

|                       |                                      |
|-----------------------|--------------------------------------|
| <b>Module Code</b>    | <b>ACCB5011</b>                      |
| <b>Title</b>          | <b>Advanced Software Development</b> |
| <b>Date</b>           | <b>09/09/2020</b>                    |
| <b>Level</b>          | <b>5</b>                             |
| <b>Credits</b>        | <b>20</b>                            |
| <b>Pre-Requisites</b> | <b>None</b>                          |

### **AIM(S)**

- To provide students 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:

- Critically evaluate the suitability of selected algorithms and data structures to solve given problems
- Develop OO solutions to solve a given problem scenario(s)

### **INDICATIVE CONTENT**

- Abstract data types (ADT)
- Simple data structures e.g. stacks, queues
- Complex data structures and algorithms e.g. lists, linked lists, heaps
- Graphs – properties and graph traversal
- Trees – properties, traversal, balancing
- Hashing
- Algorithms for sorting
- Algorithms for searching.
- Containers and iterators
- Object oriented concepts e.g. classes, objects, encapsulation, inheritance and polymorphism
- Essential object oriented programming principles

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment       | Volume                | Weighting |
|--------------------------|-----------------------|-----------|
| Implementation and Essay | 2500 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

| Module Code    | ACCB5011                                                                                                       |                          |
|----------------|----------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Advanced Software Development                                                                                  |                          |
| Classification | Reading List entry                                                                                             | Electronic*              |
| Essential      | Horton, I., Weert, P.V., (2018), Beginning C++17: From Novice to Professional, 5 <sup>th</sup> Edition, Apress | <input type="checkbox"/> |
| Essential      | Cormen, T.H., Leiserson, C.E., (2009) Introduction to Algorithms, MIT Press                                    | <input type="checkbox"/> |
| Further        | Greene, J., Stellman, A., (2020) Head First C#, 4 <sup>th</sup> Edition, O'Reilly                              | <input type="checkbox"/> |
| Further        | Weisfeld, M., (2018), The Object-Oriented Thought Process, Addison Wesley                                      | <input type="checkbox"/> |
| Further        | Sedgewick, R., (2011) Algorithms, 4th edition, Addison-Wesley                                                  | <input type="checkbox"/> |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Module Code</b>    | <b>ACCA5019</b>                    |
| <b>Title</b>          | <b>Business and Web Management</b> |
| <b>Date</b>           | <b>09/09/2020</b>                  |
| <b>Level</b>          | <b>5</b>                           |
| <b>Credits</b>        | <b>20</b>                          |
| <b>Pre-Requisites</b> | <b>None</b>                        |

### **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.

### **LEARNING OUTCOMES**

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

- Demonstrate a sound understanding of the principal forms of business strategy and the environment, leadership & management, motivation and business information systems.
- 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.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Component 2

☒ Written exam      ☐ Coursework      ☐ Practical

| Mode of assessment | Volume | Weighting |
|--------------------|--------|-----------|
| Presentation       | 15mins | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5019                                                                                                                                                |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Business and Web Management                                                                                                                             |                                     |
| Classification | Reading List entry                                                                                                                                      | Electronic *                        |
| Essential      | Mullins, L. J. (2019) (12 <sup>th</sup> Ed.) Management & Organisational Behaviour. Pearson.                                                            | <input checked="" type="checkbox"/> |
| Essential      | Chaffey, D. & Smith, P. R. (2017) (5 <sup>th</sup> Ed.) Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing. Routledge. | <input checked="" type="checkbox"/> |
| Further        | Chaffey, D. (2019) (7 <sup>th</sup> Ed.) Digital Business and E-Commerce Management, Pearson.                                                           | <input checked="" type="checkbox"/> |
| Further        | Piccoli, G. & Pigni, F. (2016) (3 <sup>rd</sup> Ed.) Information Systems for Managers: Text and Cases. Hoboken. Prospect Press.                         | <input checked="" type="checkbox"/> |

|         |                                                                                                                                               |                                     |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Daconta, Michael C. (2013) Great Cloud Migration: Your Roadmap to Cloud Computing, Big Data and Linked Data. Outskirts Press.                 | <input checked="" type="checkbox"/> |
| Further | Kingsnorth, S. (2016) Digital Marketing Strategy: An Integrated Approach to Online Marketing. Kogan Page.                                     | <input type="checkbox"/>            |
| Further | Damian, R. & Jones, C (2016) (4th Ed.) Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation. Kogan Page. | <input type="checkbox"/>            |
| Further | Sklar, J. (2014) (6th Ed.) Principles of Web Design. Course Technology.                                                                       | <input type="checkbox"/>            |
| Further | Krug, S. (2013) (3 <sup>rd</sup> Ed. Don't Make Me Think: A Common Sense Approach to Web Usability New Riders                                 | <input type="checkbox"/>            |
| Further | Sharma, A (2016) The Google Checklist: Marketing Edition, CreateSpace.                                                                        | <input type="checkbox"/>            |
| Further | <a href="http://businesscasestudies.co.uk">http://businesscasestudies.co.uk</a>                                                               | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.cbi.org.uk/">http://www.cbi.org.uk/</a>                                                                                   | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.informationweek.com">http://www.informationweek.com</a>                                                                   | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.forbes.com/technology/">http://www.forbes.com/technology/</a>                                                             | <input checked="" type="checkbox"/> |
| Further | Journal of Management Studies                                                                                                                 | <input checked="" type="checkbox"/> |
| Further | Journal of Organisational Behaviour                                                                                                           | <input checked="" type="checkbox"/> |
| Further | Management Today                                                                                                                              | <input checked="" type="checkbox"/> |
| Further | Harvard Business Review                                                                                                                       | <input checked="" type="checkbox"/> |
| Further | Information Systems Journal                                                                                                                   | <input checked="" type="checkbox"/> |
| Further | Information Systems Management                                                                                                                | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.useit.com/">http://www.useit.com/</a>                                                                                     | <input checked="" type="checkbox"/> |
| Further | <a href="http://marketingland.com">http://marketingland.com</a>                                                                               | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.digitaltrends.com/social-media/">http://www.digitaltrends.com/social-media/</a>                                           | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.ecommercetimes.com">http://www.ecommercetimes.com</a>                                                                     | <input checked="" type="checkbox"/> |
| Further | ACM Transactions on Internet Technology.                                                                                                      | <input checked="" type="checkbox"/> |
| Further | International Journal of Online Marketing (IJOM).                                                                                             | <input checked="" type="checkbox"/> |
| Further | Journal of Digital & Social Media Marketing.                                                                                                  | <input checked="" type="checkbox"/> |
| Further | International Journal of Electronic Commerce.                                                                                                 | <input checked="" type="checkbox"/> |

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5035</b>                                                              |
| <b>Title</b>          | <b>Changemakers: Building your Personal Brand for Sustainable Employment</b> |
| <b>Date</b>           | <b>25/06/2020</b>                                                            |
| <b>Level</b>          | <b>5</b>                                                                     |
| <b>Credits</b>        | <b>20</b>                                                                    |
| <b>Pre-Requisites</b> | <b>none</b>                                                                  |

### **AIM(S)**

- To build the skills and competencies necessary for career resilience and professional development for the future work context.

### **LEARNING OUTCOMES**

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

- Evaluate personal employability skills and their congruence with the skills required for professional practice in a real or simulated environment.
- Build a personal brand and promote a professional identity for a specific opportunity.

### **INDICATIVE CONTENT**

- Analysing your employment sector in order to identify problems, gaps in the market and how you can add value for sustainable employability.
- Building your brand and promoting a professional identity through personal skills analysis and personal development planning.
- Contemporary technologies: developing an online personal presence (e.g. basic website building/social media/blogs/vlogs etc.).
- Search techniques for employment/self-employment opportunities.
- Adopting project management approaches (defining the problem; setting the goals and objectives, milestones and monitoring, evaluation).
- Collaboration, networking, building social capital, negotiation and influencing.
- Awareness, emotional intelligence, well-being and resilience.
- Ethics, values, diversity, inclusion, intercultural awareness and responsible stewardship: issues, challenges and actions.
- Cultural and linguistic expression.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                    | Weighting |
|--------------------|---------------------------|-----------|
| Online portfolio   | 2,000 words or equivalent | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☒ Practical

| Mode of assessment | Volume                    | Weighting |
|--------------------|---------------------------|-----------|
| Assignment         | 2,000 words or equivalent | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

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

|                       |                                                                                                                                                                                                              |                                     |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCA5035                                                                                                                                                                                                     |                                     |
| <b>Module Title</b>   | Changemakers: Building your Personal Brand for Sustainable Employment                                                                                                                                        |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                                                    | <b>Electronic *</b>                 |
| Essential             | Lock, D. (2018). <i>Project management</i> . Routledge                                                                                                                                                       | <input checked="" type="checkbox"/> |
| Essential             | Dweck, C. (2017) <i>Mindset: Changing The Way You think To Fulfil Your Potential</i> . Robinson Publishers.                                                                                                  | <input checked="" type="checkbox"/> |
| Essential             | Griffith, B.A. (2014) <i>Working in Teams: Moving From High Potential to High Performance</i> . SAGE Publications Inc.                                                                                       | <input checked="" type="checkbox"/> |
| Essential             | Baguley, P. (2003). <i>Teams and team-working</i> (New ed.). London: Teach Yourself.                                                                                                                         | <input type="checkbox"/>            |
| Essential             | Gensler, H. J. (2017). <i>Ethics : A contemporary introduction</i> (3 <sup>rd</sup> ed., Routledge contemporary introductions to philosophy). New York: Routledge.                                           | <input type="checkbox"/>            |
| Essential             | Well-being of Future Generations (Wales) Act 2015 (Online). Available at <a href="http://www.legislation.gov.uk/anaw/2015/2/contents/enacted">http://www.legislation.gov.uk/anaw/2015/2/contents/enacted</a> | <input checked="" type="checkbox"/> |
| Further               | Smale, B. and Fowlie, J. (2015) <i>How to Succeed at University an Essential Guide to Academic Skills and Personal Development</i> (2 <sup>nd</sup> Ed.). Los Angeles, [Calif.]: SAGE Study Skills Ser. Web. | <input checked="" type="checkbox"/> |
| Further               | Phillips, S. (2014) <i>The complete guide to professional networking : the secrets of online and offline success</i> . London, England : Kogan Page                                                          | <input checked="" type="checkbox"/> |
| Further               | Snow, S. (2018) <i>Dream Teams: Working Together Without Falling Apart</i> . Piatkus.                                                                                                                        | <input checked="" type="checkbox"/> |
| Further               | <i>Williams, B. (2020) Diversity in the Workplace: Eye-Opening Interviews to Jumpstart Conversations about Identity, Privilege, and Bias</i> . Rockridge Press                                               | <input checked="" type="checkbox"/> |
| Further               | Dawson, P. and Andriopoulos, C. (2017) <i>Managing Change, Creativity and Innovation</i> . SAGE Publications Ltd.                                                                                            | <input checked="" type="checkbox"/> |
| Further               | Clements, P., & Jones, J. (2008). <i>The diversity training handbook a practical guide to understanding &amp; changing attitudes</i> (3rd ed.). London ; Philadelphia: Kogan Page.                           | <input checked="" type="checkbox"/> |

|                       |                                                    |
|-----------------------|----------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5033</b>                                    |
| <b>Title</b>          | <b>Changemakers: Creativity and Value Creation</b> |
| <b>Date</b>           | <b>25/06/2020</b>                                  |
| <b>Level</b>          | <b>5</b>                                           |
| <b>Credits</b>        | <b>20</b>                                          |
| <b>Pre-Requisites</b> | <b>None</b>                                        |

### **AIM(S)**

- To develop the concepts and practice of creativity and value creation for the development of innovative, aspiring and progressive solutions.

