classification	Reading List entry	Electronic*
Essential	Allanwood, G. and Beare, P. (2019) <i>User Experience Design: A Practical Introduction (2nd ed)</i> London: Bloomsbury Visual Arts	☒
Essential	Krug, S. (2013), <i>Don't Make me Think Revisited</i> . Voices That Matter	☒
Essential	Pannafino, J. and McNeil, P. (2017) <i>UX Methods: A Quick Guide To User Experience Research Methods</i> CDUXP Books	☐
Further	Norman, D. (2013) <i>The Design of Everyday Things (revised and expanded edition)</i> London: MIT Press	☐
Further	Garrett, J.J. (2010) <i>The Elements of User Experience</i> . London: Voices That Matter	☒

Further	Soegaard, M. and Dam, R. D. (Eds) (2013) <i>Encyclopedia of Human-Computer Interaction</i> (2 nd ed) London: The Interaction Design Foundation	☒
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Module Code	ACCB6000
Title	Advanced Cyber Security
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide students with Cyber Security concepts and a deep understanding of how they are applied using Internet technologies. Students will gain a thorough understanding of up-to-date security threats and vulnerabilities posed to the Internet and an understanding of the legal, policy and technical approaches that are necessary to mitigate such risks.

LEARNING OUTCOMES

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

- Demonstrate a systematic understanding of a wide range of current research and technological advances in Cyber Security.
- Consistently apply the principles and practices of Cyber Security for mitigating the key technical internet security vulnerabilities and threats that organisations face.

INDICATIVE CONTENT

- Fundamentals of Computer Security.
- Networking Concepts.
- Cryptography.
- Internet Security Technologies.
- Security of Computer Communications.
- Wireless Security.
- Windows Security.
- Linux Security.
- Web Applications and Security.
- Defensive Network Infrastructure – Intrusion Detection/Firewalls.
- Malware, Virus and Worms.
- Network Traffic Analysis and Forensics using Wireshark.
- Data Loss Prevention.

- Penetration Testing.

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	5000 words equivalent	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCB6000	
Module Title	Advanced Cyber Security	
Classification	Reading List entry	Electronic*
Essential	The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws, 2ed. Author: D. Stuttard.	☒
Essential	Cisco CyberOps Associate CBROPS 200-201 Official Cert Guide By Omar Santos Published Dec 10, 2020 by Cisco Press. Part of the Certification Guide series. Copyright 2021 ISBN-10: 0-13-680783-6 ISBN-13: 978-0-13-680783-4	☒
Essential	Cracking the Coding Interview: 189 Programming Questions and Solutions 6th Edition. Author: Gayle Laakmann.	☒
Essential	Basic Security, Penetration Testing and How to Hack. Author: Isaac Sharpe.	☐
Essential	Cyber Insecurity: Navigating the Perils of the Next Information Age. Author: Richard Harrison.	☒
Essential	Counter Hack Reloaded: A Step-by-Step Guide to Computer Attacks and Effective Defenses (2nd Edition) 2nd Edition. Authors: Edward Skoudis, and Tom Liston.	☒
Essential	www.netacad.com username & password required	☒
Further	Applied Cryptography: Protocols, Algorithms and Source Code in C. Author: Bruce Schneir. (2015)	☒
Further	The Art of Exploitation, 2nd Edition. Author: Jon Erickson.	☐

Further	Beginner to Expert Guide to Computer Hacking, Basic Security, and Penetration Testing (Computer Science Series) Kindle Edition. Author: James Patterson.	☐
Further	Hacking for Beginners – Computer Virus, Cracking, Malware, IT Security (Cyber Crime, Computer Hacking, How to Hack, Hacker, Computer Crime, Network Security, Software Security), Author: Joseph Connor.	☐
Further	Journals IEEE/ACM, IEEE/ACM Transactions on Networking IEEE, IEEE Network Magazine Science Direct Scopus ACM Transactions on Database Systems ACM Transactions on Information Systems	☒
Further	Websites http://www.veracode.com/directory/owasp-top-10 http://www.vulnerabilityassessment.co.uk/Penetration%20Test.html http://www.softwaretestinghelp.com/penetration-testing-tools/ https://www.owasp.org/index.php/Main_Page DoD Cyber Crime Center (http://www.dc3.mil) http://www.digitalforensicsmagazine.com/ www.dvwa.co.uk	☒

Module Code	ACCB6014
Title	GPU Programming
Date	09/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- Critically evaluate the principles and techniques used in GPGPU programming for games development, emphasising strategies for real-time optimizations of algorithms and techniques required to simulate, animate and render graphical scenes used in games programming.

LEARNING OUTCOMES

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

- Critically evaluate suitable strategies and techniques used in real-time graphics rendering utilizing GPU hardware acceleration.
- Synthesize appropriate GPU techniques and algorithms to address complex graphical programming problems

INDICATIVE CONTENT

- Graphics hardware/terminology and games platforms.
- Hardware acceleration and the shader graphics pipeline.
- Shader development tools.
- Illumination models, HDRI, BRDFs
- Stereoscopic output for virtual reality displays.
- Pixel, vertex and geometry shader development.
- Texture mapping / baking techniques – hemisphere, reflection, specular mapping, bump mapping, parallax mapping
- Shadow mapping.
- Particle systems
- Fluids
- Procedural Texturing and Animation techniques.
- Emerging technologies, methods and techniques used to model photo-realistic scenes in real-time.
- Representing parametric curves and surfaces

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	2,000 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCB6014	
Module Title	GPU Programming	
Classification	Reading List entry	Electronic*
Essential	Kessenich, Sellers, Shreiner (2016) OpenGL® programming guide: the official guide to learning OpenGL®, version 4.5 with SPIR-V, 9 th Edition, Addison Wesley.	☒
Essential	Akenine-Moller, T and Haines, E, (2018), Real Time rendering, 4 th Edition. A.K Peters	☒
Further	Ebert, Musgrave, Peachey, Perlin, Worley, (2003) Texturing & Modelling. A Procedural Approach. 3 rd edition, Morgan Kaufmann	☒
Further	Hearn, D and Baker, P.M (2013) Computer Graphics with OpenGL, Prentice Hall 4 th Edition	☐

Further	Watt, Alan (1998) 3D Computer Graphics 2 nd Edition, Addison Wesley	☐
Further	Van Verth, J.M, Bishop, L.M (2004) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann	☐
Further	GPU Gems 1, 2 & 3. (2007) Programming Techniques, Tips and Tricks for Real-Time Graphics. Edited by Fernando, Pharr, Nguyen, Addison Wesley	☒

Module Code	ACCB6017
Title	Usability Engineering
Date	12/07/2021
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To build upon students' interface design skills to give the ability to apply and analyse techniques of usability engineering.

