

MODULE DIRECTORY

LEVEL 5

SCHOOL OF APPLIED COMPUTING

FACULTY OF ARCHITECTURE COMPUTING AND ENGINEERING

2018-2019

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INTRODUCTION

This Module Directory includes all the modules for Level 5 within the School of Applied Computing in the academic year 2018-2019.

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 Director (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: ACCA5011
TITLE: Advanced Software Development
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I310

AIM(S)

To provide student with a conceptual understanding of abstract data types, data structures and algorithms used in computer science and software engineering and the ability to apply these concepts using object oriented (OO) development methods.

LEARNING OUTCOMES

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

1. Critically evaluate the suitability of selected algorithms and data structures to solve given problems.
2. Design and develop OO applications to solve a given problem scenario.

INDICATIVE CONTENT

- Abstract data types (ADT).
- Simple data structures: stacks, queues.
- Static and dynamic memory allocation for implementing data structures.
- Files and record structures.
- Containers and iterators.
- Lists, linked lists, heaps, trees, binary trees, graphs.
- sorting and searching algorithms.
- Hashing: open addressing, chaining.
- Complexity considerations.
- Concepts of object orientation including objects, classes, encapsulation composition, inheritance, delegation, polymorphism.
- Object oriented design methods.
- UML.
- Software frameworks, SDK, API programming.
- Object oriented programming.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Practical in class test	2 hours	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment	2000 words	50%

Assessment Summary

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

READING LIST

Module Code	ACCA5011	
Module Title	Advanced Software Development	
Classification	Reading List entry	Electronic*
Essential	Cormen,T.H. (2009) Introduction to Algorithms, MIT Press	☐
Further	Sedgewick (2011) Algorithms 4 th edition, Addison-Wesley	☒
Essential	Meyers.S (2014) Effective Modern C++, O'Reilly Media	☒
Further	Stroustrup,B (2014) Programming: Principles and Practice Using C++	☒
Further	Gonnet, G. and Baeza-Yates, R., (1991) <i>Handbook of Algorithms and Data Structures</i> , Addison-Wesley	☐

MODULE CODE: ACCA5012
TITLE: Application Development
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I310

AIM(S)

- To provide students with a systematic understanding of the concepts underlying the implementation of interactive web, games, desktop or mobile experiences.

LEARNING OUTCOMES

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

1. Evaluate the concepts, principles and technologies and techniques used in the development and creation of interactive experiences
2. Select and deploy appropriate scripting and programming languages and techniques in the implementation of applications for real-world problem scenarios.

INDICATIVE CONTENT

- Modern scripting tools and programming languages for designing and creating interactive applications and user interface systems.
- Software development libraries, frameworks and design patterns for application development e.g. design patterns to support separation of concerns.
- Data access, management and manipulation techniques, options for preserving data and dynamic content.
- Responsive and interactive user interfaces and experiences.
- Testing, debugging and evaluation, optimisation and performance.

LEARNING AND TEACHING STRATEGY

Essential concepts and principles will be delivered formally in tutorials supported by concurrent practical laboratory exercises, which will allow students to deploy appropriate theory, practices and tools. Tutorials will be punctuated with examples designed to underpin the ideas and techniques introduced, reducing the conceptual leap from theory to practice.

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Coursework: implementation with appropriate supporting documentation	2,500 words or equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Coursework: implementation with appropriate supporting documentation	2,500 words or equivalent	50%

Assessment Summary

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

READING LIST

Module Code	ACCA5012	
Module Title	Application Development	
Classification	Reading List entry	Electronic*
Essential	Preec, J., Sharp, H., Rogers, Y., 2015, <i>Interaction Design: Beyond Human-Computer Interaction</i> 4th Edition, Wiley	☒
Essential	Krug, S., 2014, <i>Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability</i> (3rd Edition) (Voices That Matter), New Riders	☒
Further	Coleman, B., Goodwin, D., 2017, <i>Designing UX: Prototyping: Because Modern Design is Never Static</i> 1st Edition, SitePoint	☒
Further	Japiske, P, Grossnicklaus, K., Dewy, B., 2017, <i>Building Web Applications with Visual Studio</i> 2017	☒
Further	Chambers, J., Paquette D., Timms, S., 2016, <i>ASP.NET Core Application Development</i> , Microsoft Press	☒
Further	Adams, E., 2013, <i>Fundamentals of Game Design</i> , 3rd Edition, New Riders	☒
Further	Hocking, J., 2018, <i>Unity in Action: Multiplatform game development in C#</i> 2nd Edition, Manning	☒
Further	Leung, T., 2017, <i>Beginning PowerApps: The Non-</i>	☒

	Developers Guide to Building Business Mobile Applications, Apress	
Further	Pratt, P., J., Last, M. Z., Shelly Cashman Series Microsoft Office 365 & Access 2016: Comprehensive (MindTap Course List) 1st Edition, Course Technology	☒

MODULE CODE: ACCA5013
TITLE: Business & Web Management
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I310

AIM(S)

- To enable the student to gain a broad understanding of Business & IT Management concepts, techniques and methods used within Organisations today including the role of the contemporary manager in the realisation of individual and Organisational potential through stakeholder relationships.
- To develop the student's conceptual understanding and practical skills in using up-to-date Technologies to meet business needs including areas such as Information Systems, Online Marketing and e-Commerce.