### **LEARNING OUTCOMES**

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

- Demonstrate knowledge and critical understanding of innovation, creativity and enterprising mindset, recognising the values and the contribution creativity makes to the common good.
- Conceive, articulate and apply creative thinking within a work-based or academic context to develop novel solutions and/or value creation.

### **INDICATIVE CONTENT**

- Creativity in theory and practice.
- Value creation in theory and practice.
- Creative and ethical leadership: skills and challenges.
- Driving innovation and change, the intra and entrepreneurial individual.
- Critical thinking, troubleshooting and problem solving, developing novel solutions.
- Information gathering for inspiration, vision creation and ideation.
- Developing the enterprising and data driven mindset.
- Contemporary technologies: virtual and augmented reality and artificial intelligence to enhance creativity and innovation.
- Time management practices for an entrepreneurial mindset.
- Being resourceful, in the context of making do with less.
- Reflection and self-reflection.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                | Volume                    | Weighting |
|-----------------------------------|---------------------------|-----------|
| Online portfolio of set exercises | 2,000 words or equivalent | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                    | Weighting |
|--------------------|---------------------------|-----------|
| Assignment         | 2,000 words or equivalent | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

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

| Module Code    | <b>ACCA5033</b>                                                                                                                                       |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Changemakers: Creativity and Value Creation                                                                                                           |                                     |
| Classification | Reading List entry                                                                                                                                    | Electronic*                         |
| Essential      | Hargreaves, J., and Page, L. (2013) <i>Reflective Practice</i> . (Key Themes in Health and Social Care Series). Polity Press.                         | <input checked="" type="checkbox"/> |
| Essential      | Nardi, P.M. (2017) <i>Critical Thinking : Tools for Evaluating Research</i> . University of California Press                                          | <input checked="" type="checkbox"/> |
| Essential      | Westerman, G., Bonnet, D. and McAfee, A., <i>Leading Digital: Turning Technology Into Business Transformation</i> . (Audiobook) Recorded Books. 2017. | <input checked="" type="checkbox"/> |
| Further        | Schiama, G. (2011) <i>Managing Knowledge Assets and Business Value Creation in Organizations : Measures</i>                                           | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                                              |   |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|         | <i>and Dynamics</i> Hershey, Pa.: Business Reference Service.                                                                                                                                                |   |
| Further | Rescher, N. (2014). <i>A System of Pragmatic Idealism, Volume II The Validity of Values, A Normative Theory of Evaluative Rationality</i> (Princeton Legacy Library). Princeton: Princeton University Press. | ☒ |
| Further | Turner, E. (2020) <i>Be Less Zombie: How great companies create dynamic innovation, fearless leadership and passionate people</i> . John Wiley & Sons.                                                       | ☒ |

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA5025</b>                     |
| <b>Title</b>          | <b>Cloud Computing Architecture</b> |
| <b>Date</b>           | <b>09/09/2020</b>                   |
| <b>Level</b>          | <b>5</b>                            |
| <b>Credits</b>        | <b>20</b>                           |
| <b>Pre-Requisites</b> | <b>None</b>                         |

### AIM(S)

- To provide students with a systematic understanding of the principles underlying the architecture of cloud computing infrastructure and the deployment of applications within that infrastructure.

### LEARNING OUTCOMES

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

- Demonstrate an understanding of virtualisation for the deployment of applications.
- Critically evaluate a cloud computing infrastructure, within the context of “as a Service” applications.

### INDICATIVE CONTENT

- Virtualisation principles and best practice.
- Virtual machines and virtual networks.
- Type 1 hypervisors, e.g. Hyper-V.
- “as a Service” cloud-based models, e.g.:
  - Infrastructure as a Service
  - Platform as a Service
  - Software as a Service
- Introductory containerisation.
- Web Service design and deployment.

### Study Time Allocation

The study time for the module is divided as follows:

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

### ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                | Weighting |
|--------------------|-----------------------|-----------|
| Practical + Report | 2500 words equivalent | 50%       |

### Assessment Summary

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

### INDICATIVE READING LIST

|                       |                                                                                                                 |                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCA5025                                                                                                        |                                     |
| <b>Module Title</b>   | Cloud Computing Architecture                                                                                    |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                       | <b>Electronic*</b>                  |
| Essential             | Stephen Orban. Ahead in the Cloud: Best Practices for Navigating the Future of Enterprise IT. 2018, CreateSpace | <input checked="" type="checkbox"/> |
| Essential             | Thomas Erl, Robert Cope, Amin Naserpour. Cloud Computing Design Patterns. 2017, Prentice Hall                   | <input type="checkbox"/>            |
| Further               | ACM                                                                                                             | <input checked="" type="checkbox"/> |
| Further               | IEEE                                                                                                            | <input checked="" type="checkbox"/> |
| Further               | Computer Networking                                                                                             | <input checked="" type="checkbox"/> |
| Further               | Data Communications                                                                                             | <input checked="" type="checkbox"/> |

|                       |                           |
|-----------------------|---------------------------|
| <b>Module Code</b>    | <b>ACCD5000</b>           |
| <b>Title</b>          | <b>Computer Forensics</b> |
| <b>Date</b>           | <b>09/09/2020</b>         |
| <b>Level</b>          | <b>5</b>                  |
| <b>Credits</b>        | <b>20</b>                 |
| <b>Pre-Requisites</b> | <b>None</b>               |

### **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:

- 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.
- 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.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Coursework         | 4000 words | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                                             |                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCD5000                                                                                                                    |                                     |
| <b>Module Title</b>   | Computer Forensics                                                                                                          |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                   | <b>Electronic*</b>                  |
| Essential             | The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics. Author: John Sammons.                 | <input type="checkbox"/>            |
| Essential             | Digital Evidence and Computer Crime: Forensic Science, Computers, and the Internet. Author: Eoghan Casey.                   | <input type="checkbox"/>            |
| Essential             | Digital Forensics with Open Source Tools. Authors: Cory Altheide and Harlan Carvey                                          | <input type="checkbox"/>            |
| Essential             | X-Ways Forensics Practitioner's Guide: Authors: Brett Shavers and Eric Zimmerman.                                           | <input type="checkbox"/>            |
| Further               | Incident Response and Computer Forensics, Second Edition. Authors: Chris Prosis, Kevin Mandia, and Matt Pepe.               | <input type="checkbox"/>            |
| Further               | Incident Response: Computer Forensics Toolkit. Author: Douglas Schweizer.                                                   | <input type="checkbox"/>            |
| Further               | Forensic Computing: A Practitioner's Guide, Second edition. Authors: Tony Sammes and Brian Jenkinson.                       | <input type="checkbox"/>            |
| Further               | <b>Journals</b><br>IEEE/ACM, IEEE/ACM Transactions on Networking<br>IEEE, IEEE Network Magazine<br>Science Direct<br>Scopus | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|         | ACM Transactions on Database Systems<br>ACM Transactions on Information Systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| Further | <b>Websites</b><br><a href="http://www.tandf.co.uk/15567281">http://www.tandf.co.uk/15567281</a><br><a href="http://www.cftt.nist.gov">www.cftt.nist.gov</a><br><a href="http://www.jdfsl.org/">http://www.jdfsl.org/</a><br>CERIAS Forensics Research<br>( <a href="http://www.cerias.purdue.edu/research/forensics/">http://www.cerias.purdue.edu/research/forensics/</a> )<br>DoD Cyber Crime Center ( <a href="http://www.dc3.mil">http://www.dc3.mil</a> )<br><a href="http://www.digitalforensicsmagazine.com/">http://www.digitalforensicsmagazine.com/</a><br><a href="http://nij.ncjrs.org/publications/pubs_db.asp">http://nij.ncjrs.org/publications/pubs_db.asp</a> | ☒ |

|                       |                                              |
|-----------------------|----------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5026</b>                              |
| <b>Title</b>          | <b>Databases and Application Development</b> |
| <b>Date</b>           | <b>09/09/2020</b>                            |
| <b>Level</b>          | <b>5</b>                                     |
| <b>Credits</b>        | <b>20</b>                                    |
| <b>Pre-Requisites</b> | <b>None</b>                                  |

### **AIM(S)**

- To provide students with a systematic understanding of the concepts underlying the design and development of databases and data applications for real-world problems.

### **LEARNING OUTCOMES**

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

- Critically evaluate the concepts, technologies and techniques used in the design and development of databases and data applications.
- Select and deploy appropriate concepts, technologies and techniques to design and implement database solutions and backend data applications for real-world problem scenarios.