LEARNING OUTCOMES

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

- Research and evaluate cognitive and social information processing
- Select, apply and analyse critically techniques of interface evaluation
- Synthesize a solution to a complex design problem from the concepts and principles of usability engineering and software development
- Critically analyse, individually and as part of a team exercise, input and output hardware appropriate for specialised applications, for example for use by disabled people, and for three-dimensional modelling applications

INDICATIVE CONTENT

- Cognitive aspects of information: perception: sensory inputs and the human memory system; concept formation and knowledge representation; cognitive processing: attention, reasoning,
- The social aspect of information: semiotics and language; verbal and non-verbal languages
- Interface evaluation methods (for example, observation, verbal protocol analysis, structured expert reviewing).
- The scope and role of usability engineering methods (for example, task analysis, GOMS, communicating sequential processes).
- Usability engineering methodologies to create a suitable interface and their relation to the software design process.
- I/O devices for specialised design needs (for example, 3-dimensional interfaces and interfaces for users with disabilities).

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	2500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Essay	2500 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCB6017	
Module Title	Usability Engineering	
Classification	Reading List entry	Electronic*
Essential	Shneiderman, B (2017) <i>Designing the User Interface: Strategies for Effective Human-Computer Interaction (6th Edition)</i> , Addison-Wesley	☐
Further	Rogers Y, Sharp, H, & Preece, J (2015) <i>Interaction Design: Beyond Human-Computer Interaction. 4th Edition</i> , John Wiley & Sons, Inc	☐
Further	Lazar, J., Fend, JH and Hochheiser, H (2017) <i>Research Methods in Human-Computer Interaction 2nd Edition</i> , Wiley	☐
Further	MacKenzie, S. (2014) <i>Human-Computer Interaction: An Empirical Research Perspective</i> , Morgan Kaufmann	☐

Further	BCS Human Computer Interaction Group Proceedings	☐
Further	ACM Publications: Communications, Interactions, SIGCHI	☐
Further	http://www.usability.gov/	☒
Further	http://www.w3.org/standards/webdesign/accessibility Web accessibility standards	☒
Further	http://www.nngroup.com/articles/ Short usability articles from Jacob Neilson	☒

Module Code	ACCB6019
Title	Emerging Trends
Date	25/03/2021
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To enable students to demonstrate a theoretical or practical understanding of current technologies, concepts or practices.

LEARNING OUTCOMES

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

- Analyse the principles and concepts associated with an emerging field of computing such as the professional practices being adopted in industry, a novel technology or a new application of an existing technology.
- Evaluate the effectiveness, benefits, drawbacks or suitability of deploying appropriate technologies or approaches to the solution of a problem as part of a team and/or as an individual.

INDICATIVE CONTENT

- Current or emerging technologies within fields such as networking, web development, software applications, data analytics
- Software or network design methodologies
- Professional practices
- Testing approaches within programming, network implementations, usability, etc.
- Software tools and libraries such as network simulation tools, rootkits, graphics SDKs, game engines, software libraries, software development tools, testing tools, etc.
- Critical, analytical thinking and writing

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	May take the form of an essay, a presentation and/or an implementation 4000 words equivalent	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCB6019	
Module Title	Emerging Trends	
Classification	Reading List entry	Electronic*
Essential	The nature of this module requires up to date sources. These will be provided to the students during the module. Essential texts will change during the course of the module.	
Further	Bejtlich, R. (2015) The Tao of Network Security Monitoring: Beyond Intrusion Detection, Boston: Addison-Wesley	☒
Further	Stallings, W. (2017) Cryptography and Network Security: Principles and Practice (7th Edition), Pearson Education Limited	☒
Further	Sommerville, I. (2015), Software Engineering, , Pearson	☒

Module Code	ACDA6000
Title	Applied Programmable Logic Controllers
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To design and document hardware and software for control systems using industry standard methods. To implement a control system using PLC based hardware and software.

LEARNING OUTCOMES

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

- Design and implement appropriate algorithms using suitable industry standard software tools such as Siemens Step 7, with appropriate documentation to fulfil a control application scenario
- Design, critically analyse and document the hardware and software required for fault diagnostics, operator controls, and safe operation of a PLC.

INDICATIVE CONTENT

- PLC architectures and concepts,
- Sequence function charts,
- timing diagrams,
- ladder logic programming
- Instruction mode programming
- Functional block programming
- Dynamic system modelling
- Control Systems and controller 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

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment / Report	5,000 Words	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6000	
Module Title	Applied Programmable Logic Controllers	
Classification	Reading List entry	Electronic*
Essential	Jack, H. (2010) <i>Automating Manufacturing Systems with PLCs</i> Lulu.com	☒
Essential	Golnaraghi, F. and Kuo, B. (2017) <i>Automatic Control Systems</i> New York: McGraw Hill	☒
Further	Bolton, W. (2015) <i>Programmable Logic Controllers</i> Oxford: Newnes	☒

Module Code	ACDA6001
Title	Electronics II
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop an advanced appreciation of the structure and design of digital systems and finite state machines in particular.

LEARNING OUTCOMES

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

- Synthesise and critically evaluate of innovative VHDL designs through the use of state of the art simulation and synthesis software.
- Implement advanced digital designs including multi-input systems controllers.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

B17 Communicate effectively with technical and non-technical audiences.

INDICATIVE CONTENT

- Review of combinational and sequential circuit design including finite state machines.
- System controller design: system synchronisation, handshaking, state assignment, next state decoder, output decoder.
- PLDs and FPGAs.
- VHDL: model development, behavioural modelling, the VHDL language, program design, modelling FSMs.
- Schematic capture, synthesis and simulation tools for PLD and FPGA design (e.g. Mentor Graphics, Altera and Xilinx).

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	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

B17 Communicate effectively with technical and non-technical audiences.