LEARNING OUTCOMES

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

1. Demonstrate a sound understanding of the principal forms of Business strategy & the environment, Leadership & Management, Motivation and Business information systems.
2. Understand and apply essential concepts techniques and applications required to design and create a Professional Online presence for a business.

INDICATIVE CONTENT

- Strategy.
- Business environment.
- Business functions.
- Leadership & management.
- Structure & culture.
- Motivation.
- Business Information Systems.
- Cloud Computing concepts.
- Web design & online branding.
- Web Usability Guidelines and Accessibility principles.
- Online Marketing & Analytics.
- E-Commerce solutions.
- Professional legal and ethical issues: security, privacy, usability, accessibility.

LEARNING AND TEACHING STRATEGY

The allocation of teaching to deliver the module is:

Activity type	Hours	Percentage
Scheduled learning	60	30%
Independent learning	140	70%
Placement learning		
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
Presentation	15 minutes	50%

Assessment Summary

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

READING LIST

Module Code	ACCA5013	
Module Title	Business & Web Management	
Classification	Reading List entry	Electronic*
Essential	Mullins, L. J. (2016) (11 th Ed.) Management & Organisational Behaviour. Pearson.	☒
Essential	Chaffey, D. & Smith, P. R. (2017) (5th Ed.) Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing. Routledge.	☒
Further	Chaffey, D. (2014) (6 th Ed.) Digital Business and E-Commerce Management, Pearson.	☒
Further	Piccoli, G. & Pigni, F. (2016) (3 rd Ed.) Information Systems for Managers: Text and Cases. Hoboken. Prospect Press.	☒
Further	Daconta, Michael C. (2013) Great Cloud Migration: Your Roadmap to Cloud Computing, Big Data and Linked Data. Outskirts Press.	☒

Further	Kingsnorth, S. (2016) Digital Marketing Strategy: An Integrated Approach to Online Marketing. Kogan Page.	☐
Further	Damian, R. & Jones, C (2016) (4th Ed.) Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation. Kogan Page.	☐
Further	Sklar, J. (2014) (6th Ed.) Principles of Web Design. Course Technology.	☐
Further	Krug, S. (2013) (3rd Ed.) Don't Make Me Think: A Common Sense Approach to Web Usability. New Riders.	☐
Further	Sharma, A (2016) The Google Checklist: Marketing Edition, CreateSpace.	☐
Further	http://businesscasestudies.co.uk	☒
Further	http://www.cbi.org.uk/	☒
Further	http://www.informationweek.com	☒
Further	http://www.forbes.com/technology/	☒
Further	Journal of Management Studies	☒
Further	Journal of Organisational Behaviour	☒
Further	Management Today	☒
Further	Harvard Business Review	☒
Further	Information Systems Journal	☒
Further	Information Systems Management	☒
Further	http://www.useit.com/	☒
Further	http://marketingland.com	☒
Further	http://www.digitaltrends.com/social-media/	☒
Further	http://www.ecommercetimes.com	☒
Further	ACM Transactions on Internet Technology.	☒
Further	International Journal of Online Marketing (IJOM).	☒
Further	Journal of Digital & Social Media Marketing.	☒
Further	International Journal of Electronic Commerce.	☒

MODULE CODE: ACCA5014
TITLE: Database Management Systems
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I320

AIM(S)

To provide the student with the essential concepts involved in the design, implementation, and testing of multi-user database applications. It will also expose students to some of the more advanced concepts that underpin multi-user access and more sophisticated database applications.

LEARNING OUTCOMES

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

1. Apply well-established data analysis and design techniques to produce requirements and specifications for a database application showing a requisite understanding of the need for quality and data security.
2. Demonstrate a sound understanding of the knowledge and skills required to design, implement and manage multi-user database applications.

INDICATIVE CONTENT

- Data analysis and database design, e.g. entity relationship modelling, normalisation.
- Structured Query Language: data definition, data manipulation and data control languages.
- Triggers.
- Security measures to typically include: database security threats and counter measures, views, authorisation, backup and recovery, roles, constraints, and encryption.
- Multi-user concepts to typically include: transactions and transaction management, concurrency control, granting and revoking privileges, two phase commit, lost updates and inconsistent analysis.
- Object relational concepts to typically include: object creation, object querying and inheritance.

LEARNING AND TEACHING STRATEGY

Essentially this module will have a vocational focus that will give the students an appreciation of the theoretical concepts and principles for the design, development, security and quality assurance of multi-user database systems. The theoretical material will be delivered formally in lectures. Tutorials will be used to support the theory with practical laboratory based exercises to provide practical hands-on experience.