### **INDICATIVE CONTENT**

- Relational database concepts e.g. data independence, normalisation techniques, transaction management.
- Database query languages e.g. Structured Query Language (SQL).
- NoSQL and NewSQL database concepts.
- Data models e.g. entity-relationship, object-oriented, object-relational, and NoSQL models.
- Software programming languages, development libraries, frameworks, object-oriented design methods, design patterns, and architectural models for data applications.
- Data access, management and manipulation techniques, options for preserving data and dynamic data content, and displaying data user interfaces and views.
- Security, authorisation and authentication measures in databases and data applications.
- Testing, debugging, and evaluation techniques and tools.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume         | Weighting |
|--------------------|----------------|-----------|
| Portfolio          | 6 - 8 elements | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5026                                                                                                                                                       |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Databases and Application Development                                                                                                                          |                                     |
| Classification | Reading List entry                                                                                                                                             | Electronic*                         |
| Essential      | Connolly, T., Begg, C., 2015, <i>Database Systems: A Practical Approach to Design, Implementation and Management</i> , 6th Edition, Addison Wesley             | <input checked="" type="checkbox"/> |
| Essential      | Viescas, J. L., 2018, <i>SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL</i> , 4 <sup>th</sup> Edition, Addison-Wesley Professional | <input checked="" type="checkbox"/> |
| Essential      | Joshi, B., 2019, <i>Beginning Database Programming Using ASP.NET Core 3: With MVC, Razor Pages, Web API, jQuery, Angular, SQL Server, and NoSQL</i> , Apress   | <input checked="" type="checkbox"/> |
| Further        | Freeman, A., 2020, <i>Pro ASP.NET Core 3: Develop Cloud-Ready Web Applications Using MVC 3, Blazor, and Razor Pages</i> , 8 <sup>th</sup> Edition, Apress      | <input checked="" type="checkbox"/> |
| Further        | Lock, A., 2018, <i>ASP.NET Core in Action</i> , Manning Pub                                                                                                    | <input checked="" type="checkbox"/> |
| Further        | Kleppmann, M., 2017, <i>Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems</i> , O'Reilly Media          | <input checked="" type="checkbox"/> |
| Further        | Sharp, J., 2018, <i>Microsoft Visual C# Step by Step</i> (9th Edition), Microsoft Press                                                                        | <input checked="" type="checkbox"/> |
| Further        | Troelsen, A., Japiske, P., 2017, <i>Pro C# 7: With .NET and .NET Core</i> , 8 <sup>th</sup> Edition, Apress                                                    | <input checked="" type="checkbox"/> |

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA5034</b>                     |
| <b>Title</b>          | <b>Data Security and Compliance</b> |
| <b>Date</b>           | <b>09/09/2020</b>                   |
| <b>Level</b>          | <b>5</b>                            |
| <b>Credits</b>        | <b>20</b>                           |
| <b>Pre-Requisites</b> | <b>None</b>                         |

### **AIM(S)**

- To provide students with the basic concepts and understanding about threats and vulnerabilities present in systems. They must learn how to use the information assets securely to support the goals and objectives of organisations through information security governance, risk management and regulatory compliance.

### **LEARNING OUTCOMES**

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

- Understand the key issues associated with inspection, protection, detection of and reaction to threats to information assets.
- Provide an overview of the field of information security assurance, governance, policies, risk management and regulatory compliance.

### **INDICATIVE CONTENT**

- Introduction to Information Security
- The Need for Security
- Legal, Ethical, and Professional Issues in Information Security
- Planning for Security
- Risk Management
- Regulatory Acts
- Security Governance Concepts, Principles, and Policies
- How does security governance interact with risk management?
- Security Technology: Access Controls, Firewalls, and VPNs
- Security Technology: Intrusion Detection and Prevention Systems and Other Security Tools
- Cryptography
- Physical Security
- Implementing Information Security
- Security and Personnel
- Information Security Maintenance

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

(Tick one)

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                 | Weighting |
|--------------------|------------------------|-----------|
| Portfolio          | 5,000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5034                                                                                                                              |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Data Security and Compliance                                                                                                          |                                     |
| Classification | Reading List entry                                                                                                                    | Electronic*                         |
| Essential      | Principles of Information Security, 6th Edition<br>Michael E. Whitman   Herbert J. Mattord<br>Copyright 2018                          | <input type="checkbox"/>            |
| Essential      | Ladley, J. (2012), Data Governance: How to Design, Deploy and Sustain an Effective Data Governance Program, Morgan Kaufmann, MA, USA. | <input checked="" type="checkbox"/> |
| Essential      | Plotkin, D. (2013), Data Stewardship: An Actionable Guide to Effective Data Management and Data Governance, Morgan Kaufmann, MA, USA. | <input checked="" type="checkbox"/> |
| Further        | CISSP Guide to Security Essentials, 2nd Edition.<br>Peter H. Gregory, Copyright 2015. ISBN-10: 130584601X ISBN-13: 9781305846012      | <input checked="" type="checkbox"/> |

|         |                                                                                                                                           |   |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------|---|
| Further | Information Security Governance: A Practical Development and Implementation Approach by Krag Brotby. ISBN: 978-1-118-58551-1. August 2017 | ☒ |
| Further | Gregory, P.H. (2015) CISSP Guide to Security Essentials, 2nd Edition. Course Technology.                                                  | ☒ |
| Further | Quinn, M. J. (2015), Ethics for the Information Age: International Edition, Pearson: NY, 2015                                             | ☒ |
| Further | Brotby, K. (2017), Information Security Governance: A Practical Development and Implementation Approach, Wiley.                           | ☒ |
| Further | IEEE/ACM, IEEE/ACM Transactions on Networking                                                                                             | ☒ |
| Further | IEEE, IEEE Network Magazine                                                                                                               | ☒ |
| Further | Science Direct                                                                                                                            | ☒ |
| Further | Scopus                                                                                                                                    | ☒ |
| Further | ACM Transactions on Database Systems                                                                                                      | ☒ |
| Further | ACM Transactions on Information Systems                                                                                                   | ☒ |
| Further | CISCO Academy Website, cisco.netacad.net (password access only)                                                                           | ☒ |

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| <b>Module Code</b>    | <b>ACDA5003</b>                                  |
| <b>Title</b>          | <b>Enterprise &amp; Innovation Group Project</b> |
| <b>Date</b>           | <b>16/08/2018</b>                                |
| <b>Level</b>          | <b>5</b>                                         |
| <b>Credits</b>        | <b>20</b>                                        |
| <b>Pre-Requisites</b> | <b>None</b>                                      |

### **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   |            |             |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE 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.           | <input checked="" type="checkbox"/> |
| Essential      | Williams, S (2016) (30th Ed.), The FT Guide to Business Start Up 2017/18: The Most Comprehensive Guide for Entrepreneurs, FT Publishing International. | <input checked="" type="checkbox"/> |
| Further        | Barringer, B. R. (2015) (4th Ed.), Entrepreneurship, Pearson.                                                                                          | <input type="checkbox"/>            |

|         |                                                                                                                                                                                                                   |                                     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Ries, E. (2011) The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, Portfolio Penguin.                                                                                             | <input type="checkbox"/>            |
| Further | Kerzner, H, (2017) Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley.                                                                                                        | <input type="checkbox"/>            |
| Further | Brechner, E (2015) Agile Project Management with Kanban, Microsoft Press.                                                                                                                                         | <input type="checkbox"/>            |
| Further | Haber, J. (2016) The Business of Good: Social Entrepreneurship and the New Bottom Line, Entrepreneur Press.                                                                                                       | <input type="checkbox"/>            |
| Further | Gelobter, M (2015) Lean Startups for Social Change: The Revolutionary Path to Big Impact, EDS Publications Ltd.                                                                                                   | <input type="checkbox"/>            |
| Further | Curedale, R (2016) (3rd Ed.), Design Thinking Process and Methods, Design College Inc.                                                                                                                            | <input type="checkbox"/>            |
| Further | Lewrick, M et. Al. (2018) The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems, John Wiley & Sons.                                                | <input type="checkbox"/>            |
| Further | Horowitz, P. & Hill, W, (2015) The Art of Electronics, Cambridge University Press.                                                                                                                                | <input checked="" type="checkbox"/> |
| Further | Scherz, P &, Monk, S, (2016) Practical Electronics for Inventors, Mc Graw Hill.                                                                                                                                   | <input checked="" type="checkbox"/> |
| Further | Cowan, A. (2012) Starting a Tech Business: A Practical Guide for Anyone Creating or Designing Applications or Software, John Wiley & Sons.                                                                        | <input type="checkbox"/>            |
| Further | Waite, R (2015) Online Business Startup: The entrepreneur's guide to launching a fast, lean and profitable online venture, Rethink Press Limited.                                                                 | <input type="checkbox"/>            |
| Further | Elektor magazine                                                                                                                                                                                                  | <input type="checkbox"/>            |
| Further | Electronics World Magazine                                                                                                                                                                                        | <input type="checkbox"/>            |
| Further | Websites:<br>www.entrepreneur.com<br>www.entrepreneurship.org<br>www.isbe.org.uk<br>www.jsbe.com<br>www.ft.com/management/entrepreneurship<br>www.bytestart.co.uk<br>www.gov.uk                                   | <input checked="" type="checkbox"/> |
| Further | Journals:<br>Journal of Small Business and Entrepreneurship<br>Journal of Business Venturing<br>Journal of Small Business Management<br>Small Business Economics<br>The Journal of Product Innovation Management. | <input checked="" type="checkbox"/> |

|                       |                                         |
|-----------------------|-----------------------------------------|
| <b>Module Code</b>    | <b>ACCB5017</b>                         |
| <b>Title</b>          | <b>Games Architecture and Mechanics</b> |
| <b>Date</b>           | <b>09/09/2020</b>                       |
| <b>Level</b>          | <b>5</b>                                |
| <b>Credits</b>        | <b>20</b>                               |
| <b>Pre-Requisites</b> | <b>None</b>                             |

### **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:

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

### **INDICATIVE CONTENT**

- Games programming principles and techniques
- Games programming design patterns
- 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.
- Importing game resources e.g. textures, audio, 3D models, etc
- Principles of 3D graphics and the Graphics pipeline
- Graphics APIs, eg OpenGL
- Physics Engine architecture
- Mechanics
- Bounding Volumes
- Collision Detection
- Collision Response
- Numerical Integration and updates

- Physics Engine APIs and libraries, eg Bullet, PhysX, etc.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written Assessment | 2500 words | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Written Assessment | 2500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                                                       |                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCB5017                                                                                                                              |                                     |
| <b>Module Title</b>   | Games Architecture and Mechanics                                                                                                      |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                             | <b>Electronic*</b>                  |
| Essential             | Millington. I. (2010) Game Physics Engine Development 2 <sup>nd</sup> Edition, CRC Press                                              | <input checked="" type="checkbox"/> |
| Essential             | Van Verth, J.M, Bishop, L.M (2015) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann | <input checked="" type="checkbox"/> |
| Essential             | Hearn, D and Baker, P.M (2010) Computer Graphics with OpenGL, 4 <sup>th</sup> Edition, Prentice Hall                                  | <input checked="" type="checkbox"/> |
| Essential             | Nystrom, R (2014) Games Programming Patterns, Genever Benning                                                                         | <input checked="" type="checkbox"/> |
| Further               | Shreiner, D, et al (2016) OpenGL Programming Guide, 9th Edition, Addison-Wesley                                                       | <input checked="" type="checkbox"/> |

|           |                                                                                                                       |                          |
|-----------|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further   | Lengyel, E (2011) Mathematics for 3D Game Programming and Computer Graphics 3 <sup>rd</sup> Edition, Cengage Learning | <input type="checkbox"/> |
| Essential | Lengyel, E. (2016) Foundations of Game Engine Development, Volume 1: Mathematics, Terathon Software.                  | <input type="checkbox"/> |
| Further   | Lengyel, E. (2016) Foundations of Game Engine Development, Volume 2: Rendering, Terathon Software.                    | <input type="checkbox"/> |

|                       |                                         |
|-----------------------|-----------------------------------------|
| <b>Module Code</b>    | <b>ACCA5027</b>                         |
| <b>Title</b>          | <b>Geographical Information Systems</b> |
| <b>Date</b>           | <b>09/09/2020</b>                       |
| <b>Level</b>          | <b>5</b>                                |
| <b>Credits</b>        | <b>20</b>                               |
| <b>Pre-Requisites</b> | <b>None</b>                             |

### **AIM(S)**

- To introduce the student to the science technology and management of geographical information. The student should develop a critical understanding of the underlying theories of GIS through examination of current GIS software trends. A coherent understanding of geovisualisation is regarded as a key concept and will be developed throughout the module.