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6001	
Module Title	Electronics II	
Classification	Reading List entry	Electronic*
Essential	Ashenden, P. (2007) <i>Digital Design (VHDL): An Embedded Systems Approach Using VHDL</i> Burlington, MA: Morgan Kaufmann	☒
Essential	Brown, S. and Vranesic, Z. (2008) <i>Fundamentals of Digital Logic with VHDL Design</i> New York: McGraw Hill	☐
Further	Haskell, R. and Hanna, D. (2015) <i>VHDL by Example</i> , Auburn Hills: LBE Books	☐

Module Code	ACDA6002 / ACDA6002A
Title	Electronic Systems Design
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To produce suitable system designs, using open-ended multi-disciplinary problems with a limited time period, and appreciating practical constraints.

LEARNING OUTCOMES

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

- Demonstrate the ability to deploy accurately established techniques to produce suitable system designs over a range of technological applications.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B13 Select and apply appropriate materials, equipment, engineering technologies and processes.

INDICATIVE CONTENT

- Appropriate theoretical methods for designing practical systems.
- Researching
- Planning

- Self-management
- Costing
- Design approaches
- PCB Design
- Report writing

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	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B13 Select and apply appropriate materials, equipment, engineering technologies and processes.

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6002 / ACDA6002A	
Module Title	Electronic Systems Design	
Classification	Reading List entry	Electronic*
Essential	Horowitz, P. and Hill, W. (2015) <i>The Art of Electronics</i> Cambridge: Cambridge University Press	☒
Essential	Sinclair, I. (2014) <i>Sensors and Transducers</i> Oxford: Newnes	☐
Essential	Wobschall, D. (1987) <i>Circuit Design For Electronic Instrumentation</i> New York: McGraw Hill	☐
Further	Patranabis, D. (2011) <i>Sensors and Transducers</i> _ New Delhi: PHI Learning	☐

Module Code	ACDA6002 / ACDA6002A
Title	Electronic Systems Design
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To produce suitable system designs, using open-ended multi-disciplinary problems with a limited time period, and appreciating practical constraints.

LEARNING OUTCOMES

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

- Demonstrate the ability to deploy accurately established techniques to produce suitable system designs over a range of technological applications.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B13 Select and apply appropriate materials, equipment, engineering technologies and processes.

INDICATIVE CONTENT

- Appropriate theoretical methods for designing practical systems.
- Researching
- Planning

- Self-management
- Costing
- Design approaches
- PCB Design
- Report writing

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	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

B13 Select and apply appropriate materials, equipment, engineering technologies and processes.

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6002 / ACDA6002A	
Module Title	Electronic Systems Design	
Classification	Reading List entry	Electronic*
Essential	Horowitz, P. and Hill, W. (2015) <i>The Art of Electronics</i> Cambridge: Cambridge University Press	☒
Essential	Sinclair, I. (2014) <i>Sensors and Transducers</i> Oxford: Newnes	☐
Essential	Wobschall, D. (1987) <i>Circuit Design For Electronic Instrumentation</i> New York: McGraw Hill	☐
Further	Patranabis, D. (2011) <i>Sensors and Transducers</i> _ New Delhi: PHI Learning	☐

Module Code	ACDA6004
Title	Power Electronics and Drives
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop in the student an in depth understanding of power electronic circuits and systems, their use in power supply and energy storage systems and their use in electrical drive systems.
- To develop the appropriate skills necessary for the analysis and design of power electronic systems including electrical drive systems.

LEARNING OUTCOMES

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

- Analyse and design power electronic systems employing established and emerging techniques.
- Analyse electrical drive systems and apply established and emerging techniques to ensure effective operation of these systems.

INDICATIVE CONTENT

- Power Electronic Converters - Power electronic components and circuits. AC to DC, DC to AC, DC to DC, and AC to AC conversion processes.
- Calculation of peak, mean and RMS values of voltage and current associated with each converter. Maximum Power Point Tracking. Grid synchronization. Calculation of harmonic distortion factors. Switching losses, conversion efficiency (for example in solar PV). Power factor calculations. Protection of devices.
- Switch Mode and Uninterruptible Power Supplies -Design and analysis of switch mode circuits and systems.
- Design and analysis of uninterruptible power supply systems, incorporating energy storage systems. Charge and discharge control algorithms for various battery types.
- DC and AC Motor Drives including an overview and analysis of electrical machine systems analysis of AC machine and DC machine systems and their representation by equivalent circuits.
- Application of power electronic converters to motors to provide variable speed and variable torque as required by electric vehicles.
- Analysis of electrical drive systems, consisting of DC and AC machines and a broad range of power electronic converters.

- Analysis and design of speed and torque control techniques for electrical drives, including vector control.

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	2,500 words equivalent	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	ACDA6004	
Module Title	Power Electronics and Drives	
Classification	Reading List entry	Electronic*
Essential	Rashid, M. H. (2011) <i>Power Electronics Handbook, Devices, Circuits and Application</i> Elsevier.	☒
Essential	Wildi, T. (2013) <i>Electrical Machines, Drives and Power Systems</i> . Boston: Prentice Hall.	☒
Essential	Mohan, N. (2011) <i>Power Electronics</i> Hoboken, NJ: Wiley	☐
Further	Vukosavic, S. (2013) <i>Electrical Machines (Power Electronics and Power Systems)</i> Springer.	☐
Further	Lander, C. W. (1993) <i>Power Electronics, 3rd Edition</i> . New York: McGraw Hill Higher Education.	☐

Further	Krishnan, R. (2001) <i>Electric Motor Drives Modelling, Analysis, and Control</i> . Boston: Prentice Hall.	☐
Further	Mohan, N., Undeland, T. M. and Robbins, W. P. (2002) <i>Power Electronics: Converters, Applications and Design</i> 3 rd ed Hoboken, NJ: Wiley	☐
Further	Fitzgerald, A. E., Kingsley, C. and Umans, S. D. (2002) <i>Electric Machinery</i> 6 th ed. New York: McGraw Hill Higher Education	☐
Further	Hughes, A. (2005) <i>Electric Motors and Drives: Fundamentals, Types and Applications</i> Oxford: Newnes	☐

Module Code	ACDA6018
Title	Advanced Digital Signal Processing and Communications
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop a critical, in depth understanding of the theories and concepts of digital signal processing and communications.

