Coordinator

Mr Kevin Swingler, Big Data course director

Credits

60 credits at SCQF level 11

Prerequisites

- Completion of the Autumn and Spring semester taught modules
- Submission of a project proposal countersigned by the proposed supervisor

Learning outcomes

The project gives students the opportunity to develop:
- the ability to conduct a substantial and largely independent piece of work
- the facility to document and present such work
- an understanding of investigation and design methods

Students will be able to:
- act as computing professionals in their future careers
- discuss their work in depth with peers
- give written presentations of their work

Transferable Skills

- the ability to undertake a substantial supervised project
- an understanding of investigation and design methods
- verbal and written communication skills

Contents

The project is mandatory for students wishing to graduate with the MSc in Big Data. It occupies three months of full time study following the two semesters of taught modules. Project work is important for a number of reasons. It requires the use of previously acquired skills and knowledge, increasing the grasp of these, and giving the opportunity to develop them further. It is also important to develop the ability to communicate ideas effectively. Planning and organisation of time is essential since the project is a substantial and time-limited piece of work.

The project topic must be approved by the Course Director. The project will be supervised by a member of the Division's staff, and will therefore be agreed with the supervisor. Throughout the project it is necessary to maintain regular contact with the supervisor. Usually this will mean a meeting every week or two.

Detailed guidance is provided in an Appendix of the MSc course Student Handbook (and is also available via the MSc projects Web page, see below).

Project

The project work undertaken must be a *practical, problem solving project,* involving a *substantial computing element*. This may be to develop some kind of software system, or to use existing Big Data technologies to perform a new task or achieve a certain goal. The project must aim to solve a realistic problem in a systematic manner. The problem should be realistic in the sense that it is not a "toy" problem artificially created for the project, but instead addresses a (potential) real requirement in reasonable breadth and depth. The project should avoid re-inventing the wheel, i.e. tackling problems with well-known or readily available solutions. The approach should be systematic in that it applies the systems and software engineering skills learned during the course. The project will need clear goals and well-defined beneficiaries: who could use the results and how they might gain from them. You should formulate and execute the project like a real development. You should therefore consider your project's life-cycle, including requirements definition, high-level design, low-level design and testing. If appropriate you should think about acceptance testing, and normally the project and dissertation will include evaluation by potential end-users. The project should demonstrate your competence as a computing professional. You should therefore consider ethical issues (e.g. respecting confidences of a company you work with), legal issues (e.g. Intellectual Property Rights in the results), security issues (such as protection against SQL injection attacks, encryption of stored passwords), and social issues (e.g. how errors in your project work might affect others, or how your development might require others to change their working practices).

Requirements and assessment

Each student must submit a project proposal, countersigned by the proposed supervisor, by the end of the Spring semester. This will be reviewed by the Course Director. The work undertaken must be a *practical, problem solving project,* involve a *substantial computing element* **in a Big Data application area**.

At the conclusion of the project the student must submit:

- A **written dissertation** giving an account of the project. The dissertation is assessed independently by the project's supervisor and a second marker, and is reviewed by the External Examiner.
- A **project workbook**. The workbook is reviewed by project's supervisor and a second marker.

In addition, the student is **required:**

- To **present a project poster and give an "elevator pitch"** during a presentation day in August.
- To **demonstrate** their project to their supervisor and second marker at the completion of the project.

The workbook, poster and demonstration will be *taken into consideration* during the overall project assessment, but are *not formally assessed*.

The quality of the following aspects of your project and dissertation will be taken into account in the assessment:

Formulation:

Statement of the purpose and objectives of the project.

Background and discussion:

Explanation of the state-of-the-art as found in the literature and other related work, and your assessment of this. Analysis and specification of the problem being tackled.

Design approach and solution achieved:

Description and justification of your approach to the problem. Discussion of any significant choices that had to made, in particular where there were trade-offs or compromises to be resolved. Description of your solution, including an appropriate level of implementation detail. Description of testing and evaluation of your solution. Explanation of what you actually did if you were unable to completely follow your planned approach.

Conclusions/assessment:

Summary of achievements. Reflection on strengths and weaknesses of the solution. Recommendations for further work.

Difficulty:

The level of difficulty of the project (in the dissertation you should draw attention to any problems or difficulties which you could not reasonably have overcome, and to any technologies that you needed to research and learn in order to carry out the work).

Achievement:

The level of achievement in the project.

Presentation:

Try to give a good presentation of your work. Make effective use of a word processor to give a neat layout of the dissertation. Use spelling checkers, grammar style analysers, etc. wherever possible. Give your supervisor good time to read your drafts.

Plagiarism

The University expects that projects submitted are a student's own work. Plagiarism means presenting the work of others as though it were your own. The University takes a very serious view of plagiarism, and the penalties can be severe (ranging from a reduced grade in the assessment, through a fail grade for the module, to expulsion from the University for more serious, or repeated, offences). See the University policy details at `http://www.stir.ac.uk/academicpolicy/handbook/assessment/#q-8`

Online Material: `http://www.cs.stir.ac.uk/courses/msc/projects/`

The Web page contains more specific guidance and other useful information, including a Microsoft Word dissertation template and tutorials. Check the Web page periodically for updated information.

Textbooks

No particular textbooks are prescribed, but the following general books on communication skills may be of help.

- R. Barass. *Scientists must write* . Chapman and Hall, 1978, ISBN 0-412-15430-7
- G. V. Carey. *Mind the Stop*. Pelican, 1971, ISBN 0-140-51072-9

- H. W. Fowler and R. W. Burchfield. *New Fowler's Modern English Usage*. Oxford University Press, 1996 (third edition), ISBN 0-198-69126-2
- Sir E. Gowers. *The Complete Plain Words*. Penguin, 1987, ISBN 0-140-51199-7
- J. A. Sharp and K. Howard. *The Management of a Student Research Project*. Gower, 1996 (second edition)
- W. Strunk, Jr. *The Elements of Style*. Allyn and Bacon, 1995 (third edition), ISBN 0-205-19158-4