### **LEARNING OUTCOMES**

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

- Evaluate and critically appraise a variety of application areas, which could benefit from a GIS solution.
- Demonstrate a conceptual understanding of visual perception and communications.
- Accurately identify spatial databases and understand the concepts of manipulating and representing spatial data solutions.

### **INDICATIVE CONTENT**

- Identifying types of data involved in Geo-information systems including DIGIMAP.
- Fundamental theories of spatial databases and spatial analysis including SQL.
- Geovisualisation and cartographic representation of sociodemographic data.
- The principles of thematic mapping and attributes of spatial data sets.
- Evaluating usage of GIS within the organisations including location-based services, location intelligence and epidemiology studies.
- Using appropriate GIS software for data analysis.
- Development of end user GIS applications

### **Study Time Allocation**

The study time for the module is divided as follows:

| <b>Activity type</b> | <b>Hours</b> | <b>Percentage</b> |
|----------------------|--------------|-------------------|
| Scheduled learning   | 48           | 24%               |

|                      |            |             |
|----------------------|------------|-------------|
| Independent learning | 152        | 76%         |
| Placement learning   | 0          | 0%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## ASSESSMENT

### Assessment Component 1

☐ Written exam
 ☒ Coursework
 ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Research Report    | 2500 words | 50%       |

### Assessment Component 2

☐ Written exam
 ☒ Coursework
 ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report / Demo      | 2500 words | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5027                                                                                                                    |                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Geographical Information Systems                                                                                            |                                     |
| Classification | Reading List entry                                                                                                          | Electronic*                         |
| Essential      | Longley, P, Goodchild, M, Maguire, D, Rhind, D (2015) <i>Geographical Information Systems and Science</i> , Wiley           | <input checked="" type="checkbox"/> |
| Essential      | Heywood, I., Cornelius, S. and Carver, S. (2011) <i>An Introduction to Geographical Information Systems</i> , Prentice Hall | <input checked="" type="checkbox"/> |
| Further        | Daniel, L., Loree, P. and Whitener, A. (2002) <i>Inside MapInfo Professional</i> , Onward Press,                            | <input type="checkbox"/>            |
| Further        | Worboys, M. and Duckham, M. (2004)                                                                                          | <input type="checkbox"/>            |
| Further        | Whitener, A. (1997) <i>MapBasic Developers Guide</i> , Onword Press                                                         | <input type="checkbox"/>            |
| Further        | <a href="http://www.mapinfo.co.uk">http://www.mapinfo.co.uk</a>                                                             | <input checked="" type="checkbox"/> |
| Further        | <a href="http://www.agi.org.uk/">http://www.agi.org.uk/</a>                                                                 | <input checked="" type="checkbox"/> |
| Further        | <a href="http://www.ordnancesurvey.co.uk/oswebsite/">http://www.ordnancesurvey.co.uk/oswebsite/</a>                         | <input checked="" type="checkbox"/> |
| Further        | <a href="http://ukdataservice.ac.uk/">http://ukdataservice.ac.uk/</a>                                                       | <input checked="" type="checkbox"/> |
| Further        | <a href="http://digimap.edina.ac.uk/digimap/home">http://digimap.edina.ac.uk/digimap/home</a>                               | <input checked="" type="checkbox"/> |

|                       |                               |
|-----------------------|-------------------------------|
| <b>Module Code</b>    | <b>ACCA5028</b>               |
| <b>Title</b>          | <b>Indie Game Development</b> |
| <b>Date</b>           | <b>09/09/2020</b>             |
| <b>Level</b>          | <b>5</b>                      |
| <b>Credits</b>        | <b>20</b>                     |
| <b>Pre-Requisites</b> | <b>None</b>                   |

### AIM(S)

- To synthesise software development concepts and the principles and techniques of games development with the aim of producing an independent (indie) game artefact.

### LEARNING OUTCOMES

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

- Develop a systematic understanding of the principles, concepts, and techniques used in the development of games.
- Synthesise and deploy appropriate technologies, software programming techniques, design patterns, frameworks, and games engine platforms in the development of indie games.

### INDICATIVE CONTENT

- Fundamentals of games development, such as concept development, gameplay design, core mechanics, user interfaces, game characters, storytelling, AI techniques, etc.
- Games development engines, e.g. Unity, Unreal, for developing cross-platform and mobile games.
- Frameworks and software design patterns for common problems in games development.
- Data persistence techniques for saving and loading data between sessions in games, e.g. JSON, serialisation and deserialization.
- Testing, debugging, and evaluation. Optimisation and performance techniques.

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume         | Weighting |
|--------------------|----------------|-----------|
| Portfolio          | 6 - 8 elements | 100%      |

### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA5028                                                                                                                                                                                    |                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Indie Game Development                                                                                                                                                                      |                                     |
| Classification | Reading List entry                                                                                                                                                                          | Electronic*                         |
| Essential      | Adams, E., 2013, <i>Fundamentals of Game Design</i> , 3 <sup>rd</sup> Edition, New Riders                                                                                                   | <input checked="" type="checkbox"/> |
| Essential      | Bond, J. B., 2017, <i>Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#</i> , 2 <sup>nd</sup> Edition, Addison-Wesley Professional | <input checked="" type="checkbox"/> |
| Essential      | Hocking, J., 2018, <i>Unity in Action: Multiplatform game development in C#</i> , 2 <sup>nd</sup> Edition, Manning Publications                                                             | <input checked="" type="checkbox"/> |
| Further        | Nystrom, R., 2014, <i>Game Programming Patterns</i> , Genever Benning                                                                                                                       | <input checked="" type="checkbox"/> |
| Further        | Baron, D., 2019, <i>Hands-On Game Development Patterns with Unity 2019: Create engaging games by using industry-standard design patterns with C#</i> , Packt Publishing                     | <input checked="" type="checkbox"/> |
| Further        | Daglow, D. L., 2018, <i>Indie Games: From Dream to Delivery</i> , Sausalito Media LLC                                                                                                       | <input checked="" type="checkbox"/> |
| Further        | Chandler, H. M., Chandler, R., 2010, <i>Fundamentals of Game Development</i> , Jones & Bartlett Learning                                                                                    | <input type="checkbox"/>            |
| Further        | Felicia, P., 2019, <i>Unity from Zero to Proficiency (Beginner): A Step-by-step guide to coding your first game</i>                                                                         | <input checked="" type="checkbox"/> |

|                       |                                               |
|-----------------------|-----------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5023</b>                               |
| <b>Title</b>          | <b>Network Operating Systems and Services</b> |
| <b>Date</b>           | <b>09/09/2020</b>                             |
| <b>Level</b>          | <b>5</b>                                      |
| <b>Credits</b>        | <b>20</b>                                     |
| <b>Pre-Requisites</b> | <b>None</b>                                   |

### **AIM(S)**

- To provide students with a sound understanding of the concepts, principles, skills and techniques required to manage and deploy network resources in a Network Operating Systems environment, e.g. Windows, or Linux.

### **LEARNING OUTCOMES**

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

- Apply a systematic understanding of network operating system environments to deploy, manage and maintain critical network services and resources.
- Analyse a given network to produce suitable security audit/disaster recovery strategy, working individually and as part of a team.

### **INDICATIVE CONTENT**

- Overview of Directory Services.
- Directory Services administration, e.g. user, computer accounts, group accounts.
- The name resolution process.
- Deployment, configuration and testing of a Domain Name System (DNS) server.
- Dynamic Host Configuration Protocol (DHCP) and its relevance to network deployment.
- Deployment, configuration and testing of a Dynamic Host Configuration Protocol (DHCP) server.
- Identification of the risks and threats to the security of resources and data (digital and physical).
- Disaster prevention and recovery methods.
- Principles and common levels of Redundant Array of Inexpensive Disk (RAID) arrays, e.g. 0, 1, 5, 6, 10.
- Virtualisation.
- Failover clustering and associated principles, e.g. quorum-based decision-making.

- Network load balanced clustering.
- Monitoring programs: use of network monitoring and management tools/protocols.
- Network penetration testing as pertains to the services explored.
- Legal, social and ethical issues.

### Study Time Allocation

The study time for the module is divided as follows:

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

### ASSESSMENT

#### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

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

#### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

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

#### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACCA5023                                                                                                                                                                        |                          |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Network Operating Systems and Services                                                                                                                                          |                          |
| Classification | Reading List entry                                                                                                                                                              | Electronic*              |
| Essential      | Bekim Dauti (2019) Windows Server 2019 Administration Fundamentals: A beginner's guide to managing and administering Windows Server environments, 2nd Edition. Packt Publishing | <input type="checkbox"/> |

|           |                                                                                        |                                     |
|-----------|----------------------------------------------------------------------------------------|-------------------------------------|
| Essential | Evi Nemeth et al. (2017) UNIX and Linux System Administration Handbook. Addison Wesley | <input type="checkbox"/>            |
| Further   | ACM                                                                                    | <input checked="" type="checkbox"/> |
| Further   | IEEE                                                                                   | <input checked="" type="checkbox"/> |
| Further   | Computer Networking                                                                    | <input checked="" type="checkbox"/> |
| Further   | Data Communications                                                                    | <input checked="" type="checkbox"/> |

|                       |                                |
|-----------------------|--------------------------------|
| <b>Module Code</b>    | <b>ACCA5029</b>                |
| <b>Title</b>          | <b>Network Programmability</b> |
| <b>Date</b>           | <b>09/09/2020</b>              |
| <b>Level</b>          | <b>5</b>                       |
| <b>Credits</b>        | <b>20</b>                      |
| <b>Pre-Requisites</b> | <b>None</b>                    |

### **AIM(S)**

- To give students the ability to work with network programmability and automation tools, with a further focus on software devops.

### **LEARNING OUTCOMES**

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

- Demonstrate a robust understanding of the key principles of network programmability tools and languages to solve specific problems.
- Apply appropriate analysis, design, implementation and testing techniques for programming and automation of network devices.