LEARNING OUTCOMES

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

- Critically evaluate digital signal processing and communication systems using suitable simulation software
- Design and evaluate using simulation software suitable solutions to communication systems problems

AHEP 4.0 LEARNING OUTCOMES DEVELOPED

B7 Evaluate the environmental and societal impact of solutions to broadly-defined problems.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

INDICATIVE CONTENT

- Fourier transforms & Fourier analysis
- Channel capacity, link budgets,
- Spectral efficiency
- Software defined radio

- Noise

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
Lab report	2,500 Words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B6 Apply an integrated or systems approach to the solution of broadly-defined problems.

B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 Hours	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6018	
Module Title	Advanced Digital Signal Processing and Communications	
Classification	Reading List entry	Electronic*
Essential	Couch, L. W. (2013) Digital & Analog Communication Systems, 8 th Edition, Pearson	☐
Essential	McClellan, J., Schafer, R and Yoder, M. (2017) DSP First, 2 nd Edition, Pearson	☐
Essential	Parker, M. (2017) <i>Digital Signal Processing 101: A Practical Guide</i> , Newnes.	☐
Further	Sklar, B. (2013) Digital Communications: Fundamentals and Applications, Pearson New International Edition	☐
Further	Journals IEEE Communications Magazine IEEE Signal Processing Magazine	☐
Further	Websites http://www.mathworks.co.uk	☐

Module Code	ACDA6019
Title	Advanced Radio Frequency Systems
Date	19/05/2025
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop in depth knowledge and understanding of RF transmission systems, and their uses in various communication systems.

LEARNING OUTCOMES

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

- Synthesise and critically evaluate RF transmission and reception systems through the use of simulation software
- Critically analyse RF antenna systems and their suitability to given applications.

AHEP 4.0 LEARNING OUTCOMES ASSESSED

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B7 Evaluate the environmental and societal impact of solutions to broadly-defined problems.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

B17 Communicate effectively with technical and non-technical audiences.

INDICATIVE CONTENT

- Antenna theory
- Common antenna radiation patterns
- Waveguides

- S Parameters
- Impedance matching, maximum power transfer, Standing wave ratio
- Transmission line theory

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
Lab report	2,500 words	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems.

B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

B7 Evaluate the environmental and societal impact of solutions to broadly-defined problems.

B12 Use practical laboratory and workshop skills to investigate broadly-defined problems.

B17 Communicate effectively with technical and non-technical audiences.

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

This assessment component assesses the following AHEP4.0 Learning Outcomes:

B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6019	
Module Title	Advanced Radio Frequency Systems	
Classification	Reading List entry	Electronic*
Essential	Huang, Y. and Boyle, K. (2008) Antennas from Theory to Practice, John-Wiley & Sons Ltd	☐
Essential	Kraus, J. and Fleisch, D. (2010) Electromagnetics with Applications, 5 th Edition, McGraw-Hill	☐
Essential	Collins, T.F., Getz, R., Pu, D. and Wyglinski A. M. (2018) Software-Defined Radio for Engineers, Artech House	☐
Further	Grayver, E. (2013) Implementing Software Defined Radio, Springer	☐
Further	Bird, J. (1997) Electrical Circuit Theory & Technology, Newnes	☐

Module Code	ACDA6020
Title	Advanced Chemistry of OME
Date	17/08/2022
Level	6
Credits	20
Pre-Requisites	Chemistry (OME)

AIM(S)

- To build on the concepts introduced in the level 4 Chemistry (OME) module. Expanding and extending ideas developed, introducing more detailed explanation of the chemical principles associated with the functioning of OME devices. Introduction of the concepts of materials chemistry and effects.

LEARNING OUTCOMES

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

- Critically analyse concepts of heat and thermodynamics, to explain the chemistry of solid phases and their interaction with other phases.
- Demonstrate a detailed understanding of reaction chemistry, ranging from complex chemical reactions to chemical compatibility of OME components.
- Analyse critically the design of chemical components for the lifetime of an OME system or device, from manufacture, through storage, use and/or disposal.

INDICATIVE CONTENT

- Advanced chemical reactions and chemical kinetics.
- Advanced System Thermodynamics and energy release.
- Materials chemistry – states of matter, phase transformations, polymers, crystals, glasses.
- Mechanical properties of the solid state.
- Chemical compatibility and testing methods.

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	6,000 words equivalent Group Presentation, Lab Report and Practical	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6020	
Module Title	Advanced Chemistry of OME	
Classification	Reading List entry	Electronic*
Essential	Akhavan, J. (2022) <i>The Chemistry of Explosives: Edition 4</i> , Cambridge : Royal Society of Chemistry	☒
Essential	JSP 333: <i>Services textbook of explosives</i> , (2020) Ministry of Defence.	☒
Further	Atkins, P. (2010) <i>The Laws of Thermodynamics: a Very Short Introduction</i> , Cambridge : Royal Society of Chemistry	☐
Further	Atkins, P., de Paula, J. and Keeler, J. (2017) <i>Atkins' Physical Chemistry</i> , Cambridge : Royal Society of Chemistry	☐
Further	Carrington, G. (1994) <i>Basic Thermodynamics</i> , Cambridge : Royal Society of Chemistry	☐
Further	Scott, S.K. (1995) <i>Beginning Mathematics for Chemistry</i> , Cambridge : Royal Society of Chemistry	☐
Further	Pilling, M.J. and Seakins, P.W. (1995) <i>Reaction Kinetics</i> , Cambridge : Royal Society of Chemistry	☐
Further	Agrawal, J.P. (2010) <i>High Energy Materials</i> , New Jersey : John Wiley	☐
Further	Klapötke, T. M. (2017) <i>Chemistry of High Energy Materials</i> , Berlin : de Gruyter	☐
Further	Maytas, R. and Pachman, J. (2013) <i>Primary Explosives</i> , New York : Springer	☐
Further	Janssen, T.J. (2011) <i>Explosive Materials: Classification, Composition and Properties</i> , Hauppauge, NY : Nova Science Publishers	☐
Further	Wayne, R.P. (1994) <i>Chemical Instrumentation - Oxford Chemistry Primers</i> , Oxford : OUP	☐
Further	Metcalfe, I.S. (1997) <i>Chemical Reaction Engineering, a First Course - Oxford Chemistry Primers</i> , Oxford : OUP	☐

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

Module Code	ACDA6021
Title	Data Capture and Evaluation
Date	17/08/2022
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To explore and evaluate the methods of data capture used during any OME research & development and test & evaluation activity. Use the appropriate range of tools and techniques to determine product performance to specification or support gathering fundamental science and technologies.

