



ARCL0160 (was *ARCLG338*)
Archaeological Data Science

2018-19

**15 credits
Fridays 11-1
Term I**

Co-ordinator: Mark Lake (with Andy Bevan)
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Room 115, Tel: 020 7679 71535 (Internal: 21535)

Coursework deadlines: 25/10, 15/11, 6/12, 17/1

Moodle site: <https://moodle-1819.ucl.ac.uk/course/view.php?id=392>

Turnitin: Use link on Moodle site

1 OVERVIEW

Short description

This course introduces principles of information and data science and its application to archaeology. The areas covered include basic principles of computer languages and scripts, database management and design, web science and design, data mining, crowdsourcing, and 3D modelling. All of these will also reinforce computational methodologies in addressing archaeological problems. The course is intended to provide a basic understanding in core principles and practical application on how emerging technologies and methods can be applied to archaeological problems. The course practically oriented and is intended to give students skills that allow them to apply computational methods for their own research and professional interests.

Week-by-week summary

(Thursdays 10:00-13:00, Term I in room 322C)

4 October 2018 Session 1 M. Lake
Introduction
Introduction to Programming

11 October 2018 Session 2 M. Lake
Scripts
Interacting with the operating system

18 October 2018 Session 3 M. Lake
Understanding Object-Oriented Programming
Designing Programmes

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|---------------------------------------|--------------|----------|
| 25 October 2018 | Session 4 | M. Lake |
| Polyglot and Multi-Paradigm Computing | | |
| Data Mining | | |
| 1 November 2018 | Session 5 | M. Lake |
| Databases | | |
| Data Mining | | |
| 8 November 2018 | READING WEEK | |
| 15 November 2018 | Session 6 | M. Lake |
| Introduction to Web Science | | |
| Web/Document Scraping | | |
| 22 November 2018 | Session 7 | M. Lake |
| Databases and Web Design | | |
| 29 November 2018 | Session 8 | A. Bevan |
| Crowdsourcing | | |
| 6 December 2018 | Session 9 | A. Bevan |
| Introduction to Photogrammetry | | |
| 13 December 2018 | Session 10 | A. Bevan |
| Photogrammetry 2 | | |

Assessment deadlines

Assignment 1 due date: **25th October, 2018**

Assignment 2 due date: **15th November, 2018**

Assignment 3 due date: **6th December, 2018**

Project due date: **17th January, 2019**

I will endeavour to return the first three assignments one week after they were submitted (subject to class size).

Methods of assessment

This course is assessed by three short assignments (60% of the total mark) and one research project (40%).

Three short assignments:

- (a) *The three* pieces of coursework will be posted on Moodle, with each being 450-550 words, which each contribute 20% to the final grade for the course.
- (b) These assignments are evaluated by 1) how well you employ your work to accomplish the specified task, 2) how well you commented and understood what you were doing, 3) how easily your work is portable and works on different computers, 4) how well you use concepts discussed in class.

Research project:

- (a) A research project with between 3,325-3,675 words.
- (b) The criteria is the same as the assignments and you must be able to demonstrate that your project can address a useful archaeological problem.

Note: all assignments are likely to include coding. Details will be discussed in class, as code should be submitted for evaluation.

Teaching methods

The course is taught through one hour lectures/seminars and one hour of hands on practical lessons during class. Each week will include presentations on concepts and presentation of examples that demonstrate concepts. In addition, students are expected to spend time outside of class to review materials and practice coding.

Workload

Total work will constitute about 150 hours. This includes 20 hours for lectures, 20 for reading, 20 for additional work on practicals, and 90 hours for assignment preparation.

2 AIMS, OBJECTIVES AND ASSESSMENT

Aims

The aim is to introduce students to key concepts in data/information science as it applies to archaeology. With increased use of technologies and increasing availability of data and data repositories, archaeologists need techniques and methods to understand how to promote their work in a modern format to other researchers and the public, while also utilizing information to make new and deeper understanding into archaeological problems. This includes being aware of current technical tools that are available as well as having abilities to customize tools to solve problems of interest.

Objectives

On successful completion of this course a student should:

- Understand basic software and computer science applications
- Recognise how to configure and create tools for research needs
- Be able to apply tools to archaeological problems
- Be familiar with different computing methods that can be created for various research problems

Learning Outcomes

On successful completion of the course students should be able to demonstrate/have developed:

- A basic understanding of fundamentals in data management, scripts and software creation, web applications, photogrammetry, 3D modelling, and other computational skills
- Be able to create a basic design and practical implementation of software and technical approaches to archaeological problems

The three assignments provide assessment of the core skills taught. The research project allow students to think creatively and apply skills to a research problem specific to their interests or of relevance.