### **INDICATIVE CONTENT**

- Configuration management and orchestration tools, e.g. Chef, Puppet, Ansible, Saltstack, Terraform, Pulumi.
- Principles and practice of Infrastructure as Code (IaC).
- Key scripting languages for network programmability, e.g. Python, JavaScript, Bash, PowerShell.
- Software design principles for network engineers: devops, continuous integration, source control, etc.
- Necessary auxiliary technologies for network programmability, e.g. Linux, Mako, Ruby, XML, JSON, YAML.
- Data modelling languages, e.g. YANG.
- API programming for networking and automation, e.g. the NAPALM library.
- Programming for IoT implementation

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment      | Volume                | Weighting |
|-------------------------|-----------------------|-----------|
| Implementation + report | 2500 words equivalent | 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

| Module Code    | ACCA5029                                                                                                                                                 |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Network Programmability                                                                                                                                  |                                     |
| Classification | Reading List entry                                                                                                                                       | Electronic*                         |
| Essential      | Jason Edelman, Scott S. Lowe, Matt Oswalt. Network Programmability and Automation: Skills for the Next-Generation Network Engineer. 2018, O'Reilly Media | <input type="checkbox"/>            |
| Essential      | Kief Morris. Infrastructure as Code: Managing Servers in the Cloud. 2016, O'Reilly Media                                                                 | <input type="checkbox"/>            |
| Further        | Betsy Beyer, Jennifer Petoff, Chris Jones, Niall Richard Murphy. Site Reliability Engineering. 2016, O'Reilly                                            | <input type="checkbox"/>            |
| Further        | Sam Washington & M.O Faruque Sarker. Learning Python Network Programming 2015, Packt Publishing                                                          | <input type="checkbox"/>            |
| Further        | ACM                                                                                                                                                      | <input checked="" type="checkbox"/> |
| Further        | IEEE                                                                                                                                                     | <input checked="" type="checkbox"/> |
| Further        | Computer Networking                                                                                                                                      | <input checked="" type="checkbox"/> |
| Further        | Data Communications                                                                                                                                      | <input checked="" type="checkbox"/> |

|                       |                                                   |
|-----------------------|---------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5032</b>                                   |
| <b>Title</b>          | <b>Object Oriented Programming and Algorithms</b> |
| <b>Date</b>           | <b>09/09/2020</b>                                 |
| <b>Level</b>          | <b>5</b>                                          |
| <b>Credits</b>        | <b>20</b>                                         |
| <b>Pre-Requisites</b> | <b>None</b>                                       |

### **AIM(S)**

- To provide students with a conceptual understanding of abstract data types, data structures and algorithms used in web development and the ability to apply these concepts using object oriented (OO) development methods in web development scenarios

### **LEARNING OUTCOMES**

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

- Critically evaluate the suitability of selected algorithms and data structures to solve given problems
- Develop OO solutions to solve a given problem scenario(s) often encountered in web development

### **INDICATIVE CONTENT**

- Abstract data types (ADT)
- Simple data structures e.g. stacks, queues
- Complex data structures and algorithms e.g. lists, linked lists, heaps
- Graphs – properties and graph traversal
- Trees – properties, traversal, balancing
- Hashing
- Algorithms for sorting
- Algorithms for searching
- Containers and iterators
- Object oriented concepts e.g. classes, objects, encapsulation, inheritance and polymorphism
- Essential object oriented programming principles for web development

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment       | Volume                | Weighting |
|--------------------------|-----------------------|-----------|
| Implementation and Essay | 2500 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

| Module Code    | ACCA5032                                                                          |                                     |
|----------------|-----------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Object Oriented Programming and Algorithms                                        |                                     |
| Classification | Reading List entry                                                                | Electronic*                         |
| Essential      | Greene, J., Stellman, A., (2020) Head First C#, 4 <sup>th</sup> Edition, O'Reilly | <input type="checkbox"/>            |
| Essential      | Cormen, T.H., Leiserson, C.E., (2009) Introduction to Algorithms, MIT Press       | <input checked="" type="checkbox"/> |
| Further        | Weisfeld, M., (2018), The Object-Oriented Thought Process, Addison Wesley         | <input checked="" type="checkbox"/> |
| Further        | Sharp, J., (2018), Microsoft Visual C# Step by Step, Microsoft Press              | <input type="checkbox"/>            |
| Further        | Sedgewick, R., (2011) Algorithms, 4th edition, Addison-Wesley                     | <input type="checkbox"/>            |

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5036</b>                           |
| <b>Title</b>          | <b>Scripting and Programming Concepts</b> |
| <b>Date</b>           | <b>09/09/2020</b>                         |
| <b>Level</b>          | <b>5</b>                                  |
| <b>Credits</b>        | <b>20</b>                                 |
| <b>Pre-Requisites</b> | <b>None</b>                               |

### **AIM(S)**

- To instruct the development of software using a high level programming languages. Simple design concepts and good programming practice will be adopted.

### **LEARNING OUTCOMES**

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

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

### **INDICATIVE CONTENT**

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

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment                                   | Volume                | Weighting |
|------------------------------------------------------|-----------------------|-----------|
| Programming assignment with associated documentation | 4500 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5036                                                                                                                                                                         |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Scripting and Programming Concepts                                                                                                                                               |                                     |
| Classification | Reading List entry                                                                                                                                                               | Electronic*                         |
| Essential      | Robbins, J., (2018), Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, O'Reilly Media                                                          | <input type="checkbox"/>            |
| Essential      | Romano, F (2018) <i>Learn Python Programming: The no-nonsense, beginner's guide to programming, data science, and web development with Python 3.7</i> , 2nd Edition, Packt       | <input checked="" type="checkbox"/> |
| Further        | Cannon, J (2014) <i>Python Programming for Beginners: An Introduction to the Python Computer Language and Computer Programming</i> , CreateSpace Independent Publishing Platform |                                     |
| Further        | McGrath, M (2013) <i>Python in Easy Steps</i> , In Easy Steps Limited                                                                                                            |                                     |

|                       |                                                    |
|-----------------------|----------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA5030</b>                                    |
| <b>Title</b>          | <b>Software Engineering Principles and Testing</b> |
| <b>Date</b>           | <b>09/09/2020</b>                                  |
| <b>Level</b>          | <b>5</b>                                           |
| <b>Credits</b>        | <b>20</b>                                          |
| <b>Pre-Requisites</b> | <b>None</b>                                        |

### **AIM(S)**

- To enable students to evaluate and deploy appropriate software methodologies, software development methods, tools and techniques in the design and testing of software.

### **LEARNING OUTCOMES**

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

- Evaluate software development approaches, software development methodologies, software design techniques and approaches for collaborative working
- Recognise the importance of software testing and demonstrate knowledge of the essential principles of test development
- Apply effective judgement in the selection and deployment of software development principles and techniques in the implementation of 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 quality and complexity e.g. coding standards, Cyclomatic complexity
- Software development tools e.g. UML design tools, code coverage tools, software configuration management (SCM)
- Essential software testing principles and concepts e.g. Black Box vs White Box, Unit Testing
- Software test frameworks
- Software design principles and patterns e.g. cohesion vs coupling, Decorator Pattern

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment       | Volume                | Weighting |
|--------------------------|-----------------------|-----------|
| Essay and Implementation | 5000 words equivalent | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                                                         |                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCA5030                                                                                                                                |                                     |
| <b>Module Title</b>   | Software Engineering Principles and Testing                                                                                             |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                               | <b>Electronic*</b>                  |
| Essential             | Sommerville, I. (2015), Software Engineering, , Pearson                                                                                 | <input checked="" type="checkbox"/> |
| Essential             | Ammann, P., Offutt, J., (2016) Introduction to Software Testing, 2 <sup>nd</sup> Edition, Cambridge University Press                    | <input checked="" type="checkbox"/> |
| Further               | Gamma, E., Helm, R. Johnson, R., Vlissides, J., (1994), Design patterns : elements of reusable object-oriented software, Addison Wesley | <input checked="" type="checkbox"/> |
| Further               | Crispin, L., (2008), Agile Testing: A Practical Guide for Testers and Agile Teams, Addison-Wesley                                       | <input checked="" type="checkbox"/> |
| Further               | Martin, R., (2008), Clean Code: A Handbook of Agile Software Craftsmanship, Prentice Hall                                               | <input checked="" type="checkbox"/> |
| Further               | Langr, J., (2013), Modern C++ Programming with Test-Driven Development: Code Better, Sleep Better, Pragmatic Bookshelf                  | <input checked="" type="checkbox"/> |
| Further               | Sutherland, J., (2015) Scrum: The Art of Doing Twice the Work in Half the Time, Random House Business                                   | <input checked="" type="checkbox"/> |

|                       |                                |
|-----------------------|--------------------------------|
| <b>Module Code</b>    | <b>ACCB5021</b>                |
| <b>Title</b>          | <b>Statistical Programming</b> |
| <b>Date</b>           | <b>09/09/2020</b>              |
| <b>Level</b>          | <b>5</b>                       |
| <b>Credits</b>        | <b>20</b>                      |
| <b>Pre-Requisites</b> | <b>None</b>                    |

### AIM(S)

- To develop the knowledge and skills required to perform 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:

- Select and apply appropriate statistical methods for the analysis of experimental data
- Manipulate data and implement statistical programming techniques on large datasets
- Select and apply appropriate visualisation methods for the presentation of analytical data

### 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

### Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment   | Volume                | Weighting |
|----------------------|-----------------------|-----------|
| Programming problems | 2500 words equivalent | 50%       |

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment   | Volume                | Weighting |
|----------------------|-----------------------|-----------|
| Programming problems | 2500 words equivalent | 50%       |

### Assessment Summary

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

## INDICATIVE READING LIST

|                       |                                                                                                     |                                     |
|-----------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCB5021                                                                                            |                                     |
| <b>Module Title</b>   | Statistical Programming                                                                             |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                           | <b>Electronic*</b>                  |
| Essential             | Matloff, N (2013) <i>The Art of R Programming</i> , No Starch Press                                 | <input checked="" type="checkbox"/> |
| Further               | Kranzler, J.H. (2010) <i>Statistics for the Terrified</i> , Pearson                                 | <input checked="" type="checkbox"/> |
| Further               | Cotton, R (2013) <i>Learning R</i> , O'Reilly                                                       | <input checked="" type="checkbox"/> |
| Further               | Alvaro, F (2016) <i>R: Easy R Programming for Beginners</i> , Pearson                               | <input checked="" type="checkbox"/> |
| Further               | Spiegel, M.R (2014) <i>Shaum's Outline of Statistics, fifth ed.</i> , McGraw Hill Education Limited | <input checked="" type="checkbox"/> |
| Further               | Gonick, L & Smith, W. (2000) <i>Cartoon Guide to Statistics</i> , William Morrow Paperbacks         | <input checked="" type="checkbox"/> |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Module Code</b>    | <b>ACCA5031</b>                    |
| <b>Title</b>          | <b>Web and Mobile Technologies</b> |
| <b>Date</b>           | <b>09/09/2020</b>                  |
| <b>Level</b>          | <b>5</b>                           |
| <b>Credits</b>        | <b>20</b>                          |
| <b>Pre-Requisites</b> | <b>None</b>                        |

### **AIM(S)**

- To provide students with a systematic understanding of web and mobile using client- and server-side technologies.