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	60	30%
Independent learning	140	70%
Placement learning	0	
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
Essay	2000 words	50%

Assessment Summary

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

READING LIST

Module Code	ACCA5014	
Module Title	Database Management Systems	
Classification	Reading List entry	Electronic*
Essential	Connolly, T., Begg, C., (2014), <i>Database Systems: A Practical Approach to Design, Implementation and Management</i> , Addison Wesley	☒
Essential	Hernandez, M., (2013), <i>Database Design for Mere Mortals: A Hands-on Guide to Relational Database Design 3rd Edition</i> , Addison Wesley	☒
Further	Silberschatz, A., Korth, H., Sudarshan, S., (2010), <i>Database Systems Concepts 6th Edition</i> , McGraw Hill	☐
Further	Elmasri, R., Navathe, S., (2013), <i>Fundamentals of Database Systems</i> , Pearson	☐
Further	Greenwald, R., Stackowiak, R., Stern, J., (2013) <i>Oracle Essentials: Oracle Database 12c</i> , O'Reilly	☐
Further	Faroult, S., (2013), <i>SQL Success: Database Programming Proficiency</i> , Roughsea	☐
Further	Rankins, R., Bertucci, P., Gallelli, C., Silverstein, A., (2013), <i>Microsoft SQL Server 2012 Unleashed</i> , Sams	☐
Further	http://www.oracle.com/technetwork/developer-	☒

	tools/sql-developer/overview/index.html	
Further	http://docs.oracle.com	☒
Further	w3Schools.com/sql	☒
Further	msdn.microsoft.com	☒
Further	http://www.tutorialized.com/tutorials/MsSQL/1	☒

MODULE CODE: ACCA5016
TITLE: Governance, Legislation and Ethics Work Based Project
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I100

AIM(S)

- To develop in students a systematic understanding of issues relevant to workplace requirements for governance, legislation and ethics.

LEARNING OUTCOMES

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

1. Apply independent research techniques and information to analyse workplace related issues relevant to governance, legislation and ethics
2. Demonstrate a sound understanding of governance, legislation and ethics as applied to a workplace.

INDICATIVE CONTENT

Students will undertake a research project related to their specific place of work, or a place of work, that should reference the following areas:

Governance and data management

- Information Governance
- Legal issues

Confidentiality and Data Protection in a specified industrial sector

- Common Law – tort, contract, other
- Criminal Law
- GDPR role definitions
- Principles under GDPR
- Data Security
- Data storage and implications
- Risk Management
- Data Breach Management
- Breaches – criminal and civil sanctions

Freedom of Information and Records Management

- Freedom of information Act
- Environmental Information Regulations
- Reuse of Public Sector Information Regulations
- The Open Government Licence
- Records Management – FOI / Public Records Act
- Data Protection and records management / FOI CoP cross-over Ethics

- Nolan Committee on Standards in Public Life
- Corporate ethics
- Using patient data in research
- Ethics, the Internet and Social Media

LEARNING AND TEACHING STRATEGY

The allocation of teaching to deliver the module is:

Activity type	Hours	Percentage
Scheduled learning	4	2%
Independent learning	140	70%
Placement learning	56	28%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	4500 words	100%

Assessment Summary

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

READING LIST

Module Code	ACCA5016	
Module Title	Governance, Legislation and Ethics Work Based Project	
Classification	Reading List entry	Electronic*
Essential	John Ladley, Data Governance: How to Design, Deploy and Sustain an Effective Data Governance Program, Morgan Kaufmann, MA, USA, 2012	☒
Essential	David Plotkin, Data Stewardship: An Actionable Guide to Effective Data Management and Data Governance, Morgan Kaufmann, MA, USA, 2013	☒
Further	Quinn, M. J., Ethics for the Information Age: International Edition, Pearson: NY, 2015	☒
Further	Websites (all web references accessed 1500, 22/03/2017) Introduction to concepts: The Data Governance Institute http://www.datagovernance.com/ Current topics in IG: NHS Wales Information Governance Weekly eAlert (via Moodle)	☒

MODULE CODE: ACCA5017
TITLE: Games Architecture and Mechanics
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I100

AIM(S)

To achieve a systematic understanding of core games software, tools and concepts used in games and physics engines.

LEARNING OUTCOMES

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

1. Demonstrate a sound understanding of the architecture of games and physics engine components necessary for the development of games software.
2. Deploy appropriate languages, tools and techniques in the development of games and game physics applications.

INDICATIVE CONTENT

- Games programming principles and techniques.
- Application and use of software libraries, SDKs and APIs used in Games programming.
- Application of specified programming language (C/C++).
- Cross platform development for game development QT, SDL2, etc.
- Games programming design patterns.
- Importing game resources e.g. graphics, textures, audio, 3D models, etc.
- Programming concepts and techniques used in the development of common game development applications and tools e.g. game level and terrain editors.
- Physics Engine architecture.
- Mechanics.
- Bounding Volumes.
- Collision Detection.
- Collision Response.
- Numerical Integration and updates.
- Physics Engine APIs and libraries, eg Bullet, PhysX, etc.

