

MODULE DIRECTORY

MSc DATA AND ARTIFICIAL INTELLIGENCE

LEVEL 7

ACADEMIC DISCIPLINE OF BIRMINGHAM AND LONDON CAMPUSES

INSTITUTE OF INNER CITY LEARNING

2026-2027

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INTRODUCTION

This Module Directory includes all the modules for Level 7 within the Institute of Inner City Learning in the academic year 2026-2027.

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

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

MODULES

Module Code	ACCA7002
Title	Database Systems
Date	16/08/2018
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- To provide students with a systematic theoretical and practical understanding of the design, implementation and application of database systems. Including more advanced concepts that underpin multi-user database architectures for business applications.

LEARNING OUTCOMES

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

- Apply well-established database analysis and design techniques to critically analyse and implement real-world database application scenarios.
- Critically evaluate selected database methods, tools and techniques and their deployment in a multi-user database environment.

INDICATIVE CONTENT

- Database models (e.g. relational, Object-oriented and Object relational)
- Database design and entity analysis techniques e.g. conceptual, logical and physical database design, entity relationship modelling, normalisation and indexes.
- Structured Query Language (SQL): data definition, data manipulation and data control languages.
- Database security and access control, e.g. database security threats and countermeasures, access control techniques.
- Multi-user database concepts e.g. transaction management, concurrency control and recovery and distributed databases, CAP Theorem.
- Non-SQL database systems and concepts e.g. NoSQL and NewSQL technologies.
- Professional, legal and ethical issues related to data management and data governance.
- Introduction to Big Data Concepts e.g. Hadoop

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		
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

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

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

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

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7002	
Module Title	Database Systems	
Classification	Reading List entry	Electronic*
Essential	Connolly, T., Begg, C., (2015), <i>Database Systems: A Practical Approach to Design, Implementation and Management</i> , 6 th Edition, Pearson (Int)	☒
Essential	Hernandez, M., (2013), <i>Database Design for Mere Mortals: A Hands-on Guide to Relational Database Design 3rd Edition</i> , Addison Wesley	☐
Essential	Hills, T., (2016), <i>NoSQL and SQL Data Modeling: Bringing Together Data, Semantics, and Software</i> , Technics Publications	☒
Further	Dayley, B., (2014), <i>NoSQL with MongoDB in 24 Hours</i> , Sams Teach Yourself, Sams Publishing	☒
Further	Harrison, G., (2015), <i>Next Generation Databases: NoSQL and Big Data</i> , Apress	☒
Further	Sullivan, D., (2015), <i>NoSQL for Mere Mortals</i> , Addison-Wesley Professional	☐
Further	Ricardo, C. M., Urban, S. D. (2015), <i>Databases Illuminated</i> , 3rd Edition, Jones & Bartlett Learning	☐
Further	IEEE Xplore	☒
Further	ACM Transactions	☒

Module Code	ACCA7015
Title	Data Mining and Visualisation
Date	11/04/2019
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- To develop the student's ability to apply suitable statistical and data mining techniques using a variety of supervised and unsupervised data mining methods.

LEARNING OUTCOMES

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

- Apply and justify the application of a range of statistical methods and data mining techniques to the extraction of information from data.
- Critically evaluate the validity of the techniques employed with respect to the relevant data and to their intended use.
- Interpret the intelligence provided by the data mining process within the context of the data set investigated.
- Effectively communicate the data mining process and its results to a decision maker.