### **LEARNING OUTCOMES**

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

- Evaluate the concepts, principles, technologies and techniques used in the development of web and mobile applications.
- Design and implement web and mobile applications using client- and server-side programming language(s) to resolve a range of 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
- Reading and validating data from web forms eg cleaning data, string processing
- Handling stateless HTTP eg cookies, sessions
- Dynamic content eg time-driven events
- Use of web-based data for different audiences eg mobile applications
- Programming for mobile applications
- Use of cross-platform techniques for mobile applications
- The DOM

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA5031                                                                                                                                                                          |                          |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Web and Mobile Technologies                                                                                                                                                       |                          |
| Classification | Reading List entry                                                                                                                                                                | Electronic*              |
| Essential      | Welling, L. (2016) PHP and MySQL Web Development, 5th Edition, Addison Wesley                                                                                                     | <input type="checkbox"/> |
| Further        | Nixon, R. (2016) <i>Learning PHP, MySQL &amp; JavaScript: With jQuery, CSS &amp; HTML5</i> , 4 <sup>th</sup> Edition, O'Reilly Media                                              | <input type="checkbox"/> |
| Further        | Snider, E (2019) <i>Mastering Xamarin.Forms: App architecture techniques for building multi-platform, native mobile apps with Xamarin.Forms 4</i> , 3rd Edition, Packt Publishing | <input type="checkbox"/> |
| Further        | Bennett, J (2018) <i>Xamarin in Action: Creating Native Cross-Platform Mobile Apps</i> , Manning Publications                                                                     | <input type="checkbox"/> |

## Level 6 modules

|                       |                                |
|-----------------------|--------------------------------|
| <b>Module Code</b>    | <b>ACCB6000</b>                |
| <b>Title</b>          | <b>Advanced Cyber Security</b> |
| <b>Date</b>           | <b>09/09/2020</b>              |
| <b>Level</b>          | <b>6</b>                       |
| <b>Credits</b>        | <b>20</b>                      |
| <b>Pre-Requisites</b> | <b>None</b>                    |

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

|                       |                                                                                                                                                                                                                            |                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCB6000                                                                                                                                                                                                                   |                                     |
| <b>Module Title</b>   | Advanced Cyber Security                                                                                                                                                                                                    |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                                                                  | <b>Electronic*</b>                  |
| Essential             | The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws, 2ed. Author: D. Stuttard.                                                                                                                    | <input checked="" type="checkbox"/> |
| 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 | <input checked="" type="checkbox"/> |
| Essential             | Cracking the Coding Interview: 189 Programming Questions and Solutions 6th Edition. Author: Gayle Laakmann.                                                                                                                | <input checked="" type="checkbox"/> |
| Essential             | Basic Security, Penetration Testing and How to Hack. Author: Isaac Sharpe.                                                                                                                                                 | <input type="checkbox"/>            |
| Essential             | Cyber Insecurity: Navigating the Perils of the Next Information Age. Author: Richard Harrison.                                                                                                                             | <input checked="" type="checkbox"/> |
| 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.                                                                 | <input checked="" type="checkbox"/> |
| Essential             | <a href="http://www.netacad.com">www.netacad.com</a> username & password required                                                                                                                                          | <input checked="" type="checkbox"/> |
| Further               | Applied Cryptography: Protocols, Algorithms and Source Code in C. Author: Bruce Schneir. (2015)                                                                                                                            | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | The Art of Exploitation, 2nd Edition. Author: Jon Erickson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/>            |
| Further | Beginner to Expert Guide to Computer Hacking, Basic Security, and Penetration Testing (Computer Science Series) Kindle Edition. Author: James Patterson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/>            |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/>            |
| Further | <b>Journals</b><br>IEEE/ACM, IEEE/ACM Transactions on Networking<br>IEEE, IEEE Network Magazine<br>Science Direct<br>Scopus<br>ACM Transactions on Database Systems<br>ACM Transactions on Information Systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <input checked="" type="checkbox"/> |
| Further | <b>Websites</b><br><a href="http://www.veracode.com/directory/owasp-top-10">http://www.veracode.com/directory/owasp-top-10</a><br><a href="http://www.vulnerabilityassessment.co.uk/Penetration%20Test.html">http://www.vulnerabilityassessment.co.uk/Penetration%20Test.html</a><br><a href="http://www.softwaretestinghelp.com/penetration-testing-tools/">http://www.softwaretestinghelp.com/penetration-testing-tools/</a><br><a href="https://www.owasp.org/index.php/Main_Page">https://www.owasp.org/index.php/Main_Page</a><br>DoD Cyber Crime Center ( <a href="http://www.dc3.mil">http://www.dc3.mil</a> )<br><a href="http://www.digitalforensicsmagazine.com/">http://www.digitalforensicsmagazine.com/</a><br><a href="http://www.dvwa.co.uk">www.dvwa.co.uk</a> | <input checked="" type="checkbox"/> |

|                       |                                                     |
|-----------------------|-----------------------------------------------------|
| <b>Module Code</b>    | <b>ACCA6011</b>                                     |
| <b>Title</b>          | <b>Artificial Intelligence and Machine Learning</b> |
| <b>Date</b>           | <b>09/09/2020</b>                                   |
| <b>Level</b>          | <b>6</b>                                            |
| <b>Credits</b>        | <b>20</b>                                           |
| <b>Pre-Requisites</b> | <b>None</b>                                         |

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## ASSESSMENT

### Assessment Component 1

☒ Written exam      ☐ Coursework      ☐ Practical

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

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Summary

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

## 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                                                    | <input checked="" type="checkbox"/> |
| Essential      | Millington, I. (2019) Artificial Intelligence for Games, 3 <sup>rd</sup> edition, CRC Press                                                                 | <input checked="" type="checkbox"/> |
| Essential      | Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. O'Reilly | <input checked="" type="checkbox"/> |
| Further        | Bishop, C.M. (2006) Pattern Recognition and Machine Learning, Springer                                                                                      | <input type="checkbox"/>            |
| Further        | Mark, D. (2009) Behavioral Mathematics for Game AI, Delmar                                                                                                  | <input type="checkbox"/>            |
| Further        | Schwab, B. , AI Game Engine Programming (2nd Edition), Charles River Media (2009)                                                                           | <input type="checkbox"/>            |
| Further        | Barber, M. (2012) <i>Bayesian Reasoning and Machine Learning</i> , Cambridge University Press                                                               | <input type="checkbox"/>            |

|                       |                                       |
|-----------------------|---------------------------------------|
| <b>Module Code</b>    | <b>ACCA6025</b>                       |
| <b>Title</b>          | <b>Cloud Computing Administration</b> |
| <b>Date</b>           | <b>09/09/2020</b>                     |
| <b>Level</b>          | <b>6</b>                              |
| <b>Credits</b>        | <b>20</b>                             |
| <b>Pre-Requisites</b> | <b>None</b>                           |

### **AIM(S)**

- To provide students with a systematic understanding of the major concepts and technologies upon which service-level cloud computing is built. The module will expose students to some of the more advanced cloud computing concepts that underpin more sophisticated cloud computing implementations.

### **LEARNING OUTCOMES**

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

- Demonstrate a systematic understanding of cloud computing concepts, principles and practice in the analysis and design of a robust solution from end user perspective.
- Exercise effective judgment in the analysis, planning, deployment and evaluation of core cloud design principles with respect to best practice

### **INDICATIVE CONTENT**

- Design, deployment, and operation of cloud services and distributed systems
- Understanding roles, access requirements and availability
- Application and Server management, server OS – Windows, Linux & Unix, Virtual Machines
- Application architecture and services, load balancing, resiliency and scalability
  - Amazon web services, MS Azure, Google Cloud, IBM Cloud Services
- Cloud security management
- Financial planning, costing metrics and pricing models
- Quality of service and service level agreements
- Disaster recovery strategy, redundancy

### **Study Time Allocation**

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                                                                                                                                                                                                                                                                                                                                           | Weighting |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Portfolio          | 6000 words equivalent<br>Students will produce a portfolio of work appropriate to the nature of their area of study. Portfolio elements may include a selection of the following: <ul style="list-style-type: none"> <li>• Written Report</li> <li>• Presentation slides</li> <li>• Software/hardware implementation</li> <li>• Demonstration of work</li> </ul> | 100%      |

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA6025                                                                                                                                                                                                             |                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Cloud Computing Administration                                                                                                                                                                                       |                                     |
| Classification | Reading List entry                                                                                                                                                                                                   | Electronic*                         |
| Essential      | Thomas Erl, Ricardo Puttini, Zaigham Mahmood (2013) Cloud Computing: Concepts, Technology & Architecture Prentice Hall                                                                                               | <input checked="" type="checkbox"/> |
| Essential      | Christina J. Hogan, Strata R. Chalup, Thomas A. Limoncelli (2015) Practice of Cloud System Administration, The: DevOps and SRE Practices for Web Services, Volume 2, Addison-Wesley Professional ISBN: 9780133478549 | <input checked="" type="checkbox"/> |
| Further        | Ray Rafaels (2015) Cloud Computing: From Beginning to End, CreateSpace Independent Publishing Platform                                                                                                               | <input checked="" type="checkbox"/> |
| Further        | IEEE Transactions on Cloud Computing                                                                                                                                                                                 | <input checked="" type="checkbox"/> |
| Further        | IEEE, IEEE Cloud Magazine                                                                                                                                                                                            | <input checked="" type="checkbox"/> |
| Further        | Science Direct                                                                                                                                                                                                       | <input checked="" type="checkbox"/> |

|         |                                                           |                                     |
|---------|-----------------------------------------------------------|-------------------------------------|
| Further | Scopus                                                    | <input checked="" type="checkbox"/> |
| Further | ACM Transactions on Internet Technology (TOIT)<br>Systems | <input checked="" type="checkbox"/> |

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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 | <input type="checkbox"/>            |
| Further        | S. Kane (2018), Docker: Up & Running: Shipping Reliable Containers in Production, O'Reilly Media                                                                          | <input type="checkbox"/>            |
| Further        | ACM                                                                                                                                                                       | <input checked="" type="checkbox"/> |
| Further        | IEEE                                                                                                                                                                      | <input checked="" type="checkbox"/> |