3 COURSEWORK

Assessment tasks

Assignment 1: This will look at basic object-oriented coding practices covered in class. The exact assignment will be posted on Moodle.

Assignment 2: This will look at database and data management and data mining techniques. The assignment will be posted on Moodle.

Assignment 3: This assignment covers the creation and placement of images on websites. The assignment will be posted on Moodle.

Project: For the project, I want you to choose an archaeological topic and choose an appropriate set of methods covered in class. These methods should at least cover one or more topics, including: databases, web scraping, website creation, photogrammetry, 3D modelling, and/or crowdsourcing.

These assignments may require you to include illustrations, such as maps and graphs. Please ensure that these are carefully presented. General guidance is available on the IoA Student Administration Moodle pages at <https://moodle-1819.ucl.ac.uk/course/view.php?id=9992>. All illustrations should have informative captions. Where appropriate, maps should include indicators of scale and orientation, as well as a legend (key) based on sensible ranges of data values. Graphs should include informative labels for the X- and Y-axes.

Due dates for all assignments and project are listed above. **Please note that in order to be deemed to have completed and passed in any module, it is necessary to submit all assessments.**

If students are unclear about the nature of an assignment, they should discuss this with the Course Co-ordinator. Students are not permitted to re-write and re-submit essays in order to try to improve their marks. However, students may be permitted, in advance of the deadline for a given assignment, to submit for comment a brief outline of the assignment. The Course Co-ordinator is willing to discuss an outline of the student's approach to the assignment, provided this is planned suitably in advance of the submission date.

Word counts

The following should not be included in the word-count: title page, contents pages, lists of figure and tables, abstract, preface, acknowledgements, bibliography, lists of references, captions and contents of tables and figures, appendices.

Penalties will only be imposed if you exceed the upper figure in the range specified. There is no penalty for using fewer words than the lower figure in the range: the lower figure is simply for your guidance to indicate the sort of length that is expected.

In the 2018-19 session penalties for overlength work will be as follows:

- For work that exceeds the specified maximum length by less than 10% the mark will be reduced by five percentage marks, but the penalised mark will not be reduced below the pass mark, assuming the work merited a Pass.
- For work that exceeds the specified maximum length by 10% or more the mark will be reduced by ten percentage marks, but the penalised mark will not be reduced below the pass mark, assuming the work merited a Pass.

Coursework submission procedures

All coursework must normally be submitted both as hard copy and electronically.

You should staple the appropriate colour-coded IoA coversheet (available in the IoA library and outside room 411a) to the front of each piece of work and submit it to the red box at the Reception Desk.

All coursework should be uploaded to Turnitin by midnight on the day of the deadline. This will date-stamp your work. It is essential to upload all parts of your work as this is sometimes the version that will be marked. Instructions will be given in class as the Turnitin inboxes for this course are accessed via its Moodle pages.

If you have problems, please email the IoA Turnitin Advisers on ioa-turnitin@ucl.ac.uk, explaining the nature of the problem and the exact module and assignment involved. One of the Turnitin Advisers will normally respond within 24 hours, Monday-Friday during term. Please be sure to email the Turnitin Advisers if technical problems prevent you from uploading work in time to meet a submission deadline - even if you do not obtain an immediate response from one of the Advisers they will be able to notify the relevant Module Coordinator that you had attempted to submit the work before the deadline

3 SYLLABUS

Week 1

Introduction

Introduction to Programming

Mark Lake

Summary: Basic concepts of modern computing and computer programming are given, including variables, methods, loops, and logical structures. The idea will also be to introduce students to the basics of Python as a language utilizing the concepts introduced. These skills will be foundational to skillsets taught in this and other courses where programming is central.

Readings

Concepts of Computing

Essential:

Liang, Y. Daniel. 2013. *Introduction to Programming Using Python*. Boston: Pearson. Chapters 1.6-6.
See: <https://haseebsohail.files.wordpress.com/2013/02/introduction-to-programming-using-python-y-liang-pearson-2013-ww.pdf>

Suggested:

Nash, Fahiemah, Angela Du Preez, and Conrad De Wet. 2009. *Computer Programming*.