INDICATIVE CONTENT

- Data mining methodologies such as CRISP-DM and SEMMA
- Data preparation, visualisation and exploration
- Basic techniques: statistical modelling, decision trees, rulesets, association rules, linear models, regression, instance-based learning, clustering, multi-instance learning, text mining, sentiment analysis
- Credibility of data mining solutions; training and testing, information loss, cost curves; minimum description length principle
- Machine learning; classification, association, perceptrons, numeric prediction, Bayesian networks, semi-supervised and unsupervised learning
- Data transformations; attribute selection, discretisation, projection, sampling, cleansing
- Applications of data mining
- Software tools for data mining

Study Time Allocation

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Presentation	8 minutes	25%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Report	4,500 words	75%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7015	
Module Title	Data Mining and Visualisation	
Classification	Reading List entry	Electronic*
Essential	North, M. (2018) <i>Data Mining for the Masses, 3rd Ed.: With Implementations in RapidMiner and R</i> . CreateSpace Independent Publishing	☒
Essential	Witten, I. H., Frank, E., Hall, M. A. and Pal, C. J. (2016) <i>Data Mining: Practical Machine Learning Tools and Techniques, 4th Edition</i> , Burlington: Morgan Kaufmann	☒
Further	Tuffery, S. (2011) <i>Data Mining and Statistics for Decision Making</i> , Hoboken: Wiley	☒
Further	Kranzler, J.H. (2017) <i>Statistics for the Terrified</i> , Pearson	☒
Further	Few, S. (2012), <i>Show Me The Numbers</i> , Analytics Press, Burlingame, CA.	☒
Further	Websites: http://www.kdnuggets.com/ http://www.kdd.org/	☒

Module Code	ACCA7022
Title	Advanced Statistical Programming
Date	31/07/2020
Level	7
Credits	20
Pre-Requisites	None

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
- Perform data exploration using appropriate visualisation tools.

INDICATIVE CONTENT

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

Study Time Allocation

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

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

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

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

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7022	
Module Title	Advanced Statistical Programming	
Classification	Reading List entry	Electronic*
Essential	Matloff, N. (2013) <i>The Art of R Programming</i> , No Starch Press	☒
Essential	Spiegelhalter, D. (2019) <i>The Art of Statistics: Learning From Data</i> . Pelican Books, Penguin Random House.	☒
Further	Kranzler, J.H. (2010) <i>Statistics for the Terrified</i> , Pearson	☒
Further	Cotton, R (2013) <i>Learning R</i> , O'Reilly	☒
Further	Alvaro, F (2016) <i>R: Easy R Programming for Beginners</i> , Pearson	☒
Further	Spiegel, M.R (2014) <i>Shaum's Outline of Statistics, fifth ed.</i> , McGraw Hill Education Limited	☒
Further	Gonick, L & Smith, W. (2000) <i>Cartoon Guide to Statistics</i> , William Morrow Paperbacks	☒

Module Code	ACCA7025
Title	Application of Machine Learning
Date	31/07/2020
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- To develop in students a systematic understanding of modern machine learning and deep learning principles and practice

LEARNING OUTCOMES

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

- Critically analyse and justify the application of selected machine learning methods and techniques used to solve complex problems.
- Apply and evaluate a range of machine learning methods used to solve given problems
- Analyse given problems and subsequently synthesise and evaluate appropriate solutions using deep learning methods

INDICATIVE CONTENT

- History and Context of ML and Deep Learning
- Machine learning workflows and methodologies
- Datasets, data preparation, feature selection and engineering; training, testing and validation datasets
- Gradient descent, learning rate, loss, stochastic gradient descent
- Generalisation: Underfitting and overfitting, regularisation
- Supervised and unsupervised methods for classification and regression (eg linear regression, polynomial regression, logistic regression, decision trees, SVMs, naïve Bayes, k-means, etc)
- Accuracy, precision and recall, ROC, AUC
- Dimensionality reduction, principle component analysis
- Ensemble Learning
- Neural Networks(NN) and Deep Learning
- Perceptrons, deep neural networks, activation functions
- Training
- Convolutional NN, recurrent NN, autoencoders
- Reinforcement Learning
- Python, virtual environments (eg conda) Scikit-Learn, Pandas, Tensorflow and Keras