LEARNING OUTCOMES

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

- Demonstrate an in-depth knowledge in using range of tools and techniques to capture an OME event.
- Demonstrate a critical understanding and knowledge of data, capturing and analysing to determine product performance within OME field.

INDICATIVE CONTENT

- Major categories of qualitative data collection techniques
- How to evaluate and trust qualitative or quantitative data
- Standardisation, normalisation and filtering methods
- Describe recording equipment, oscilloscopes, data loggers, amplifiers, etc.
- Software for statistical analysis and data visualisation
- Evaluate monitoring techniques; blast gauges, high speed cameras, doppler radar, etc
- Time bases, sample rates / bit rates and sampling frequency (Nyquist)
- define the criteria for determining the validity of research
- 3D data scanning for inspection and test, data handling

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
Essay	3,000 words	50%

Assessment Component 2

(Tick one)

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Lab Report	3,000 words equivalent	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6021	
Module Title	Data Capture and Evaluation	
Classification	Reading List entry	Electronic*
Essential	Kinney, G. (1985) <i>Explosive Shocks in Air</i> eISBN 978-3-642-86682-1	☐
Essential	Cooper, P. W. (2013) <i>Explosives Engineering</i> New York : Wiley VCH	☐
Essential	Mader, C. (1998) <i>Numerical Modelling of Explosives and Propellants 3rd ed</i> eISBN 978-1-4200-5239	☐
Essential	Zucas, J. A. and Walters, W. P. (1997) <i>Explosive Effects and Applications</i> New York : Springer - ISBN 978-0-387-955582	☐
Further	Needham, C. E. (2010) <i>Blast Waves</i> eISBN 978-3-642-05288-0	☐
Further	Spiegelhalter, D. (2019) <i>The Art of Statistics: Learning from Data</i> Manhattan : Penguin Random House	☒

Further	Spence, R. (2006) <i>Information Visualization: Design for Interaction</i> New Jersey : Prentice Hall	☐
Further	Loth, A. (2019) <i>Visual Analytics with Tableau</i> , New Jersey : John Wiley	☒
Further	Bourne, N. (2013) <i>Materials in Mechanical Extremes</i> Cambridge : CUP ISBN 978-1-10702375-8	☐
Further	Lillesand, L., Kiefer, R. and Chipman, J. (2015) <i>Remote Sensing and Image Interpretation</i> New Jersey : John Wiley	☐
Further	Persson, P-A., Hilmberg, and Lee, J. <i>Rock Blasting and Explosives Engineering</i> (1993) Boca Raton : CRC Press ISBN 0-8493-8978-X	☐
Further	Suceska, M. (1995) <i>Test Methods for Explosives</i> New York : Springer ISBN 978-1-4612-69045	☐

Module Code	ACDA6022
Title	OME Safety Management and Legislation
Date	17/08/2022
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide a comprehensive and systematic knowledge of explosives safety, legislation and regulations and its impact on OME design.

LEARNING OUTCOMES

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

- Comprehensively interpret and communicate the legal requirements for explosives legislation.
- Critically evaluate key safety and security requirements for the design, manufacture, transport and storage of explosives.

INDICATIVE CONTENT

- Explosives authorisations and licensing
- Building construction and type
- Impact of legislation on OME design
- Separation Distances and structural Justifications
- Safety requirements
- Security provisions
- Storage and transport

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
Case Study/Incident Investigation Report	6,000 words	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDA6022	
Module Title	OME Safety Management and Legislation	
Classification	Reading List entry	Electronic*
Essential	Explosives Regulations 2014 (amendment) Regulations 2016 (ER 2014)	☒
Essential	ER2014 Guidance on Regulations - Safety Requirements L150	☒
Essential	ER2014 Guidance on Regulations - Safety Provisions L150	☒
Further	JSP 333: <i>Services textbook of explosives, Ministry of Defence</i> , 2020	☒
Further	DSA02 – DNSR Defence Nuclear Safety Regulations of the Defence Nuclear Enterprise (May 2021), Ver 1.0	☒
Further	DSA03 – DNSR Defence Nuclear Safety Regulations of the Defence Nuclear Enterprise - Guidance (May 2021), Ver 1.0	☒

Module Code	ACDA6023
Title	End Point Assessment (EPA) for Degree Apprentices
Date	23/09/2024
Level	6
Credits	0 Credits (non-credit bearing, mandatory for completion)
Pre-Requisites	Gateway requirements of the Apprenticeship Standard (England) or Welsh Degree Apprenticeship Framework
DBS Check	May be required ☒ Not required ☐

AIM(S)

- To assess the apprentice's competence in knowledge, skills, and behaviours (KSBs), ensuring they are fully prepared for professional roles through a structured evaluation of their academic and workplace development and as outlined in the appropriate Apprenticeship Standard (England) or the Welsh Degree Apprenticeship Framework.

LEARNING OUTCOMES

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

- demonstrate that they have met the requirements of the relevant end-point assessment criteria for their identified Apprenticeship Standard (England) or Welsh Degree Apprenticeship Framework.

INDICATIVE CONTENT

- The indicative content can be found in the End Point Assessment document relevant to the Apprenticeship Standard (England) or Welsh Degree Apprenticeship Framework.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	0	0%
Independent learning	As per EPA requirements	100%
Placement learning	0	0%
TOTAL	As per EPA requirements	100%

ASSESSMENT

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

Mode of assessment	Volume	Weighting
Detailed assessment criteria as outlined in the End Point Assessment plan of the relevant Apprenticeship Standard (England) or Welsh Degree Apprenticeship Framework	As outlined in the detailed assessment criteria within the specific End Point Assessment plan of the Apprenticeship Standard (England) or Welsh Degree Apprenticeship Framework	100%

Pass/Fail Criteria:

This is a pass/fail module. Apprentices must successfully pass all required components of the EPA to complete their apprenticeship.

Assessment Summary

Activity type	Percentage
As identified in the Apprenticeship Standard	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

It is essential that apprentices completing this module read and become fully conversant with the End Point Assessment criteria outlined in their Apprenticeship Standard or Framework.