LEARNING AND TEACHING STRATEGY

Essential concepts and principles will be delivered formally in tutorials supported by concurrent practical laboratory exercises, which will allow students to deploy appropriated theory, practices and tools. Seminars will be punctuated with examples designed to underpin the idea and techniques introduced, reducing the conceptual leap from theory to practice.

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Implementation + essay	5000-word equivalent	100%

Assessment Summary

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

READING LIST

Module Code	ACCA5017	
Module Title	Games Architecture and Mechanics	
Classification	Reading List entry	Electronic*
Essential	Millington, I. (2010) Game Physics Engine Development 2 nd Edition, CRC Press	☒
Essential	Van Verth, J.M, Bishop, L.M (2015) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann	☒
Essential	Nystrom, R (2014) Games Programming Patterns, Genever Benning	☒
Further	Ericson, C (2004) Real-Time Collision Detection, CRC Press	☒
Further	Hearn, D and Baker, P.M (2010) Computer Graphics with OpenGL, Prentice Hall	☐
Further	Lengyel, E (2011) Mathematics for 3D Game Programming and Computer Graphics 3 rd Edition, Cengage Learning	☐
Further	Dave Shreiner, D, et al (2016) OpenGL Programming Guide, 9th Edition, Addison-Wesley	☐

MODULE CODE: ACCA5018
TITLE: Graphics & Games Programming
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I610

AIM(S)

To achieve a requisite 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:

1. Develop 3D graphics applications using industry standard development tools and application programming interfaces (APIs).
2. Select, analyse and evaluate appropriate graphical methods and techniques to solve given problem specifications.

INDICATIVE CONTENT

- Development tools.
- Graphics platform APIs e.g. DirectX, OpenGL.
- Application of suitable programming languages (C/ C++).
- Graphics hardware/terminology.
- Hardware acceleration and the graphics pipeline.
- Solid modelling methods, tessellation, vertices, graphics primitives and geometry.
- Transformations, object, world and camera spaces.
- Projections, perspective.
- Clipping and hidden surface removal.
- Lighting and shading models.
- Textures, bump mapping and realistic rendering methods.
- Sprites, bill boarding.
- Animation and Scene management.
- Importing animations and tools.

LEARNING AND TEACHING STRATEGY

Essential concepts and principles will be delivered formally in tutorials supported by concurrent practical laboratory exercises, which will allow students to deploy appropriated theory, practices and tools. Seminars will be punctuated with examples designed to underpin the idea and techniques introduced, reducing the conceptual leap from theory to practice.

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam
 ☒ Coursework
 ☐ Practical

Mode of assessment	Volume	Weighting
Implementation + essay	5000 words	100%

Assessment Summary

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

READING LIST

Module Code	ACCA5018	
Module Title	Graphics & Games Programming	
Classification	Reading List entry	Electronic*
Essential	Van Verth, J.M, Bishop, L.M (2015) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann	☒
Further	Hearn, D and Baker, P.M (2010) Computer Graphics with OpenGL, Prentice Hall	☐
Further	Dave Shreiner,D, et al (2016) OpenGL Programming Guide, 9th Edition, Addison-Wesley	☐
Further	Foley, VanDam, Feiner, Hughes (1991), Computer Graphics: Principles and Practice 2nd edition, Addison Wesley	☐
Further	Watt, Alan (1998) 3D Computer Graphics 2 nd Edition, Addison Wesley	☐
Further	Hill, F.S. and Kelley, S. M, (2015) Computer Graphics using OpenGL, 3rd Edition, Prentice Hall International Inc.	☐

MODULE CODE: ACCA5021
TITLE: Statistical Programming
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I320

AIM(S)

- To develop the knowledge and skills required to perform more advanced statistical analysis of experimental and informatics data.
- To develop the knowledge and skills required to perform basic statistical programming in an appropriate programming language.

LEARNING OUTCOMES

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

1. Select and apply appropriate statistical methods for the analysis of experimental data
2. Manipulate data and implement statistical programming techniques on large datasets
3. Select and apply appropriate visualisation methods for the presentation of analytical data
4. Perform data exploration using appropriate visualisation tools.

INDICATIVE CONTENT

- Data input and output in multiple formats, including graphical plots.
- Scripts and functions.
- Performing basic statistical analyses including correlation analysis and statistical tests.
- Building packages with suitable documentation and examples.
- Data preparation for import into analysis and visualisation tools.
- Interactive data exploration.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
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	0%
Coursework	100%
Practical	0%
TOTAL	100%

READING LIST

Module Code	ACCA5021	
Module Title	Statistical Programming	
Classification	Reading List entry	Electronic*
Essential	Matloff, N (2013) <i>The Art of R Programming</i> , No Starch Press	☒
Essential	Kranzler, J.H. (2010) <i>Statistics for the Terrified</i> , Pearson	☒
Further	Cotton, R (2013) <i>Learning R</i> , O'Reilly	☒
Further	Alvaro, F (2016) <i>R: Easy R Programming for Beginners</i> , Pearson	☒
Further	Spiegel, M.R (2014) <i>Shaum's Outline of Statistics, fifth ed.</i> , McGraw Hill Education Limited	☒
Further	Gonick, L & Smith, W. (2000) <i>Cartoon Guide to Statistics</i> , William Morrow Paperbacks	☒

MODULE CODE: ACCA5022
TITLE: Web Technologies
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I320

AIM(S)

- To provide students with a systematic understanding of web development using client- and server-side programming languages.