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

### 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:

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

### ASSESSMENT

#### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume     | Weighting |
|--------------------|------------|-----------|
| Report             | 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

### INDICATIVE READING LIST

|                       |                                                                                                                                                    |                                     |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCA6026                                                                                                                                           |                                     |
| <b>Module Title</b>   | Data Warehousing and Data Mining                                                                                                                   |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                          | <b>Electronic*</b>                  |
| Essential             | Loth, A., (2019) <i>Visual Analytics with Tableau</i> , Wiley                                                                                      | <input checked="" type="checkbox"/> |
| Essential             | Kimball, R. & Ross, M. (2016) <i>The Kimball Group Reader: Relentlessly Practical Tools for Data Warehousing and Business Intelligence</i> , Wiley | <input checked="" type="checkbox"/> |
| Further               | • Few, S. (2012), <i>Show Me The Numbers</i> , Analytics Press, Burlingame, CA.                                                                    | <input checked="" type="checkbox"/> |
| 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.     | <input checked="" type="checkbox"/> |

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

### 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:

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

### ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                                                                          | Weighting |
|--------------------|-------------------------------------------------------------------------------------------------|-----------|
| Portfolio          | May take the form of an essay, a presentation and/or an implementation<br>4000 words equivalent | 100%      |

### Assessment Summary

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

### INDICATIVE READING LIST

|                       |                                                                                                                                                                               |                                     |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Module Code</b>    | ACCB6019                                                                                                                                                                      |                                     |
| <b>Module Title</b>   | Emerging Trends                                                                                                                                                               |                                     |
| <b>Classification</b> | <b>Reading List entry</b>                                                                                                                                                     | <b>Electronic*</b>                  |
| 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                                                                | <input checked="" type="checkbox"/> |
| Further               | Stallings, W. (2017) Cryptography and Network Security: Principles and Practice (7th Edition), Pearson Education Limited                                                      | <input checked="" type="checkbox"/> |
| Further               | Sommerville, I. (2015), Software Engineering, , Pearson                                                                                                                       | <input checked="" type="checkbox"/> |

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

| Module Code    | ACCA6023                                                                                                                                                                                                    |                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Enterprise Networking, Security and Automation                                                                                                                                                              |                                     |
| Classification | Reading List entry                                                                                                                                                                                          | Electronic*                         |
| Essential      | <a href="http://www.netacad.com">www.netacad.com</a><br>username and password is required                                                                                                                   | <input checked="" type="checkbox"/> |
| 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 | <input checked="" type="checkbox"/> |
| Essential      | Scaling Networks v6 Companion Guide by Cisco Networking Academy, Cisco Press. Published Aug 3 2017                                                                                                          | <input checked="" type="checkbox"/> |
| Further        | W Odom (2019) CCNA 200-301 Official Cert Guide Library, Cisco Press part of the Official Cert Guide series                                                                                                  | <input type="checkbox"/>            |

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## ASSESSMENT

### Assessment Component 1

☒ Written exam      ☐ Coursework      ☐ Practical

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

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Summary

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

## INDICATIVE READING LIST

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

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

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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 <sup>th</sup> Edition                                                                      | <input checked="" type="checkbox"/> |
| Essential      | Kessenich, Sellers, Shreiner (2016) OpenGL® programming guide: the official guide to learning OpenGL®, version 4.5 with SPIR-V, 9 <sup>th</sup> Edition, Addison Wesley. | <input checked="" type="checkbox"/> |
| Further        | Foley, VanDam, Feiner, Hughes (2013), Computer Graphics: Principles and Practice 3rd edition, Addison Wesley                                                             | <input type="checkbox"/>            |
| Further        | Van Verth, J.M, Bishop, L.M (2015) Essential Mathematics for Games and Interactive Applications. A Programmers Guide, Morgan Kaufmann                                    | <input type="checkbox"/>            |
| Further        | Hill, F.S. and Kelley, S. M, (2015) Computer Graphics using OpenGL, 3rd Edition, Prentice Hall International Inc.                                                        | <input type="checkbox"/>            |

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Module Code</b>    | <b>ACCA6030</b>                     |
| <b>Title</b>          | <b>Information Systems Strategy</b> |
| <b>Date</b>           | <b>09/09/2020</b>                   |
| <b>Level</b>          | <b>6</b>                            |
| <b>Credits</b>        | <b>20</b>                           |
| <b>Pre-Requisites</b> | <b>None</b>                         |

### **AIM(S)**

- To allow students to evaluate critically the strategic role and impact of organisational information systems, and recognise that the effective and innovative management of information can create and sustain competitive advantage.

### **LEARNING OUTCOMES**

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

- Demonstrate a systematic understanding of current and emerging themes in information system development and the organisational impact of the use of information systems.
- Evaluate critically the issues associated with the management of information systems and the information systems strategy.

### **INDICATIVE CONTENT**

- The evolving role of information systems in organisations, leading to the strategic uses of IS/IT.
- The information systems strategy/business strategy relationship (strategic alignment and impact, Ward and Peppard's categories of strategic IS and critical success factors).
- The strategic IS planning process (e.g. Nolan's stages of growth, Earl and Gallier's frameworks)
- Frameworks for devising and/or assessing an information systems strategy within an organisation (e.g., Porter and Millar's 5 forces, Porter's generic strategies, Porter's value chain analysis, Porter and Millar's Information Intensity Matrix).
- Managing the information systems application portfolio (e.g. Ward et al matrix, Parsons' Generic Strategies, outsourcing).
- Current information systems development issues/themes (e.g. enterprise systems such as ERP, CRM and SCM, e-Business issues such as e-Marketing, e-HRM, e-Procurement, e-Learning, e-Government, mobile commerce).
- Security, privacy and ethical issues in information systems management.
- IS strategy and the organisational environment.

## Study Time Allocation

The study time for the module is divided as follows:

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

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Component 2

☐ Written exam      ☒ Coursework      ☐ Practical

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

### Assessment Summary

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

## INDICATIVE READING LIST

| Module Code    | ACCA6030                                                                                                                                                   |                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Title   | Information Systems Strategy                                                                                                                               |                          |
| Classification | Reading List entry                                                                                                                                         | Electronic*              |
| Essential      | Piccoli, G (2018) <i>Information Systems for Managers: Text and Cases, 3<sup>rd</sup> Edition</i> , Wiley, New Jersey, USA                                 | <input type="checkbox"/> |
| Essential      | Turban, E., Leidner, D., McLean, E. and Wetherbe, J. (2015), <i>Information Technology for Management</i> , 10th Ed., John Wiley and Sons: New Jersey, USA | <input type="checkbox"/> |
| Essential      | Chaffey, D (2019), <i>Digital Business and E-Commerce Management</i> , Pearson                                                                             | <input type="checkbox"/> |
| Further        | Jessup, L. & Valacich, J. (2015) <i>Information Systems Today: Managing in the Digital World</i> , 7 <sup>th</sup> Edition, Pearson                        | <input type="checkbox"/> |
| Further        | Laudon, K.C. & Laudon (2017) <i>Management Information Systems: Managing the Digital Firm</i> , 15th Ed, Pearson                                           | <input type="checkbox"/> |

|         |                                                                                                                  |                          |
|---------|------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Laudon, K.C. & Traver, C.G, <i>E-Commerce: Business, Technology, Society</i> , 15 <sup>th</sup> Edition, Pearson | <input type="checkbox"/> |
|---------|------------------------------------------------------------------------------------------------------------------|--------------------------|

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

### 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:

| <b>Activity type</b> | <b>Hours</b> | <b>Percentage</b> |
|----------------------|--------------|-------------------|
| Scheduled learning   | 10           | 5%                |
| Independent learning | 180          | 90%               |
| Placement learning   | 10           | 5%                |
| <b>TOTAL</b>         | <b>200</b>   | <b>100%</b>       |

## 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%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

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

|                       |                            |
|-----------------------|----------------------------|
| <b>Module Code</b>    | <b>ACCA6020</b>            |
| <b>Title</b>          | <b>Independent Project</b> |
| <b>Date</b>           | <b>25/06/2020</b>          |
| <b>Level</b>          | <b>6</b>                   |
| <b>Credits</b>        | <b>40</b>                  |
| <b>Pre-Requisites</b> | <b>None</b>                |

### **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   | 0          | 0%          |
| <b>TOTAL</b>         | <b>400</b> | <b>100%</b> |

## 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  | 0%          |
| Coursework    | 100%        |
| Practical     | 0%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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 <sup>rd</sup> edition, Palgrave. London. | <input checked="" type="checkbox"/> |
| Essential      | ASET, 2013 <i>Good Practice Guide for Workbased Learning and Placement Learning in Higher Education</i>                          | <input checked="" type="checkbox"/> |
| Essential      | Gray, D.E. (2018) <i>Doing Real World Research</i> , London: SAGE.                                                               | <input type="checkbox"/>            |
| Further        | Gallagher K, (2016) <i>Essential Study and Employment Skills For Business and Management Students</i> , Oxford                   | <input type="checkbox"/>            |
| Further        | Gottschall, Jonathan (2013), <i>The Storytelling Animal: How Stories Make Us Human</i> , Houghton Mifflin                        | <input type="checkbox"/>            |
| Further        | Storr, Will (2020), <i>The Science of Storytelling</i> , William Collins                                                         | <input type="checkbox"/>            |
| Further        | Cohen, L. Manion, L. and Morrison, K. (2017) <i>Research Methods in Education</i> , 8 <sup>th</sup> edition London: Routledge.   | <input checked="" type="checkbox"/> |

|         |                                                                                                                                                                                                                                                                                                                                       |                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | Flick, U. (2014) <i>An Introduction to Qualitative Research</i> , London: SAGE.                                                                                                                                                                                                                                                       | <input type="checkbox"/>            |
| Further | Aubrey, K. & Riley, A. (2017) <i>Understanding and Using Challenging Education Theories</i> , London: SAGE.                                                                                                                                                                                                                           | <input checked="" type="checkbox"/> |
| Further | Brinkmann, S. and Kvale, S. (2018) <i>Doing Interviews (Qualitative Research Kit)</i> . Sage                                                                                                                                                                                                                                          | <input type="checkbox"/>            |
| Further | Gibbs, G. (2018) <i>Analysing Qualitative Data (Qualitative Research Kit)</i> . Sage                                                                                                                                                                                                                                                  | <input checked="" type="checkbox"/> |
| Further | Creswell, J. W. (2012). <i>Qualitative inquiry and research design: Choosing among five approaches</i> . Sage                                                                                                                                                                                                                         | <input type="checkbox"/>            |
| Further | Obschonka, M., Hakkarainen, K., Lonka, K. <i>et al.</i> Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood. <i>Small Bus Econ</i> <b>48</b> , 487–501 (2017). <a href="https://doi.org/10.1007/s11187-016-9798-6">https://doi.org/10.1007/s11187-016-9798-6</a> | <input checked="" type="checkbox"/> |
| Further | <a href="https://ec.europa.eu/jrc/en/entrecomp">https://ec.europa.eu/jrc/en/entrecomp</a>                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |

|                       |                      |
|-----------------------|----------------------|
| <b>Module Code</b>    | <b>ACDB6003</b>      |
| <b>Title</b>          | <b>Major Project</b> |
| <b>Date</b>           | <b>31/01/2019</b>    |
| <b>Level</b>          | <b>6</b>             |
| <b>Credits</b>        | <b>20</b>            |
| <b>Pre-Requisites</b> | <b>None</b>          |

### AIM(S)

- To provide an opportunity for the student to develop and demonstrate their ability to manage a significant project of their own choice, related to the major themes of their chosen course.