Module Code	ACDA6023	
Module Title	End Point Assessment (EPA) for Degree Apprentices	
Classification	Reading List entry	Electronic*
Essential	End-point assessment guide for apprentices - GOV.UK	
Essential	Bradbury, A. and Wynne, V. (2020). <i>The Apprentice's Guide to End Point Assessment</i> . Learning Matters.	
Further	Cottrell, S. (2024). <i>The Study Skills Handbook</i> (6 th ed.). Bloomsbury Academic.	☒
Further	Boud, D., Keogh, R., & Walker, D. (2013). <i>Reflection: Turning Experience into Learning</i> . Routledge.	☐
Further	Serrat, O. (2017). <i>Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance</i> . Springer.	☐

Module Code	ACDB6008
Title	Scientific Principles of OME Design
Date	17/08/2022
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop a systematic understanding of the scientific principles behind the design of OME, their mode of operation and the outcomes to be expected from their correct functioning.

LEARNING OUTCOMES

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

- Apply a systematic understanding of the scientific principles behind OME design.
- Critically analyse and select appropriate OME to produce a given effect.

INDICATIVE CONTENT

- Material properties relevant to shock
- Penetration mechanics
- Formation of EFPs and shaped charge jets.
- Ballistics design
- Designing for blast and fragmentation effects
- Arming, fusing and firing.

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
Report	3,000 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDB6008	
Module Title	Scientific Principles of OME Design	
Classification	Reading List entry	Electronic*
Essential	Akhavan, J. (2011) <i>The Chemistry of Explosives</i> , Cambridge : Royal Society of Chemistry	☒
Essential	JSP 333: <i>Services textbook of explosives</i> , (2020) Ministry of Defence.	☒
Further	Agrawal, J.P. (2010) <i>High Energy Materials</i> , New Jersey : Wiley	☐
Further	Carlucci, D.E. and Jacobson, S.S. (2013) <i>Ballistics: Theory and Design of Guns and Ammunition</i> , Boca Raton, Florida : CRC Press	☐
Further	Klapötke, T.M. (2017) <i>Chemistry of High Energy Materials</i> , Berlin : de Gruyter	☐
Further	Maytas, R. and Pachman, J. (2013) <i>Primary Explosives</i> , New York : Springer	☐
Further	Zukas, J.A. and Walters, W. (2013) <i>Explosive Effects and Applications</i> , New York : Springer	☐

Module Code	ACDB6016
Title	Materials Science
Date	11/07/2023
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To provide the student with an in-depth knowledge of the behaviour of materials in their operating environments, to gain a critical understanding of the principles and potential applications of a range of advanced engineering materials.

LEARNING OUTCOMES

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

- demonstrate analytical knowledge of strain, fracture, fatigue and corrosion mechanisms and phenomena;
- critically evaluate the environmental degradation of both metals and non-metals and suggest methods of protection, demonstrating analytical skills in mechanical failure modes;
- systematically analyse structure-property relationships and behaviours of a range of advanced engineering materials, including potential applications.

INDICATIVE CONTENT

- Stress-strain responses for common engineering materials, plastic yield, strain hardening and flow stress.
- Alloys and structures, micro-mechanisms of fracture, fracture mechanics and fatigue mechanisms.
- Corrosion of ferrous and non-ferrous metals.
- The effects of machining OME materials -
 - Advanced traditional machining.
 - High speed machining.
 - Non-traditional machining.
 - Thermal cutting processes.
 - Abrasion processes.
 - Ultrasonics.
 - Water jetting.
- Coatings and additives.
- Environmental considerations of materials selection.

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
Report	2,500 words	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACDB6016	
Module Title	Materials Science	
Classification	Reading List entry	Electronic*
Essential	Dowling, N. E., Mechanical Behaviour of Materials: Engineering Methods for Deformation, Fracture and Fatigue (Wiley, 2012)	☒
Further	El-Hofy, H., Fundamentals of Machining Processes, Conventional and Nonconventional Processes, 2 nd Edition (CRC Taylor & Francis, 2013)	☒
Further	Roberge, P. R., Corrosion Engineering: Principles and Practice (McGraw Hill, 2008)	☒
Further	Suresh, S., Fatigue of Materials (Cambridge University Press, 1998)	☒
Further	Hosford, W. F. and Cadell, R. M., Metal Forming: Mechanics and Metallurgy (Cambridge University Press, 2014)	☒

Module Code	ADFM6009
Title	Music Video Production
Date	14/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To advance the wide ranging skills established in the production stages of digital audio visual design and construction To develop a portfolio of recorded works, demonstrating practical and theoretical knowledge of software and hardware tools.
- To develop a greater awareness of creative experimentation within the union of sound and vision in the production of a cohesive innovative product

LEARNING OUTCOMES

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

- Demonstrate a highly developed competence in the planning and management of an audio visual production required in the assembly of a creative, contemporary experimental sequence or production.
- Originate a range of appropriate creative digital audio visual elements that combine as a solution to an identified student led experiential challenge.

INDICATIVE CONTENT

- Project and production planning.
- Edit planning.
- Advanced digital audio visual image gathering technology and practice for still and moving image.
- Advanced creative experimental photography and its application to a combined sound and image production.
- Visual components, line, shape, tone, colour, movement and rhythm.
- Compositing techniques in the still and moving image.
- Lighting for effects.
- Advanced lighting for still and moving image, theory and practice.
- Application of audio to the moving image.
- Advanced computer-controlled post-production techniques, non-linear editing techniques, narrative, continuity.
- Compression and destination of the final edit.

