1 Case for Support

As part of the university wide, cross-college distance learning initiative in Data Science, we propose the Applied Research Project (ARP) in Data Science course. The ARP can be taken once students have completed the Introductory course and at least one further 10 credit specialisation module. It allows students to apply the skills they have acquired during their coursework to investigating a small, well-defined problem in Data Science.

Like other distance education courses, the Data Science course will be split into terms, with Term 1 coinciding with Semester 1, Term 2 with Semester 2, and Term 3 with the post-Easter exam period.

The ARP will be worth 20 credits and taught at SCQF Level 11. It is an optional course that counts towards the credit requirements for a Postgraduate Certificate, Diploma, or Masters in Data Science. The ARP is smaller in scope than a Masters thesis and is thus ideal for students who are not looking to complete a full Masters Course, but would like to augment their coursework with an in-depth practical project. Students can also use the ARP to produce pilot work for their Masters project.

The project should

- focus on a clearly defined aspect of Data Science, including but not limited to data analytics, data architecture, interfaces to data, or data protection. In-depth analyses of large data sets need to have a strong methodological component.
- be supervised by an academic member of staff of the University of Edinburgh
- be new work undertaken specifically for the course; repurposing existing work is not permitted
- go beyond merely applying techniques and methods learned during coursework; this can be shown by thorough evaluation, critical reflection, or in-depth comparison
- build on and incorporate prior knowledge
• completable in approximately 175 hours of study (including write up), with 25 hours set aside for discussion with fellow students and supervision time.

While Data Science and Informatics staff will be encouraged to submit project proposals, students will be strongly encouraged to work on a real world problem from their own practice.

1.1 Overall Contribution to Teaching Portfolio

It is hoped that the outline for this course (with different entry requirements) can be reused within the portfolio of online Masters programmes being developed at Informatics.

1.2 Target Audience and Expected Demand

The course will be delivered entirely online. The target audience consists of people who have received at least 30 credits from courses from the University of Edinburgh Online Data Science curriculum. Typically, this will be a combination of a twenty-credit introductory course and an advanced course. The average intake will depend on the success of the Data Science programme, but within the next five years, we expect that around 20 students will be taking the course per year.

1.3 Relation to Existing Curriculum

The course will build on the existing experience with Masters and Honours thesis supervision as well as the Undergraduate Research Project (URP).

1.4 Resources

The course will be delivered using the University’s Moodle installation. No additional web pages or web mark infrastructure will be required. The Course Organiser (from Informatics) will be responsible for managing the course and moderating marks. The Course Organiser will be paid for their work through the start up funding for the Informatics MSc programmes, therefore, the course is initially cost neutral for Informatics and will eventually finance itself.

2 Course Management

2.1 Course information and publicity

Course information will be disseminated through the online Data Science curriculum.
2.2 Assessment

The assessment will be made based on class participation (10%), the initial project schedule (20%) and the final report (70%).

Class participation consists of two constructive feedback posts about fellow students’ work, which will be marked by the course organiser. Constructive feedback shows that the student has identified strengths and weaknesses in the other person’s work, and has made a useful suggestion for either boosting one of the strengths or addressing one of the weaknesses. Students nominate the posts that they want to be graded on.

The initial project schedule has a guideline length of about 6 pages (A4, 12pt, single-spaced) excluding appendices and references. This consists of aims and objectives, a statement of relevance to the Data Science course, an outline of the proposed methods, a timeline, and an annotated bibliography of key references. The schedule will be marked by the supervisor.

The main part of the report has a guideline length of about 20 pages (A4, 12pt, single-spaced) excluding appendices and references. The report can draw upon supplementary work possibly undertaken in collaboration (for example artefacts, research poster, preliminary work by others), but the report itself must be the students individual work. The main report will be marked by the supervisor and a second marker.

The marking form for the course will be modified from the Masters Project Report with appropriate changes that reflect the shorter duration of the project and implemented in the Moodle platform.

Marks will be moderated by the course organiser based on the report and the marking form taking into account any mitigating circumstances. The course organiser has the final decision about the mark.

2.3 Management of teaching delivery

Term/Semester before Delivery: The course organiser asks staff and tutors on the Data Science courses to propose fall-back projects for the ARP. Interested members of Informatics staff can also propose projects. The course organiser will also prepare a list of relevant staff members who are happy to supervise self-proposed ARP projects within their area of expertise, and will help match students with potential supervisors.