Tucker, Allen B., Teofilo F. Gonzalez, and Jorge L. Diaz-Herrera, eds. 2014. *Computing Handbook*. Third edition. Boca Raton: CRC Press, Taylor & Francis Group. Topic 1.

Python Resources

<https://docs.python.org/3/tutorial/>

<http://www.pythontutorial.net/> (Chapters 2-6)

<https://www.python.org/about/gettingstarted/>

<https://developers.google.com/edu/python/>

<https://www.codecademy.com/learn/python>

As a registered student of UCL you have access to short video courses on Lynda, available from <https://www.ucl.ac.uk/lynda>. For example, once logged in to Lynda, search for *Learning Python* with Joe Marini.

Week 2

Writing scripts

Interacting with the operating system

Mark Lake

Summary: Building on the fundamentals of the Python taught in the previous week, we now investigate how to create Python scripts that can read and write files and harness the utility of other installed programs. Scripts are often fairly simple and therefore frequently (although not necessarily) procedural in nature rather than object oriented. They are useful for solving all kinds of problems encountered in computational archaeology, particularly what one might call data ‘housekeeping’, for example sorting and renaming files, converting file formats, etc.

Readings

As the previous work.

You might also familiarise yourself with the purpose of Exiftool
(<https://www.sno.phy.queensu.ca/~phil/exiftool/>)

Week 3

Understanding Object-Oriented Programming Designing Programmes

Mark Lake

Summary: Taking the lessons from the previous two weeks, we now begin to explore how to use object-oriented frameworks to create simple to more complex computing tasks. To support this we switch to a more sophisticated development environment. We also go over the principal of designing computer programs. This will include documentation, modular design, and using flow charts to describe programs.

Readings

Computer Program Design

Essential:

<https://scotch.io/bar-talk/s-o-l-i-d-the-first-five-principles-of-object-oriented-design>

Suggested:

Object Oriented Programming

Farrell, Joyce. 2008. *Programming Logic and Design: Comprehensive*. 7th ed. Boston, Mass: Thomson Course Technology. Chapters 10-11.

Üçoluk, Göktürk, and Sinan Kalkan. 2012. *Introduction to Programming Concepts with Case Studies in Python*. Wien ; New York: Springer. Pp. 21-28.

Phillips, Dusty. 2010. *Python 3 Object Oriented Programming: Harness the Power of Python 3 Objects*. Community Experience Distilled. Birmingham: Packt Publ. Chapters 1-5

Python

http://anandology.com/python-practice-book/object_oriented_programming.html

Week 4

Polyglot and Multi-Paradigm Computing

Mark Lake

Summary: This week introduces concepts in polyglot and multi-paradigm computing. The intent is to help create programmes with multiple languages (e.g., Python and R) or different paradigms (e.g., object-oriented, procedural programming, etc.). This allows us to harness other programs and their capabilities as well as create potentially more extensive software for applications, taking advantage of the strengths of each approach or platform.

Readings

Multi-paradigm Computing

Required:

Multi-paradigm Computing

See: The Role of Programming Paradigms in the First Programming Courses:

<http://elib.mi.sanu.ac.rs/files/journals/tm/21/tm1122.pdf>

Polyglot Programming

Nowak, Robert M. 2014. “Polyglot Programming in Applications Used for Genetic Data Analysis.” *BioMed Research International* 2014: 1–7. doi:10.1155/2014/253013.

Suggested:

Multi-paradigm Computing

Üçoluk, Göktürk, and Sinan Kalkan. 2012. *Introduction to Programming Concepts with Case Studies in Python*. Wien ; New York: Springer. Pp. 7-12.

Hofstedt, Petra. 2011. *Multiparadigm Constraint Programming Languages*. Cognitive Technologies. Heidelberg ; New York: Springer. Parts 3-5.

Polyglot Programming

Turnquist, Greg Lee. 2010. *Spring Python 1.1: Create Powerful and Versatile Spring Python Applications Using Pragmatic Libraries and Useful Abstractions*. Community Experience Distilled. Birmingham: Packt Publ. (Read Chapter 10 as an example, earlier chapters as needed).