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/ word count or equivalent	Weighting
Coursework	Audio Visual Production: Music Video (minimum 3 minutes) The student is required to deliver a Music Video piece demonstrating their independent management and organisation of the production pipeline. Design and develop from concept through production, edit and output experimental sound and vision artefact that defines the originator's intention and objective.	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ADFM6009	
Module Title	Music Video Production	
Classification	Reading List entry	Electronic*
Essential	De Man Brecht (2019) <i>Intelligent Music Production</i> Focal Press	
Essential	Burns L. (2019) <i>The Bloomsbury Handbook of Popular Music Video Analysis</i> Bloomsbury	
Essential	Arnold G. & Cookney D (2017) <i>Music, Video, History Aesthetics in media</i> Bloomsbury publishing	
Essential	Owsinski, B (2010) <i>The Musician's video handbook</i> . Hal Leonard Corp.	☐
Essential	Camara, C (2014) <i>Music Video Ideas</i> . Acachi Press	☒
Essential	Honthaner, E. L. (2010) <i>The Complete Film Production Handbook</i> . Focal	☒
Essential	Owens, J. & Millerson, G. (2012) <i>Television Production</i> . Focal Press.	
Further	Parks, S. (2012) <i>The Insider's Guide to Independent Film Distribution</i> . Focal Press.	☐
Further	Edwards, R. & Skerbelis, M. (2012) <i>The Complete Filmmaker's Guide to Film Festivals</i> . Michael Wiese.	☐
Further	Thurlow, C. & Thurlow, M. (2013) <i>Making Short Films: the Complete Guide From Script to Screen</i> . Bloomsbury Academic.	☐
Further	Kleiler, D & Moses, R. (1998) <i>You Stand There</i> . Three Rivers Press.	☐
Further	Journals American Cinematographer (The ASC, monthly) Screen International (EMAP, weekly) Broadcast (EMAP, weekly) Websites www.screendaily.com www.broadcastnow.com www.theasc.com	☒

Module Code	ADFM6011
Title	Final Portfolio and Showreel
Date	14/09/2020
Level	6
Credits	40
Pre-Requisites	None

AIM(S)

- Employ a theoretical and creatively-applied understanding of the key technical production elements of the chosen specialism.
- Produce a professional Industry-ready portfolio demonstrating expertise and a high level of specialism.

LEARNING OUTCOMES

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

- Conceive and apply a relevant suite of project- and self-management skills.
- Evidence the process-management and pipeline of an individual programme of self-directed learning.
- Critically appraise their own learning and contextualise their methodologies and aesthetic stance with current Industry trends and practices.

STUDY TIME ALLOCATION

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	96	24%
Independent learning	304	76%
Placement learning	0	0
TOTAL	400	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume/ word count or equivalent	Weighting
Coursework	Development portfolio, all project assets (equivalent 3000 words)	20%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume/ word count or equivalent	Weighting
Coursework	Final Viva presentation. 20 minutes plus questions	20%

Assessment Component 3

☒ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume / word count or equivalent	Weighting
Coursework	Professional showreel portfolio	60%

Assessment Summary

Activity type	Percentage
Written	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ADFM6011	
Module Title	Final Portfolio and Showreel	
Classification	Reading List entry	Electronic*
Essential	Hepworth-Sawyer R. (2019) <i>Producing Music: Perspectives on Music Production</i>	
Essential	De Man B. (2019) <i>Intelligent Music Production</i> Focal Press	
Essential	Miller S. (2017) <i>Paved: The Complete Navigated guide to succeed in the Music Industry</i> Rocket Press	
Essential	Bull B. (2016) <i>Take the Bull by the Horns: Seize the moment</i> Finite publishing	
Essential	Wikstrom, P. (2013) <i>The Music Industry: Music in the Cloud</i> , 2 nd Edition. Polity Press.	☒
Essential	Passman, D. (2014) <i>All You Need To Know About The Music Industry</i> : 8 th Edition. Rosetta Books, LLC.	☒

Essential	Fisher, J. P. (2011) <i>Ruthless Self Promotion for the Music Industry</i> , 2 nd Edition	☐
Essential	King, M. (2009) <i>Music Marketing: Press, Promotion, Distribution and Retail</i> . Berklee Press.	☐
Essential	Rogers, J. (2013) <i>The Death and Life of the Music Industry in the Digital Age</i> . Bloomsbury Publishing.	☐
Essential	http://www.ipo.gov.uk/ http://www.aandronline.com/ http://www.thebuzzfactor.com/ http://www.knowthemusicbiz.com/ http://www.prsformusic.com http://www.musicweek.com/ http://www.musiciansunion.org.uk/ http://www.welshmusicfoundation.com/ http://www.own-it.org/ http://www.bized.co.uk http://www.bytestart.co.uk	☒

Module Code	ADFM6011
Title	Final Portfolio and Showreel
Date	14/09/2020
Level	6
Credits	40
Pre-Requisites	None

AIM(S)

- Employ a theoretical and creatively-applied understanding of the key technical production elements of the chosen specialism.
- Produce a professional Industry-ready portfolio demonstrating expertise and a high level of specialism.

LEARNING OUTCOMES

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

- Conceive and apply a relevant suite of project- and self-management skills.
- Evidence the process-management and pipeline of an individual programme of self-directed learning.
- Critically appraise their own learning and contextualise their methodologies and aesthetic stance with current Industry trends and practices.

STUDY TIME ALLOCATION

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	96	24%
Independent learning	304	76%
Placement learning	0	0
TOTAL	400	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume/ word count or equivalent	Weighting
Coursework	Development portfolio, all project assets (equivalent 3000 words)	20%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume/ word count or equivalent	Weighting
Coursework	Final Viva presentation. 20 minutes plus questions	20%

Assessment Component 3

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume / word count or equivalent	Weighting
Coursework	Professional showreel portfolio	60%

Assessment Summary

Activity type	Percentage
Written	
Coursework	100%
Practical	
TOTAL	100%

INDICATIVE READING LIST

Module Code	ADFM6011	
Module Title	Final Portfolio and Showreel	
Classification	Reading List entry	Electronic*
Essential	Hepworth-Sawyer R. (2019) <i>Producing Music: Perspectives on Music Production</i>	
Essential	De Man B. (2019) <i>Intelligent Music Production</i> Focal Press	
Essential	Miller S. (2017) <i>Paved: The Complete Navigated guide to succeed in the Music Industry</i> Rocket Press	
Essential	Bull B. (2016) <i>Take the Bull by the Horns: Seize the moment</i> Finite publishing	
Essential	Wikstrom, P. (2013) <i>The Music Industry: Music in the Cloud</i> , 2 nd Edition. Polity Press.	☒
Essential	Passman, D. (2014) <i>All You Need To Know About The Music Industry</i> : 8 th Edition. Rosetta Books, LLC.	☒
Essential	Fisher, J. P. (2011) <i>Ruthless Self Promotion for the Music Industry</i> , 2 nd Edition	☐
Essential	King, M. (2009) <i>Music Marketing: Press, Promotion, Distribution and Retail</i> . Berklee Press.	☐
Essential	Rogers, J. (2013) <i>The Death and Life of the Music Industry in the Digital Age</i> . Bloomsbury Publishing.	☐
Essential	http://www.ipo.gov.uk/ http://www.aandronline.com/ http://www.thebuzzfactor.com/ http://www.knowthemusicbiz.com/ http://www.prsformusic.com http://www.musicweek.com/	☒

	http://www.musiciansunion.org.uk/ http://www.welshmusicfoundation.com/ http://www.own-it.org/ http://www.bized.co.uk http://www.bytestart.co.uk	
Further	Barker, S.; Cole, R. (2009) Brilliant Project Management (Revised Edition): What The Best Project Managers Know, Do And Say, London: Prentice Hall.	☐

Module Code	ADMA6000
Title	Independent Project
Date	25/06/2020
Level	6
Credits	40
Pre-Requisites	None

AIM(S)

- To develop the ability of students to engage critically and innovatively with theory and/or practice relevant to their studied subject areas in order to produce a discipline specific in-depth project.