LEARNING OUTCOMES

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

1. Evaluate the concepts, principles, technologies and techniques used in the development of web applications.
2. Design and implement web applications using client- and server-side programming language(s) to resolve a range of web-based problem scenarios.

INDICATIVE CONTENT

- Client-side scripting languages eg Javascript
- Server-side programming languages eg PHP
- Syntax, semantics, constructs including data types, variables, operators, arrays, lists etc.
- Web-based database programming techniques providing typical CRUD functionality
- Implementing dynamic database relationships
- Use of web-based data for different audiences eg mobile applications
- Reading and validating data from web forms eg cleaning data, string processing
- Handling stateless HTTP eg cookies, sessions
- Dynamic content eg time-driven events
- DOM

LEARNING AND TEACHING STRATEGY

Essential concepts and principles will be delivered formally in tutorials supported by concurrent practical laboratory exercises, which will allow students to deploy appropriate theory, practices and tools. Tutorials will be punctuated with examples designed to underpin the ideas and techniques introduced, reducing the conceptual leap from theory to practice.

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Implementation with supporting documentation	2,500 words or equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Implementation with supporting documentation	2,500 words or equivalent	50%

Assessment Summary

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

READING LIST

Module Code	ACCA5022	
Module Title	Web Technologies	
Classification	Reading List entry	Electronic*
Essential	Nixon, R. (2016) <i>Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5</i> , 4 th Edition, O'Reilly Media	☒
Further	Welling, L. (2016) <i>PHP and MySQL Web Development</i> , 5th Edition, Addison Wesley	☒
Further	Clark-Salt, J. (2012) <i>SQL Injection Attacks and Defense</i> , 2nd Edition, Syngress	☒
Further	DuBois, P. (2013) <i>MySQL</i> , 5th Edition, Addison Wesley	☒

MODULE CODE: ACCB5000
TITLE: Computer Forensics
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I111

AIM(S)

To provide students with computer forensics concepts and understanding for the need of computer forensics. Students will learn best practices for general incidence response. The module will then focus on the tools and techniques to perform a full computer forensic investigation.

LEARNING OUTCOMES

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

1. Use their knowledge, of the fundamentals of computer forensics, to evaluate and formulate a range of problems and solutions with respect to the relationship between IT and forensics.
2. Communicate accurately and reliably the legal aspects of forensics and the best practices for incidence response.

INDICATIVE CONTENT

- Introduction to Computer Forensics.
- Computer Forensics Investigation Process.
- Searching and Seizing Computers.
- Presenting Digital Evidence.
- First Responder Procedures.
- Understanding Hard Disks and File Systems.
- Data Acquisition and Duplication.
- Recovering Deleted Files and Deleted Partitions.
- Forensics Investigation using CAINE Live DVD.
- Forensics Investigation Using AccessData FTK.
- Network Forensics Investigation using Wireshark.
- Steganography and Image File Forensics.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1 – Coursework

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Essay	4000 words	100%

Assessment Summary

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

READING LIST

Module Code	ACCB5000	
Module Title	Computer Forensics	
Classification	Reading List entry	Electronic *
Essential	The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics. Author: John Sammons.	☐
Essential	Digital Evidence and Computer Crime: Forensic Science, Computers, and the Internet. Author: Eoghan Casey.	☐
Essential	Digital Forensics with Open Source Tools. Authors: Cory Altheide and Harlan Carvey	☐
Essential	X-Ways Forensics Practitioner's Guide: Authors: Brett Shavers and Eric Zimmerman.	☐
Further	Incident Response and Computer Forensics, Second Edition. Authors: Chris Prosis, Kevin Mandia, and Matt Pepe.	☐
Further	Incident Response: Computer Forensics Toolkit. Author: Douglas Schweizer.	☐
Further	Forensic Computing: A Practitioner's Guide, Second edition. Authors: Tony Sammes and Brian Jenkinson.	☐
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.tandf.co.uk/15567281 www.cftt.nist.gov http://www.jdfsl.org/ CERIAS Forensics Research (http://www.cerias.purdue.edu/research/forensics/) DoD Cyber Crime Center (http://www.dc3.mil) http://www.digitalforensicsmagazine.com/ http://nij.ncjrs.org/publications/pubs_db.asp	☒

MODULE CODE: ACCB5002
TITLE: Routing and Switching Concepts
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I120

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:

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

INDICATIVE CONTENT

- Routing concepts.
- Classless and classful routing.
- Static and default routing.
- Dynamic routing – Distance vector and link-state routing protocols.
- Routing Information protocol (RIP) version 1 and 2.
- Switched networks and hierarchical networks.
- Switch configuration.
- Virtual local area networks (VLAN).
- Inter-VLAN routing using routers and L3 switch.
- LAN redundancy and link aggregation.
- DHCP and NAT.
- LAN security.