Polyglot in Python with R

http://rpy2.readthedocs.org/en/version_2.7.x/

Polyglot in Python and java

<http://www.jython.org/>

Week 5

Databases
Data Mining

Mark Lake

Summary: This week introduces different types of databases and data mining techniques. This includes NoSQL- and SQL-based or relational databases. Data mining techniques commonly used, including classification, clustering, statistical, and artificial intelligence techniques are introduced.

Readings

Relational Databases

Garcia-Molina, H. et al. 2009. *Database Systems: The Complete Book*.
http://people.inf.elte.hu/nikovits/DB2/Ullman_The_Complete_Book.pdf (Chapters 5-10).

Required:

Date, Chris J., and Hugh Darwen. 2007. *Databases, Types, and the Relational Model: The Third Manifesto*. 3. ed. Reading, Mass.: Addison-Wesley. Chapters 1-3, 5.

NoSQL Databases

Dayley, Brad. 2015. *Sams Teach Yourself NoSQL with MongoDB in 24 Hours*. Indianapolis, Ind.: Sams.

Data Mining

Cios, Krzysztof J., Witold Pedrycz, and Roman Świdnicki. 1998. *Data Mining Methods for Knowledge Discovery*. The Kluwer International Series in Engineering and Computer Science, SECS 458. Boston: Kluwer Academic. Chapters 2-3.

Suggested:

NoSQL Databases

Sadalage, Pramod J., and Martin Fowler. 2013. *NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence*. Upper Saddle River, NJ: Addison-Wesley. Chapters 1-4, 7.

General Scientific Background

Hey, A. J. G. (Ed.). 2009. *The Fourth Paradigm: Data-Intensive Scientific Discovery*. Redmond, Washington: Microsoft Research.

Data Mining:

Cacciatore, Stefano ; Luchinat, Claudio ; Tenori, Leonardo. 2014. **Knowledge discovery** by accuracy maximization. *Proceedings of the National Academy of Sciences of the United States of America* 111(14): 5117-22.

Databases

<https://www.mysql.com/>
<https://www.sqlite.org/>
<https://www.mongodb.com/>

Week 6

Introduction to Web Science
Web/Document Scraping

Mark Lake

Summary: This week we begin to look at web science today and how it impacts archaeology and web development. The focus will be on document scraping methods (both web pages and PDF files) for finding relevant documents and extracting key texts for further analysis from structured and unstructured data. The skills learned this week will allow you to potentially search and extract information from academic and other sources of information.

Readings

Introduction to Web Science

Required:

Ackland, Robert. 2013. *Web Social Science: Concepts, Data and Tools for Social Scientists in the Digital Age*. Los Angeles: SAGE.

Web/Document Scraping

Mitchell, Ryan. 2015. *Web Scraping with Python: Collecting Data from the Modern Web*. First Edition. Sebastopol, CA: O'Reilly Media. Chapters 1-4, 6.

Web scraping tools:

<http://scrapy.org/>
<https://www.crummy.com/software/BeautifulSoup/bs4/doc/>

Week 7

Databases and Web Design

Mark Lake

Summary: This week we begin to look at web design and modern web pages, including their design and interface with mobile phones. We will look at the use of web design (as a way to encourage more interactive and dynamic sites. We also introduce how designs can be developed using new software and skillsets already learned; HTML 5 and CSS will be introduced, with JavaScript and Python tools introduced.

Reading

Web Design

Required:

Grinberg, Miguel. 2014. *Flask Web Development*. First edition. Sebastopol, CA: O'Reilly.

Suggested:

Frain, Ben. 2012. *Responsive Web Design with HTML5 and CSS3: Learn Responsive Design Using HTML5 and CSS3 to Adapt Websites to Any Browser or Screen Size*. Community Experience Distilled. Birmingham: Packt Publ. Chapter 1-4.

Simmons, Cory. 2013. *Instant Responsive Web Design Learn the Important Components of Responsive Web Design and Make Your Websites Mobile-Friendly*. Birmingham, UK: Packt Pub.

Web Development Tools:

<https://realpython.com/blog/python/flask-by-example-part-1-project-setup/>
<http://jinja.pocoo.org/>

Week 9

Crowdsourcing

Andrew Bevan

Summary: We introduce the concept of crowdsourcing and how it has increasingly been used for information management, ideation processes and funding in the humanities. We also consider how it has been applied to archaeology specifically, while learning some basic tools that can be used to create new open data and/or enhance existing ones, and to evaluate volunteer contributions and their value to individuals and organisations in contemporary society.