### LEARNING OUTCOMES

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

- Critically evaluate technical and other literature and to apply the evidence gathered to solve a complex problem
- Demonstrate a professional and systematic approach to the solution of complex problems
- Demonstrate high level professional skills to present information both orally and in a written form
- Demonstrate the ability, as an individual, to plan a complex project and to produce a convincing artefact as a solution to the problem
- Understand and effectively apply the legal ethical and professional issues in the development of a project

### INDICATIVE CONTENT

- Overview of research and development methodologies suitable for student projects.
- Overview of common statistical techniques
- Visualisation of different data types
- Ethical issues
- Sustainability issues
- Establishing and justifying metrics, analysis of test results e.g. including software benchmarking,
- Contingency planning
- Development of documentation for academic projects
- Presentation of work produced to an academic audience
- Subject-specific content as required

### LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

| <b>Activity type</b> | <b>Hours</b> | <b>Percentage</b> |
|----------------------|--------------|-------------------|
| Scheduled learning   | 25           | 6%                |
| Independent learning | 375          | 94%               |
| Placement learning   | 0            | 0%                |
| <b>TOTAL</b>         | <b>400</b>   | <b>100%</b>       |

## ASSESSMENT

### Assessment Component 1

☐ Written exam      ☒ Coursework      ☐ Practical

| Mode of assessment | Volume                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Weighting                                  |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Portfolio          | <p>Students will produce a portfolio of work appropriate to the nature of their project. This will vary slightly according to the nature of the project undertaken (Survey-based, Review-based, Development-based or Experiment-based). Portfolio elements will include a selection of the following, to be agreed with the external examiner:</p> <ul style="list-style-type: none"> <li>• Written Report (all students)</li> <li>• Exhibition Board (all students)</li> <li>• Presentation slides (all students)</li> <li>• Code implementation</li> <li>• Electronics implementation</li> <li>• Demonstration of work</li> <li>• Ethical approval form</li> </ul> <p>Please see note below</p> | <p>100%</p> <p>12,000 words equivalent</p> |

The Major Project module requires students to undertake a 40 credit Computing or Electronics project, which varies the range of programmes taught in the school. For example, a review-based project completed by a Business Information Systems student will normally require a more detailed literature review than a practical Networking project implemented by a Computer Networks and Cybersecurity student. A student undertaking a Development-based project who has spent many weeks coding a lengthy software solution would produce a shorter written report to reflect the time taken (ie the code would be equivalent of word count) and so on.

Projects are currently categorised into Survey, Review, Development and Experiment projects with marking schemes which are appropriately weighted to the nature of the project. These will be agreed with the external examiner at the start of each academic year to make sure that students are assessed fairly and are not over-assessed.

Over the past 10 years, the module has been developed and perfected to include intermediate stages which leads to students building a portfolio of work for this module over the academic year ie “*stages in the creation of a single artefact or activity*”

### Assessment Summary

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

### INDICATIVE READING LIST

| Module Code    | ACDB6003                                                                                                                                                                             |                                     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Module Title   | Major Project                                                                                                                                                                        |                                     |
| Classification | Reading List entry                                                                                                                                                                   | Electronic*                         |
| Essential      | Avison, D. and Fitzgerald, G. (2007), <i>Information Systems Development: Methodologies, Techniques and Tools</i> , 4 <sup>th</sup> Edition McGraw-Hill: Maidenhead.                 | <input checked="" type="checkbox"/> |
| Essential      | Kranzler, J.H. (2017) <i>Statistics for the Terrified</i> , 6 <sup>th</sup> Edition , Rowman & Littlefield, Lanham.                                                                  | <input checked="" type="checkbox"/> |
| Essential      | McCormac, C and Davis, J. (2012) <i>Research Project Success: The Essential Guide for Science and Engineering Students</i> . RSC Publishing, Cambridge                               | <input checked="" type="checkbox"/> |
| Essential      | O'Leary, Z. (2013) <i>The Essential Guide to Doing Your Research Project</i> , 3 <sup>rd</sup> Edition, SAGE Publications Ltd                                                        | <input checked="" type="checkbox"/> |
| Essential      | Saunders, M., Lewis, P. and Thornhill, A. (2015), <i>Research Methods for Business Students</i> , 7 <sup>th</sup> Edition FT/Prentice Hall: Harlow                                   | <input checked="" type="checkbox"/> |
| Further        | Baase, S. (2012), <i>A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet: International Edition</i> , 4 <sup>th</sup> Edition Pearson: NY               | <input checked="" type="checkbox"/> |
| Further        | Collis, J. and Hussey, R. (2014) <i>Business Research: a Practical Guide for Undergraduate and Postgraduate Students</i> , 4 <sup>th</sup> Edition, Palgrave Macmillan: Basingstoke  | <input checked="" type="checkbox"/> |
| Further        | Cottrell, S.(2017) <i>Critical Thinking Skills: Developing Effective Analysis and Argument</i> , Palgrave Study Guides, 3 <sup>rd</sup> Edition, Palgrave Macmillan: Basingstoke     | <input checked="" type="checkbox"/> |
| Further        | Davies, M. B. and Hughes, N. (2014) <i>Doing a Successful Research Project: Using Qualitative Or Quantitative Methods</i> . 2 <sup>nd</sup> Edition, Palgrave Macmillan: Basingstoke | <input checked="" type="checkbox"/> |
| Further        | Dawson, C.W. (2015) <i>Projects in Computing and Information Systems: a Student's Guide</i> , 3 <sup>rd</sup> Edition Pearson Higher Education                                       | <input type="checkbox"/>            |
| Further        | Denscombe, M (2015) <i>The Good Research Guide</i> , 5 <sup>th</sup> Edition OU Press: Buckingham                                                                                    | <input checked="" type="checkbox"/> |

|         |                                                                                                                         |                          |
|---------|-------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Further | Few, S (2012) <i>Show Me the Numbers: Designing Tables and Graphs to Enlighten</i> , Analytics Press: Burlingame.       | <input type="checkbox"/> |
| Further | Quinn, M. J. (2016) <i>Ethics for the Information Age: International Edition</i> , 7 <sup>th</sup> Edition, Pearson: NY | <input type="checkbox"/> |
| Further | Yin, R K, (2013) <i>Case Study Research: Design and Methods</i> , 5 <sup>th</sup> Edition, Sage: Beverly Hills.         | <input type="checkbox"/> |

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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                                                                                   | <input type="checkbox"/>            |
| Essential      | Rian Quinn. Hands-On System Programming with C++: Build performant and concurrent Unix and Linux systems with C++17. 2018, Packt Publishing          | <input type="checkbox"/>            |
| Further        | Balachandar,B. M. RESTful Java Web Services: A pragmatic guide to designing and building RESTful APIs using Java. 2018 3rd Edition, Packt Publishing | <input type="checkbox"/>            |
| Further        | ACM                                                                                                                                                  | <input checked="" type="checkbox"/> |
| Further        | IEEE                                                                                                                                                 | <input checked="" type="checkbox"/> |
| Further        | Computer Networking                                                                                                                                  | <input checked="" type="checkbox"/> |
| Further        | Data Communications                                                                                                                                  | <input checked="" type="checkbox"/> |



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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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                                                                                                                    | <input checked="" type="checkbox"/> |
| Essential      | Thomas, D., Hunt, A., (2019), The Pragmatic Programmer: your journey to mastery, 20th Edition                                                                              | <input checked="" type="checkbox"/> |
| Further        | Gamma, E., Helm, R. Johnson, R., Vlissides, J., (1994), Design patterns : elements of reusable object-oriented software, Addison Wesley                                    | <input checked="" type="checkbox"/> |
| Further        | Martin, R., (2008), Clean Code: A Handbook of Agile Software Craftsmanship, Prentice Hall                                                                                  | <input checked="" type="checkbox"/> |
| 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 | <input checked="" type="checkbox"/> |
| Further        | Sutherland, J., (2015) Scrum: The Art of Doing Twice the Work in Half the Time, Random House Business                                                                      | <input checked="" type="checkbox"/> |
| Further        | Skarin, M., (2015), Real-World Kanban: Do Less, Accomplish More with Lean Thinking, Pragmatic Bookshelf                                                                    | <input checked="" type="checkbox"/> |

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%         |
| <b>TOTAL</b>  | <b>100%</b> |

## INDICATIVE READING LIST

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

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

### **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%          |
| <b>TOTAL</b>         | <b>200</b> | <b>100%</b> |

## 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%          |
| <b>TOTAL</b>  | <b>100%</b> |

## 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        | <input type="checkbox"/> |
| Further        | Rogers Y, Sharp, H, & Preece, J (2015) <i>Interaction Design: Beyond Human-Computer Interaction. 4<sup>th</sup> Edition</i> , John Wiley & Sons, Inc | <input type="checkbox"/> |
| Further        | Lazar, J., Fend, JH and Hochheiser, H (2017) <i>Research Methods in Human-Computer Interaction 2<sup>nd</sup> Edition</i> , Wiley                    | <input type="checkbox"/> |
| Further        | MacKenzie, S. (2014) <i>Human-Computer Interaction: An Empirical Research Perspective</i> , Morgan Kaufmann                                          | <input type="checkbox"/> |
| Further        | BCS Human Computer Interaction Group Proceedings                                                                                                     | <input type="checkbox"/> |

|         |                                                                                                                                                      |                                     |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Further | ACM Publications: Communications, Interactions, SIGCHI                                                                                               | <input type="checkbox"/>            |
| Further | <a href="http://www.usability.gov/">http://www.usability.gov/</a>                                                                                    | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.w3.org/standards/webdesign/accessibility">http://www.w3.org/standards/webdesign/accessibility</a><br>Web accessibility standards | <input checked="" type="checkbox"/> |
| Further | <a href="http://www.nngroup.com/articles/">http://www.nngroup.com/articles/</a> Short usability articles from Jacob Neilson                          | <input checked="" type="checkbox"/> |