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		
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written/programming Assignment	3,000 words equivalent	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written/programming Assignment	3,000 words equivalent	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7025	
Module Title	Application of Machine Learning	
Classification	Reading List entry	Electronic*
Essential	Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow (2 nd edition), O'Reilly	☒
Essential	Goodfellow. I, Bengio. Y, Courville. A and Bach. F (2017), Deep Learning, MIT Press	☒
Further	Burkov, A (2019) The Hundred-Page Machine Learning Book, Burkov, A	☒
Further	Chollet, F. (2017) Deep Learning with Python Paperback , Manning Publications	☒
Further	Russell, S. and Norvig, P. (2009) Artificial Intelligence: A Modern Approach (3rd edition), Prentice Hall	☒
Further	Barber, M. (2012) Bayesian Reasoning and Machine Learning, Cambridge University Press	☒
Further	Bishop, C.M. (2007) Pattern Recognition and Machine Learning, Springer	☐

Module Code	ACCA7026
Title	Artificial Intelligence
Date	31/07/2020
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- To develop the students' ability to solve complex problems using modern AI principles and practice

LEARNING OUTCOMES

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

- Critically analyse, evaluate and justify selected AI methods and techniques used to solve complex problems.
- Analyse given problems and subsequently synthesise and evaluate appropriate solutions using selected AI methods and techniques.

INDICATIVE CONTENT

- Definitions of Strong and Weak AI
- Ethics and Risks of developing AI
- Agent Based Learning
- Problem solving as search: Informed and un-informed search; Global and Local search; Optimisation and constraints
- Population based search: Genetic Algorithms and Particle Swarm Optimisation
- Knowledge representation, reasoning and inference; propositional and predicate logic
- Rule based systems, expert systems, fuzzy logic
- Natural Language Processing
- Perception and Vision: Image processing, object recognition and reconstruction of the 3D world.
- Machine Learning: Supervised, unsupervised methods for classification and regression (eg Decision trees, SVMs, Naïve Bayes, k-means, Neural Networks, etc.)
- Reinforcement Learning

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		
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Assignment	3,000 words	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7026	
Module Title	Artificial Intelligence	
Classification	Reading List entry	Electronic*
Essential	Russell, S. and Norvig, P. (2009) Artificial Intelligence: A Modern Approach (3rd edition), Prentice Hall	☒
Essential	Goodfellow, I; Bengio, Y; Courville, A; Bach, F (2017), Deep Learning, MIT Press	☒
Further	Cormen, T; Leiserson, C; Rivest, R; Stein, C (2009) Introduction to Algorithms (3rd edition), MIT Press	☒
Further	McKinney.W (2017) Python for Data Analysis (2nd edition), O'Reilly	☒
Further	Barber, M. (2012) Bayesian Reasoning and Machine Learning, Cambridge University Press	☒
Further	Bishop, C.M. (2007) Pattern Recognition and Machine Learning, Springer	☐

Module Code	ACCA7028
Title	Data Security, Governance and Compliance
Date	31/07/2020
Level	7
Credits	20
Pre-Requisites	

AIM(S)

- To provide students with sound principles of information systems security, governance and compliance for organisation goals and objectives. They must learn how to support, manage and make effective use of Information Technology (IT) frameworks, models, new regulations and standards of good practice for security management. Student must be able to assess and recognises emerging threats and vulnerability present in existing systems.

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 data security, governance and compliance.
- Consistently apply the principles and practices of data security with skills and experiences to administer and manage the more secure information and communications technology environment that organisations need.

INDICATIVE CONTENT

- Introduction to Management of Information Security.
- The need for Security.
- Compliance: Law and Ethics.
- Governance and Strategic Planning for Security.
- Security Management Models.
- Security Management Practices.
- Planning for Contingencies.
- Information Security Policy.
- Developing the Security Program.
- Risk Management: Identifying and Assessing Risk.
- Risk Management: Controlling Risk.
- Security Maintenance and the Management of Digital Forensics.
- Protection Mechanisms.
- Cryptography.
- Physical Security.
- Implementing Information Security.
- Security and Personnel.
- Information Security Maintenance.
- Intrusion Detection, Prevention Systems and Other Security Technology.
- Access Controls, Firewalls and VPNs.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%

Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

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

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

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

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

Assessment Summary

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

INDICATIVE READING LIST

Module Code	ACCA7028	
Module Title	Data Security, Governance and Compliance	
Classification	Reading List entry	Electronic*
Essential	Management of Information Security 6th Ed by Michael E Whitman, Herbert	☒
Essential	Principles of Information Security 6th Ed by Michael E. Whitman	☒
Further	The Management of Network Security, Technology, Design and Management Control, by Houston, H. Carr, Charles A. SNYDER and Bliss N. Bailey	☐
Further	Cryptography and Network Security: Principles and Practice, Global Edition, 7/E William Stallings	☐
Further	Network Security Essentials: Applications and Standards, Global Edition, 6/E William Stallings	☐
Further	Fundamentals of Information Systems Security, by David Kim and Michael G. Solomon	☐
Further	IEEE/ACM, IEEE/ACM Transactions on Networking	☒
Further	IEEE, IEEE Network Magazine	☒
Further	Science Direct	☒

Module Code	ACFA7003
Title	Masters Project
Date	11/04/2019
Level	7
Credits	60
Pre-Requisites	None

AIM(S)

- To allow the student to advance their knowledge and understanding by undertaking and managing a significant project of their own choice, related to the major themes of their MSc programme.

LEARNING OUTCOMES

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

- critically identify and develop an advanced research topic
- review appropriate literature by contextualising and integrating the study into the continuing development of knowledge and understanding of chosen research topic
- critically formulate a series of research objectives and devise strategies to support these
- demonstrate and display advanced critical, analytic and creative thinking
- demonstrate advanced professional skills to present information both orally and in a written form

INDICATIVE CONTENT

The Masters Project is an essential part of the degree; it is the culmination of the Masters programme. As such, it has been designed and conceived as an integral part of the programme. Preparation for the Masters Project begins early in the programme, and students acquire analytical and other research skills throughout part 1. This underpins and enhances the student's ability to undertake research.

- Formulation and rationale for suitable post-graduate research objectives
- Application of an appropriate methodology for the investigation.
- Collation and communication - recording and organising information, analysis of results, communicating the results, referencing, plagiarism.
- Critical review of appropriate literature within a conceptual/theoretical framework.
- Determination of research results.
- Critical appraisal of the results/solutions of the investigation.
- Project planning - project time scale control
- Oral/visual critique and presentation of the results of the investigation.
- Written and verbal critique of the research
- Intellectual property - copyright, trademarks, patents.
- Social and cultural context, and ethical issues
- Intellectual property - copyright, trademarks, patents.
- Social and cultural context, and ethical issues

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
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Scheduled learning	15	2.5%
Independent learning	585	97.5%
Placement learning	0	0%
TOTAL	600	100%

ASSESSMENT

Assessment Component 1

☐	Written exam	☒	Coursework	☐	Practical
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Mode of assessment	Volume	Weighting
Masters Project	15,000 words equivalent Students will produce a research portfolio of work appropriate to the nature of their project. This will vary slightly according to the nature of the project undertaken. Portfolio elements may include a selection of the following, to be agreed with the external examiner: • Written Report (all students) • Exhibition Board (all students) • Presentation slides • Hardware and/or software implementation	80%

Assessment Component 2

☐	Written exam	☐	Coursework	☒	Practical
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Mode of assessment	Volume	Weighting
Viva voce	15 mins (before questions)	20%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	80%
Practical	20%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACFA7003	
Module Title	Masters Project	
Classification	Reading List entry	Electronic *
Essential	McCormac, C. and Davis, J. (2015) <i>Research Project Success: The Essential Guide for Science</i>	☒