Reading

Bevan, A., Pett, D., Bonacchi, C., Keinan-Schoonbaert, A., Lombraña González, D., Sparks, R., Wexler, J. and Wilkin, N. 2014. Citizen Archaeologists. Online Collaborative Research about the Human Past. *Human Computation* (2014) 1:2:183-197.

Bonacchi, C., Bevan, A., Pett, D., Keinan-Schoonbaert, A. 2015 Crowd- and Community-fuelled Archaeology. Early Results from the MicroPasts Project. In Giligny, F., Djindjian, F., Costa, L., Moscati, P. and Robert, S. eds. CAA2014, 21st Century Archaeology. Concepts, Methods and Tools. Proceedings of the 42nd Annual Conference on Computer Applications and Quantitative Methods in Archaeology, Paris. Oxford: Archaeopress, pp. 279-288.

Li, Wei, Michael N. Huhns, Wei-Tek Tsai, and Wenjun Wu, eds. 2015. *Crowdsourcing: Cloud-Based Software Development*. Progress in IS. Berlin: Springer. pp. 1-73.

Terras, M. 2016. Crowdsourcing in the Digital Humanities. In Schreibman, S., Siemens, R., and Unsworth, J. Eds. *A New Companion to Digital Humanities*. Chichester: John Wiley & Sons Inc., pp. 420-438.

Crowdsourcing Tools:

<http://pybossa.com/>
<https://github.com/nytlabs/hive>
<https://github.com/MicroPasts>

Week 9

Introduction to photogrammetry

Andy Bevan

Summary: This week provides an introduction to photogrammetry as applied at a range of archaeological scales. We will consider basic photographic strategy and model construction.

Reading

Required:

Luhmann, T. and Robson, S. 2011. *Close Range Photogrammetry Principles, Methods and Applications*. Dunbeath: Whittles Publishing. Chapters 1-7.

Ducke, Benjamin, David Score, and Joseph Reeves. 2011. “Multiview 3D Reconstruction of the Archaeological Site at Weymouth from Image Series.” *Computers & Graphics* 35 (2): 375–82.

Andrew Bevan, Xiuzhen Li, Marcos Martinon-Torres, Susan Green, Yin Xia, khun Zhao, Zhen Zhao, Shengtao Ma, Wei Cao and Thilo Rehren. 2014. Computer vision, archaeological classification and China's terracotta warriors. *Journal of Archaeological Science* 49: 249-254.

Week 10

Photogrammetry 2

Andy Bevan

Summary: This week we look at complete workflows for the construction of high quality 3D objects and the particular challenges faced by archaeological applications.

Reading

Required:

De Reu, Jeroen, Gertjan Plets, Geert Verhoeven, Philippe De Smedt, Machteld Bats, Bart Cherretté, Wouter De Maeyer, et al. 2013. “Towards a Three-Dimensional Cost-Effective Registration of the Archaeological Heritage.” *Journal of Archaeological Science* 40 (2): 1108-1121.

Kersten, Thomas P., and Maren Lindstaedt. 2012. “Image-Based Low-Cost Systems for Automatic 3D Recording and Modelling of Archaeological Finds and Objects.” In *Progress in Cultural Heritage Preservation*, edited by Marinos Ioannides, Dieter Fritsch, Johanna Leissner, Rob Davies, Fabio Remondino, and Rossella Caffo, 7616:1–10. Berlin, Heidelberg: Springer Berlin Heidelberg.

4 ONLINE RESOURCES

The Moodle site for this course is at <https://moodle-1819.ucl.ac.uk/course/view.php?id=392>.
The Institute of Archaeology coursework guidelines can be found at <https://moodle-1819.ucl.ac.uk/course/view.php?id=9992>.

Many other resources have been included in the syllabus notes.

5 ADDITIONAL INFORMATION

Libraries and other resources

In addition to the Library of the Institute of Archaeology, other libraries in UCL with holdings of particular relevance to this degree are the DMS Watson Science Library.

Attendance

A register will be taken at each class. If you are unable to attend a class, please notify the lecturer by email. Departments are required to report each student's attendance to UCL Registry at frequent intervals throughout each term. You are expected to attend at least 70% of classes.

Information for intercollegiate and interdepartmental students

Students enrolled in Departments outside the Institute should obtain the Institute's coursework guidelines from Judy Medrington (j.medrington@ucl.ac.uk), which will also be available on Moodle.