LEARNING AND TEACHING STRATEGY

Most of factual material will be presented in lectures using handouts, guided reading and use of internet and intranet material as required. Laboratories will be used to allow students to gain hands on experience on basic configurations of routers and switches with the aid of lab equipment and appropriate software such as Cisco Packet tracer.

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	60	30
Independent learning	140	70
Placement learning		
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
In-class practical	2 hours	50%

Assessment Summary

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

READING LIST

Module Code	ACCB5002	
Module Title	Routing and Switching Concepts	
Classification	Reading List entry	Electronic*
Essential	Routing and Switching Essentials v6 Companion Guide by Cisco Networking Academy, Cisco Press. Published Dec 7, 2016	☒
Essential	Scaling Networks v6 Companion Guide by Cisco Networking Academy, Cisco Press. Published Aug 3 2017	☒
Further	http://www.netacad.com (username and password required)	☒

MODULE CODE: ACCB5004
TITLE: Wireless Networks & Simulation
DATED: 22/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I120

AIM(S)

- To develop an understanding and knowledge of wireless networks and standards and to use simulation tools to analyse these networks, standards, protocols and data traffic and to ensure that students can apply obtained knowledge and effectively use relevant tools.

LEARNING OUTCOMES

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

1. Demonstrate sound understanding and analyse the basic technologies needed to design and implement a wireless network.
2. Understand the role, concepts and principles of computer network simulations needed to design and implement a real-world scenario.
3. Create simulation models and configure protocol, test and critically analyse network scenarios to meet real world requirements using simulation tools.

INDICATIVE CONTENT

- Wireless Networking technologies: IEEE802.11a,b,g,e etc
- WLANs – Wireless Mesh Networks (WMNs), Wireless Sensor Networks (WSNs), Mobile Ad hoc Networks (MANet) etc.
- Wireless design and topologies
- Wireless hardware including client adapters, access points, bridges and antennas
- Wireless LAN Standard – Protocol architecture, architecture and services, MAC, Physical layer
- Introduction to Simulation and Modelling of networks
- Basic Concepts and Techniques – Why simulation is important, what is a model, modelling and system terminology
- Performance evaluation techniques – types of simulation techniques
- Development of Systems simulations – overview of a modelling, project life, classifying life cycle process, describing a process
- Simulation modelling – performance measures, system parameters, the event
- Simulation execution – output analysis
- The traffic generator
- USING Network Simulation software such as NetSim, Riverbed Modeler, Simulink, Qualnet, NS3 etc:
 - o A network simulation package
 - o Modelling network traffic
 - o The project editor
 - o Discrete event simulation (DES)
 - o Node and process modelling
 - o Custom device modelling project

- o Wireless modelling
- o Simulation kernels

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Essay	2000 words	50%

Assessment Summary

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

READING LIST

Module Code	ACCB5004	
Module Title	Wireless Networks & Simulation	
Classification	Reading List entry	Electronic*
Essential	Stallings, W (2014) <i>Wireless Communications and Networks</i> , Pearson New International Education	☒
Further	Mohsen Guizani, Ammar Rayes, Bilal Khan, Ala Al-Fuqaha (2010) <i>Network Modelling and Simulation a Practical Perspective</i> , John Wiley and Sons Ltd,	☐
Further	William H Tranter, L Sam Shanmugam, Theodore S	☐

	Rappaport, Kurt L Kosbar (2004) Principles of Communication Systems Simulation with Wireless Applications, Prentice Hall, USA.	
Further	Tannebaum, A, Wethall David (2014) <i>Computer Networks, fifth ed.</i> , Pearson Education Limited	☐
Further	Gast, Matthew (2013) 802.11 <i>Wireless Networks the Definitive Guide</i> , O'Reilly Media, Inc, 2013	☐
Further	Safiullah Khan, Al-Sakib Pathan, and Nabil Ali Alrajeh (2012) <i>Wireless Sensor Networks, current status and future trends</i> , CRC press, Taylor and Francis Group	☐
Further	Mathley, S, <i>Essentials of Wireless Mesh Networking</i> , Cambridge University Press, 2009	☐
Further	Michel C. Jeruchim, Philip Balaban, K. Sam Shanmugan (2012) <i>Simulation of Communication Systems Second Edition, Modelling, Methodology, and techniques</i> , Klumer Academic Publishers	☐
Further	Jerry Banks, John S Carson II, Barry L Nelson, David M Nicol (2014) Discrete-Event System Simulation, 5 th Ed, Pearson Education Ltd, UK	☐
Further	Websites WilliamStallings.com/Wireless/wireless2e.html WilliamStallings.com/StudentSupport.html Comp.std.wireless	☒

MODULE CODE: ACDA5003
TITLE: Enterprise & Innovation Group Project
DATED: 16/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I310

AIM(S)

The module develops the student's innovation entrepreneurship and employability skills by enabling them to work in teams to apply and develop their skills and knowledge to create an innovative prototype, new product business plan and professional pitch presentation.