	<i>and Engineering Students</i> , Cambridge: Royal Society of Chemistry	
Essential	Greenfield, T. (2016) <i>Research Methods for Postgraduates</i> , London: Arnold	☒
Essential	Cottrell, S. (2011) <i>Critical Thinking Skills: Developing Effective Analysis and Argument - Palgrave Study Guides, 2nd Edition</i> , London: Palgrave Macmillan	☒
Essential	Cottrell, S. <i>Dissertations and Project Reports: A Step by Step Guide</i> (Palgrave Study Skills, 2014)	☒
Essential	O'Leary, Z. (2013) <i>Doing Your Research Project (2nd Edition)</i> , SAGE Publications Ltd	☒
Further	O'Leary, Z. (2015) <i>The Essential Guide to Doing Your Research Project</i> , Newcastle upon Tyne: Sage	☒
Further	Kranzler, J. H. (2017) <i>Statistics for the Terrified</i> , Upper Saddle River: Prentice Hall	☒
Further	Dawson, C. W. (2009) <i>Projects in Computing and Information Systems: a Student's Guide, 2nd Edition</i> , Boston: Addison-Wesley	☒
Further	Dipankar, D. (2019) <i>Engineering Research Methodology: A Practical Insight for Researchers</i> . Springer	☐
Further	Fellows, R. and Liu, A. <i>Research Methods for Construction</i> (Blackwell Oxford, 2015)	☐
Further	Few, S. (2012) <i>Show Me the Numbers</i> , Burlingame: Analytics Press	☒
Further	Hughes, B. and Cotterell, M. (2009) <i>5th Software Project Management</i> , New York: McGraw-Hill	☐
Further	Phillips, J. (2010) <i>IT Project Management: On Track from Start to Finish</i> , New York: McGraw-Hill	☐
Further	Gregoire, T.G. & Valentine, H.T. (2008) <i>Sampling strategies for natural resources and the environment</i> . Chapman, London	☐
Further	Baase, S. (2012) <i>A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet: International Edition, 4th Edition</i> , Boston: Pearson	☐
Further	Collis, J. and Hussey, R. (2009) <i>Business Research: a Practical Guide for Undergraduate and Postgraduate Students</i> , 3rd Edition, London: Palgrave Macmillan	☐
Further	Cottrell, S. (2011) <i>Critical Thinking Skills: Developing Effective Analysis and Argument - Palgrave Study Guides, 2nd Edition</i> , London: Palgrave Macmillan	☐
Further	Davies, M. B. (2007) <i>Doing a Successful Research Project</i> , London: Palgrave Macmillan	☐
Further	Dawson, C. W. (2009) <i>Projects in Computing and Information Systems: a Student's Guide</i> , 2nd Edition, Boston: Addison-Wesley	☐
Further	Hewson, C. , Vogel, C. & Laurent, D. (2015) <i>Internet research methods</i> . Sage: London.	☐

Further	Few, S. (2012) Show Me the Numbers: Designing Tables and Graphs to Enlighten, Burlingame: Analytics Press	☐
Further	Quinn, M. J. (2010) Ethics for the Information Age: International Edition - 4th Edition, Boston: Pearson	☐
Further	Yin, R. K. (2008) Case Study Research: Design and Methods, 4th Edition, Newcastle upon Tyne: Sage	☐
Further	Spence, R. (2014) <i>Information Visualization: an Introduction</i> , Boston: Addison-Wesley	☐
Further	Thiel, D.V. (2014) Research methods for engineers. Cambridge UP	☒
Further	Wheater, C.P. & Cook, P.A. (2015) Using statistics to understand the environment Routledge	☐
Further	Journals ACM Transactions on Information Systems Behaviour and Information Technology Communications on the ACM International Journal of Electronic Commerce Journal of Strategic Information Systems Journal of Systems Management	☒
Further	Websites http://www.acm.org http://www.bized.co.uk http://www.managers.org.uk http://www.cbronline.com http://www.eevl.ac.uk http://juno.emeraldinsight.com http://www.ft.chadwyck.co.uk http://www.itwales.com http://www3.gartner.com http://www.silicon.com http://www.mckinseyquarterly.com http://www.zdnetweek.co.uk http://projectmanagement.ittoolbox.com/ http://www.ics.ltsn.ac.uk/resources/projman/index.html http://www.niwotridge.com/Resources/PM-SWEResources/PMResources.htm http://www.tickit.org/international.htm http://www.bcs.org/ http://www.uml.org/ http://www.omg.org/	☒

Module Code	ACFA7004
Title	Research Methods and Professional Development
Date	11/04/2019
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- The aim of this module is for students to develop a problem solving approach to research to facilitate their production of a valid and reliable postgraduate dissertation.