LEARNING OUTCOMES

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

- Demonstrate intellectual skills in the identification of an appropriate topic, problem or challenge for investigation pertinent to their field of study and formulate a suitable plan for further research utilising relevant investigative methods in order to produce a response.
- Evidence in-depth knowledge and critical understanding of principles necessary to underpin their education within their chosen field of study and problem solving techniques applicable to this.
- Evidence independence of thought and critical evaluation in the production of an independent piece of work, demonstrating transferable skills through exercising initiative and personal responsibility in planning own learning and self-management.
- Organise their knowledge and learning through use of a range of media, and present their work appropriately in a manner that can be understood by specialist and non-specialist audiences.

INDICATIVE CONTENT

- Research paradigms, methods, and techniques of research and enquiry.
- Conducting and writing literature reviews.
- Ethical concerns and the research process.
- Resource, project, and skills management processes and techniques.
- Presenting and illustrating data and information.
- Communication of general, specialist, technical ideas and results.
- Problem solving, creative, entrepreneurial thinking and approaches.
- Collaboration, adaptability and reflection.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	36	9%
Independent learning	364	91%
Placement learning		
TOTAL	400	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Portfolio	Minimum of 3 elements (equivalent to 10,000 words)	100%

Assessment Summary

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

INDICATIVE READING LIST

This will be guided by the student's individual project.

Module Code	ADMA6000	
Module Title	Independent Project	
Classification	Reading List entry	Electronic*
Essential	Cottrell S, (2015) <i>Skills for Success Personal Development and Employability</i> , 3 rd edition, Palgrave. London.	☒
Essential	ASET, 2013 <i>Good Practice Guide for Workbased Learning and Placement Learning in Higher Education</i>	☒
Essential	Gray, D.E. (2018) <i>Doing Real World Research</i> , London: SAGE.	☐
Further	Gallagher K, (2016) <i>Essential Study and Employment Skills For Business and Management Students</i> , Oxford	☐
Further	Gottschall, Jonathan (2013), <i>The Storytelling Animal: How Stories Make Us Human</i> , Houghton Mifflin	☐

Further	Storr, Will (2020), <i>The Science of Storytelling</i> , William Collins	☐
Further	Cohen, L. Manion, L. and Morrison, K. (2017) <i>Research Methods in Education</i> , 8 th edition London: Routledge.	☒
Further	Flick, U. (2014) <i>An Introduction to Qualitative Research</i> , London: SAGE.	☐
Further	Aubrey, K. & Riley, A. (2017) <i>Understanding and Using Challenging Education Theories</i> , London: SAGE.	☒
Further	Brinkmann, S. and Kvale, S. (2018) <i>Doing Interviews (Qualitative Research Kit)</i> . Sage	☐
Further	Gibbs, G. (2018) <i>Analysing Qualitative Data (Qualitative Research Kit)</i> . Sage	☒
Further	Creswell, J. W. (2012). <i>Qualitative inquiry and research design: Choosing among five approaches</i> . Sage	☐
Further	Obschonka, M., Hakkarainen, K., Lonka, K. et al. Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood. <i>Small Bus Econ</i> 48 , 487–501 (2017). https://doi.org/10.1007/s11187-016-9798-6	☒
Further	https://ec.europa.eu/jrc/en/entrecomp	☒

Module Code	ADMA6010
Title	Mastering and Production
Date	14/09/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- Investigate current industry practices in the dissemination of recorded music through exploring production tools, formats and distribution channels to enable the creation of contemporary produced content.
- Create professional finalised content in collaboration with external parties, e.g. presenters, actors or musicians.

LEARNING OUTCOMES

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

- Critically engage with current standards, practices and technologies.
- Demonstrate creative skills and expertise through analysis of current media and the planning and generation of original content.

INDICATIVE CONTENT

- Analysis of popular and current production and streaming techniques
- Studio Production
- Final Chain Mastering
- Aggregation and distribution
- Sound and Recoding Production - recording audio for a range of productions, e.g. music performance, music recordings, radio play or interviews, vox pop, on location, podcasts, live stream, etc.
- Broadcast
- Streaming and Production
- Mixing and mastering using industry standard protocols
- Production services for clients

- Project and Production Planning

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/ word count or equivalent	Weighting
Coursework	Production of 30-minute audio content.	100%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ADMA6010	
Module Title	Mastering and Production	
Classification	Reading List Entry	Electronic*
Essential	Braddock, J., (2020) <i>Mastering in Music: Perspectives on Music Production</i>	☐
Essential	Rogers, J. (2021) <i>Audio Mastering Secrets: The Pros Don't Want You To Know!: 1 (Music Production Secrets - Audio Engineering, Home Recording Studio, Song Mixing, and Music Business Advice)</i>	☐
Essential	Game Changers: Radio: Insights and lessons from the world's best radio broadcasters and programmers, Craig Bruce Bad Producer Productions (10 Oct. 2019)	☐
Essential	Radio Production: A Manual for Broadcasters by Robert McLeish and Jeff Link, Focal Press; 4 edition (17 Aug. 1999)	☒

Essential	Essential Radio Skills: How to Present and Produce a Radio Show (Professional Media Practice), Peter Stewart, Bloomsbury 3PL (26 Oct. 2006)	☒
Essential	Radio Secrets: An insider's guide to presenting and producing powerful content for broadcast and podcast, David Lloyd Rethink Press (11 July 2019)	☐