Health and safety

Students enrolled on this course are particularly reminded of the measures that should be taken to reduce possible discomfort arising from the extended use of computer workstations. UCL's occupational health centre provides some information at: http://www.ucl.ac.uk/hr/occ_health/health_advice/office_guide.php.

Dyslexia

If you have dyslexia or any other disability, please make your lecturers aware of this. Please discuss with your lecturers whether there is any way in which they can help you. Students with dyslexia are reminded to indicate this on each piece of coursework.

Feedback

In trying to make this course as effective as possible, we welcome feedback from students during the course of the year. All students are asked to give their views on the course in an anonymous questionnaire which will be circulated at one of the last sessions of the course. These questionnaires are taken seriously and help the Course Co-ordinator to develop the course. The summarised responses are considered by the Institute's Staff-Student Consultative Committee, Teaching Committee, and by the Faculty Teaching Committee.

If you are concerned about any aspect of this course we hope you will feel able to talk to the Course Co-ordinator, but if you feel this is not appropriate, you should consult your Personal Tutor, the Academic Administrator (Judy Medrington), or the Chair of Teaching Committee (Dr. Bill Sillar).

APPENDIX A: POLICIES AND PROCEDURES 2018-19(PLEASE READ CAREFULLY)

This appendix provides a short précis of policies and procedures relating to modules. It is not a substitute for the full documentation, with which all students should become familiar. For full information on Institute policies and procedures, see the IoA Student Administration section of Moodle: <https://moodle.ucl.ac.uk/module/view.php?id=40867>

For UCL policies and procedures, see the Academic Regulations and the UCL Academic Manual: <http://www.ucl.ac.uk/srs/academic-regulations>; <http://www.ucl.ac.uk/academic-manual/>

GENERAL MATTERS

ATTENDANCE: A register will be taken at each class. **If you are unable to attend a class, please notify the lecturer by email.**

DYSLEXIA: If you have dyslexia or any other disability, please discuss with your lecturers whether there is any way in which they can help you. Students with dyslexia should indicate it on each coursework cover sheet.

COURSEWORK

LATE SUBMISSION: Late submission will be penalized in accordance with current UCL regulations, unless formal permission for late submission has been granted.

The UCL penalties are as follows:

- ← The marks for coursework received up to two working days after the published date and time will incur a 10 percentage point deduction in marks (but no lower than the pass mark).
- ← The marks for coursework received more than two working days and up to five working days after the published date and time will receive no more than the pass mark (40% for UG modules, 50% for PGT modules).
- ← Work submitted more than five working days after the published date and time, but before the second week of the third term will receive a mark of zero but will be considered complete.

GRANTING OF EXTENSIONS: Please note that there are strict UCL-wide regulations with regard to the granting of extensions for coursework. You are reminded that Module Co-ordinators are not permitted to grant extensions. All requests for extensions must be submitted on the appropriate UCL form, together with supporting documentation, via Judy Medrington's office and will then be referred on for consideration. Please be aware that the grounds that are acceptable are limited. Those with long-term difficulties should contact UCL Student Disability Services to make special arrangements. Please see the IoA website for further information. Additional information is given here

<http://www.ucl.ac.uk/srs/academic-manual/c4/extenuating-circumstances/>

RETURN OF COURSEWORK AND RESUBMISSION: You should receive your marked coursework within one month of the submission deadline. If you do not receive your work within this period, or a written explanation, notify the Academic Administrator. When your marked essay is returned to you, return it to the Module Co-ordinator within two weeks. You must retain a copy of all coursework submitted.

CITING OF SOURCES and AVOIDING PLAGIARISM: Coursework must be expressed in your own words, citing the exact source (**author, date and page number; website address if applicable**) of any ideas, information, diagrams, etc., that are taken from the work of others. This applies to all media (books, articles, websites, images, figures, etc.). **Any direct quotations from the work of others must be indicated as such by being placed between quotation marks.** Plagiarism is a very serious irregularity, which can carry heavy penalties. It is your responsibility to abide by requirements for presentation, referencing and avoidance of plagiarism. Make sure you understand definitions of plagiarism and the procedures and penalties as detailed in UCL regulations: <http://www.ucl.ac.uk/current-students/guidelines/plagiarism>.

RESOURCES

MOODLE: Please ensure you are signed up to the module on Moodle. For help with Moodle, please contact Charlotte Frearson (c.frearson@ucl.ac.uk).