LEARNING OUTCOMES

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

- Generate a project proposal that meets a given domain research requirements.
- Identify and visualise a complex research problem within a specific research domain, outline the investigative approach and comprehensively consider appropriate methods and solutions.
- Critically appraise the research process and its outcomes.

INDICATIVE CONTENT

- Core lectures on the principles of postgraduate research :
 - Research principles and approaches (e.g. the research process, purpose, sources of data including primary/secondary research, quantitative/qualitative data, objective/hypothesis formation, reliability, validity)
 - Research methodologies - historical, descriptive, correlational, comparative, experimental
 - Field data - survey design, questionnaires, sampling, statistical techniques, interviews, case studies, observation
 - Developing a proposal - research statement, research outline and design research schedule
 - Project planning - project time scale control
 - Intellectual property - copyright, trademarks, patents
 - Social and cultural context, and ethical considerations
- Writing up and publishing
- Domain specific research methods:
 - Research for engineering
 - Project planning for computing
 - Advanced Quantitative research methods
 - Advanced Qualitative research methods

Study Time Allocation

The study time for the module is divided as follows:

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

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Research Proposal	4,000 words	70%

Assessment Component 2

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Presentation	10 mins (plus questions)	30%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	70%
Practical	30%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACFA7004	
Module Title	Research Methods and Professional Development	
Classification	Reading List entry	Electronic*
Essential	Cottrell, S. (2011) Critical Thinking Skills: Developing Effective Analysis and Argument - Palgrave Study Guides, 2 nd Edition, London: Palgrave Macmillan	☒
Essential	Cottrell, S. (2014) Dissertations and Project Reports: A Step by Step Guide, Palgrave Study Skills	☒
Essential	O'Leary, Z. (2013) Doing Your Research Project (2 nd Edition), SAGE Publications Ltd	☒
Further	Dawson, C. W. (2009) Projects in Computing and Information Systems: a Student's Guide, 2 nd Edition, Boston: Addison-Wesley	☒
Further	Dipankar, D. (2019) Engineering Research Methodology: A Practical Insight for Researchers. Springer	☐
Further	Fellows, R. and Liu, A. (2015) Research Methods for Construction, Oxford: Blackwell	
Further	Few, S. (2012) Show Me the Numbers, Burlingame: Analytics Press	☐

Further	Gregoire, T.G. & Valentine, H.T. (2008) Sampling strategies for natural resources and the environment. London : Chapman	☐
Further	Hart, C. (1998) Doing a Literature Review, Sage	☒
Further	Hewson, C., Vogel, C. & Laurent, D. (2015) Internet research methods. London: Sage	☐
Further	Kranzler, J. H. (2011) Statistics for the Terrified, 5 th Edition, Upper Saddle River: Prentice Hall	☐
Further	Leedy. P. D. and Ormrod, J. E. (2012) Practical Research Planning and Design, 10 th Edition, Boston: Pearson Education	☒
Further	Maylor, H. (2010) Project Management, Boston: Pearson Education	☐
Further	Oppenheim, A. (1992) Questionnaire Design, Interviewing and Attitude Measurement, London: Continuum	☒
Further	Spence, R. (2014) Information Visualization: an Introduction, Boston: Addison-Wesley	
Further	Thiel, D.V. (2014) Research Methods for Engineers. Cambridge UP	☒
Further	Wheater, C.P. & Cook, P.A. (2015) Using Statistics to Understand the Environment, Routledge	☒