LEARNING OUTCOMES

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

1. Demonstrate a sound understanding of enterprise & innovation concepts by evaluating and documenting a vital contribution to an innovative business opportunity.
2. Work as part of a team to design and implement a practical solution and pitch a new business initiative.

INDICATIVE CONTENT

- Creativity & Innovation
- Market research and analysis
- New product design and specification
- Cost analysis, prediction and pricing
- Project planning skills
- Prototype development methods
- New product / Business planning
- Business Types and Strategy
- Marketing
- Financial planning and management
- Operation and production planning
- Professional legal and ethical considerations
- Report writing & Presentation skills
- Organisation and self-motivation skills
- Team working skills
- Use of relevant hardware and software tools.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Interim Presentation	10 minutes	20%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	1500 words	40%

Assessment Component 3

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Final Presentation	15 minutes	40%

Assessment Summary

Activity type	Percentage
Written exam	0
Coursework	40%
Practical	60%
TOTAL	100%

READING LIST

Module Code	ACDA5003	
Module Title	Enterprise & Innovation Group Project	
Classification	Reading List entry	Electronic*
Essential	McKeown, M. (2014) The Innovation Book: How to Manage Ideas and Execution for Outstanding Results (The X Book), FT Publishing International.	☒
Essential	Williams, S (2016) (30th Ed.), The FT Guide to Business Start Up 2017/18: The Most Comprehensive Guide for Entrepreneurs, FT Publishing International.	☒
Further	Barringer, B. R. (2015) (4th Ed.), Entrepreneurship, Pearson.	☐
Further	Ries, E. (2011) The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, Portfolio Penguin.	☐

Further	Kerzner, H, (2017) Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley.	☐
Further	Brechner, E (2015) Agile Project Management with Kanban, Microsoft Press.	☐
Further	Haber, J. (2016) The Business of Good: Social Entrepreneurship and the New Bottom Line, Entrepreneur Press.	☐
Further	Gelobter, M (2015) Lean Startups for Social Change: The Revolutionary Path to Big Impact, EDS Publications Ltd.	☐
Further	Curedale, R (2016) (3rd Ed.), Design Thinking Process and Methods, Design College Inc.	☐
Further	Lewrick, M et. Al. (2018) The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems, John Wiley & Sons.	☐
Further	Horowitz, P. & Hill, W, (2015) The Art of Electronics, Cambridge University Press.	☒
Further	Scherz, P &, Monk, S, (2016) Practical Electronics for Inventors, Mc Graw Hill.	☒
Further	Cowan, A. (2012) Starting a Tech Business: A Practical Guide for Anyone Creating or Designing Applications or Software, John Wiley & Sons.	☐
Further	Waite, R (2015) Online Business Startup: The entrepreneur's guide to launching a fast, lean and profitable online venture, Rethink Press Limited.	☐
Further	Elektor magazine	☐
Further	Electronics World Magazine	☐
Further	Websites: www.entrepreneur.com www.entrepreneurship.org www.isbe.org.uk www.jsbe.com www.ft.com/management/entrepreneurship www.bytestart.co.uk www.gov.uk	☒
Further	Journals: Journal of Small Business and Entrepreneurship Journal of Business Venturing Journal of Small Business Management Small Business Economics The Journal of Product Innovation Management.	☒

MODULE CODE: ACDA5004
TITLE: Project Management and Research Methods
DATED: 16/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: I100

AIM(S)

- To provide students with a critical awareness of the contemporary challenges facing IT managers and the key decisions they must take in order to satisfy the principal stakeholders to create quality systems within the promised timescale and budget. The student will be able to critically appreciate the importance of professional conduct and consider the ethical and legal issues facing IT personnel.
- To underpin academic research and the third year major project, and to provide students with a comprehensive and systematic understanding of the knowledge and skills needed to collect, interpret, analyse, synthesise and present data using appropriate research methods. The module will extend the student's technical expertise in information systems development such that s/he is able to evaluate the suitability of different development methods for different situations.

LEARNING OUTCOMES

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

1. Evaluate project management methods and techniques, and demonstrate an appreciation of the legal and ethical issues, including sustainability.
2. Demonstrate a critical awareness and systematic understanding of a range of contemporary project management techniques while working as a member of a team.
3. Review critically the current research literature pertinent to a research topic and communicate the results of the research to specialist and non-specialist audiences.
4. Demonstrate a sound understanding of research and development strategies and use these to produce a proposal suitable for a Major Project that meets ethical and sustainability guidelines.