All projects must be approved by the course organiser.

Before registering for the course, students must

- indicate whether they plan to work on an existing project or a self-proposed project
- have the approval of their intended supervisor and the course organiser

Delivery terms The course is delivered over two terms, in keeping with the part-time nature of the programme. It can start either in Term 1 or Term 2 of the programme.
End of Week 6, Term 1: Student submits a six-page project schedule. This is marked by the supervisor and the course organiser and counts for 15% of the final mark.

End of Week 11, Term 1: Student submits a slide deck with a progress report and an updated schedule.

Week 12, Term 1: All students must provide constructive feedback on the slide decks of at least two other students in the Discussion Forum.

End of Week 5, Term 2: Student submits a second slide deck with a progress report and an updated schedule.

Week 6, Term 2: All students must provide constructive feedback on the slide decks of at least two other students in the Discussion Forum.

Week 12, Term 2: Final project reports due. Students nominate two of their constructive feedback posts for marking.

Project schedules are marked by the supervisor within one week, and approved by the course organiser within two further weeks. Final project reports are marked by the supervisor and a second marker within two weeks, followed by one week for reconciling marks. The final mark will be approved, and if necessary moderated, by the course organiser within three further weeks. Constructive feedback posts are marked by the course organiser within two weeks.
A Course Descriptor

Course Outline

Context: Edinburgh Data Science Online
School: School of Informatics
College: College of Science and Engineering
Availability: Available to all Data Science Online students
Credit level: 11
Credit points: 20
Acronym: TBD

Course description: In this project, students will identify and address a problem related to Data Science. Typical areas of activity will include planning and organising a study; conducting a study; reporting a study; working in a team. Studies can involve the construction of an artefact, experimentation, evaluation, requirements engineering, or an investigation of structures and processes. Artefacts can include software, hardware, a robotic device, some other artefact incorporating computation, or some combination of these. The main topic of the study must be related to one of the courses in the Data Science curriculum and have a clear link with Data Science.

The project is conducted by the student under the supervision of a member of teaching staff and possibly in collaboration with a research group. While the project specification can be provided by a member of staff, students are encouraged to specify their own project. All project specifications must be approved by the Course Organiser.

Entry Requirements

This course is open to all Data Science Online students who have successfully completed at least 30 credits worth of courses. Admission to the course is strictly by permission of the Course Organiser. Admission requires availability of both project and supervision, and support from the project supervisor.

Course Delivery Information

Course Start Date: First week of Term 1 (Distance Learning Schedule)
Breakdown of Learning and Teaching activities:
Total hours: 200
Interacting with other students online: 20
Supervision hours: 20
Practical: 100
Demonstration in virtual classroom: 20
Preparing reports: 40
Breakdown of Assessment Methods: Written Exam 0 %, Coursework 100%
Summary of Intended Learning Outcomes:
1. Structure and summarise a body of knowledge relating to addressing a research problem in Data Science

2. Actively conduct a programme of work in further investigation of issues related to the problem

3. Solve conceptual problems which arise during the investigation

4. Critically evaluate the outcome of the investigation.

5. Present work in an online forum, with video or audio demonstration of working artefacts where appropriate.

**Assessment Information**

The project is assessed on the basis of

- two discussion posts on the forum that comment on another student’s presentations (10%)
- a project schedule (20%)
- a written report (70%)

The discussion posts should address the strengths and weaknesses of the project as described in the presentation and offer constructive suggestions to address a weakness or boost a strength.

The project schedule of about 6 pages (A4, single spaced, 12pt) should typically contain:

- aims and objectives
- a statement of relevance to the Data Science course
- an outline of the proposed methods
- a project plan with time line
- a brief annotated bibliography of key references.

The written report of about 20 pages (A4, single spaced, 12pt) should typically contain:

- Title page with abstract (a one or two paragraph summary of the contents).
- Introduction and synopsis, in which the project topic is described and the main results of the project are briefly summarised.
- Discussion of the work in the project, in which the various sub-problems, solutions and difficulties are examined.
• Conclusion, in which the main achievements are reviewed, and unsolved problems and directions for further work are presented.

• Bibliography

Special Arrangements: None

Additional Information

Syllabus: Project dependent
Relevant QAA Computing Curriculum Sections: All
Reading list: Project dependent