INDICATIVE CONTENT

- Understanding the roles and responsibilities within project teams and the management of people and change.
- Ethical, legal and professional responsibilities incumbent on IS/IT managers, e.g. intellectual property, data protection, codes of practice (BCS), legal frameworks, contracts.
- Resourcing alternatives: for example, outsourcing, developing bespoke software or purchasing sophisticated software packages (such as enterprise systems)
- Project Planning: Function Point Analysis (FPA), Critical Path Analysis (PERT, CPM), Gantt Charts, Work Breakdown Structures (WBS).
- Concepts of Quality Management: quality assurance, quality control methods, quality standards.
- Factors influencing project success or failure
- Risk management: health and safety, sustainability and green drivers for project success

- BCS guidelines on Green and Sustainable IT
- Financial appraisal methods, e.g. payback, discounted cash flow
- Research principles and approaches (e.g. the research process, purpose, sources of data including primary/secondary research, quantitative/qualitative data, objective/hypothesis formation, reliability, validity, generalisability)
- Research design strategies, (e.g. experiments, surveys, case studies), their advantages and limitations, and their suitability to a variety of research contexts
- Data collection & sampling methods (e.g. interviews, questionnaires, observation), and their advantages and limitations in a variety of contexts
- Developing and structuring a research proposal: problem identification, formulating aims/hypotheses, sampling, sustainability and ethical issues and the practicalities of design
- Referencing conventions (e.g. the Harvard system, numeric system, IEEE)
- Critical, analytical thinking and writing

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Essay	2500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Research Proposal	2500 words	50%

Assessment Summary

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

READING LIST

Module Code	ACDA5004	
Module Title	Project Management and Research Methods	
Classification	Reading List entry	Electronic*
Essential	Hughes, B. (2015), 5 th Edition <i>Project Management for IT-Related Projects</i> , british Computer Society	☒
Essential	Marder, M. (2011) <i>Research Methods for Science</i> , Cambridge University Press: Cambridge.	☒
Essential	Weaver, P. (2004) <i>Success in Your Project: a Guide to Student System Development Projects</i> , Prentice Hall: Harlow	☒
Further	Newton, R. (2016), <i>Project Management Step by Step</i> , FT Publishing International	☒
Further	Dobson, M.S. (2010) <i>Creative Project Management</i> . McGraw-Hill	☒
Further	Larson, E.W. (2017) 7 th Edition, <i>Project Management</i> . McGraw-Hill	☐
Further	Sommerville, Ian (2015) <i>Software Engineering</i> , Global Edition, Pearson Education	☒
Further	Teagarden, David (2015) <i>Systems Analysis and Design: An Object-Oriented Approach with UML</i> 5th Edition, Wiley	☐
Further	Baase, S. (2008) 3 rd Edition <i>A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet</i> : International Edition, Pearson: NY	☒
Further	Klein, G. and Dabney, A. (2013) <i>The Cartoon Guide To Statistics</i> , Hill and Wang: NY.	☒
Further	Quinn, M. J. (2009) 3 rd Edition, <i>Ethics for the Information Age: International Edition</i> , Pearson: NY	☒
Further	http://www.acm.org	☒
Further	http://www.ieee.org	☒
Further	http://www.bcs.org	☒
Further	http://www.theregister.co.uk	☒

MODULE CODE: ACDA5005
TITLE: Smart and Connected Devices I
DATED: 16/08/2018

LEVEL: 5
CREDITS: 20

JACS CODE: H610

AIM(S)

Apply web technology to condition monitoring and control of IoT sensors and actuators.

LEARNING OUTCOMES

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

1. Implement an Internet of Things sensor/actuator and server link
2. Apply appropriate methods and tools to create suitable management and monitoring software

INDICATIVE CONTENT

- Internet of Things – Real World Interfaces
 - o Devices (hubs/controllers/microcontroller devices, sensors, actuators)
 - o Device operation – polled and interrupt driven interfaces
- Internet of Things – Transfer of Information
 - o Routers, modems and communications devices
 - o App based communications over IP and TCP/IP
 - o Mobile phone applications in control of actuators and use of sensor information
- Internet of Things – Servers and the middle tier
 - o Server side scripting – Apache & PHP, WAMP
 - o Databases interfacing, data management
- Internet of Things - User Interfaces and information display – CSS3, HTML5 and PHP
 - o Usability and information presentation
- Internet of Things - security

LEARNING AND TEACHING STRATEGY

Supporting self-study material may be used.

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Simulation and Report	2500 words	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Web based IoT Application and Report	2500 words	50%

Assessment Summary

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

READING LIST

Module Code	ACDA5005	
Module Title	Smart and Connected Devices I	
Classification	Reading List entry	Electronic*
Essential	IEEE Communications Society, Internet of Things Journal	☒
Further	Greengard, S, (2005), The Internet of Things (MIT Press Essential Knowledge) The MIT Press Essential Knowledge series)	☒
Further	Schwartz, M, (2016) Internet of Things with Arduino Cookbook, Packt Publishing	☒

Further	www.w3schools.com	☒
Further	Proteus User Guide	☒