



Course Proposal Form

Please see Page 2 for instructions on which parts of this form to complete, whom to consult with to avoid unnecessary effort, and where to send the completed form.

Proposer(s): Mary Cryan

Date: 11th February 2020

Cover page: Basic permanent course information

Unless otherwise noted, items in this section are entered into EUCLID and **cannot** be changed without creating an entirely new course.

Course Name	Honours Project (Data Science Graduate Apprenticeship)
Course Acronym <i>(used by the School only, e.g., for the Sortable Course List)</i>	PROJ-GA
Course Level If the course is only available to MSc students, then it must be classed as Postgraduate. All other courses, regardless of level, are Undergraduate.	Undergraduate
Normal Year Taken	UG4
Also available in years <i>[This can be changed later if need be.]</i>	
SCQF Credit Level Level 8 should normally be used for pre-honours courses. Level 10 should normally be used for optional UG3 courses (so UG4 students may also take them) and for courses aimed mainly at UG4 students. Level 11 should be used for courses aimed mainly at MSc students, whether or not UG4 students can also take them.	10
SCQF Credit Points	40
Delivery Location	Campus (and Industrial Placement)
Course Type	Dissertation
Marking Scheme By default, courses use a numerical marking scheme. If you wish to use a grade-only marking scheme, your course proposal below should justify this.	Standard (numerical)

Guidance for remaining sections:

For an initial course proposal, please complete the **cover page and Section 1 (Case for Support)**, which asks you to describe the need for this course and to provide an overview of the course design, including the learning outcomes. **Please discuss your plans as early as possible with the head of Curriculum Review to avoid unnecessary effort.**

Send the form with these sections completed to the BoS Academic Secretary and head of Curriculum Review (listed on the BoS page) to obtain their comments before filling out the remainder of the form.

If a full proposal is invited, please complete the remaining sections and send to iss-bos@inf.ed.ac.uk.

2. Student-facing course description and additional feedback and assessment information.

This section provides most of the information students see in the DRPS entry for this course, as well as related details for BoS consideration.

3. Further information for BoS consideration: sample materials.

4. Additional Course Details required for DRPS. *[Administrative information such as delivery timing and prerequisites.]*

5. Placement in degree programme tables. *[Required for all level 9-11 courses; used to determine where the course will be added to existing degree programme tables.]*

6. Comments from colleagues. *[All course proposal should be sent to relevant colleagues in the area as well as to the appropriate year organizer and BoS Academic Secretary for comment in good time before the BoS meeting. Use this section to indicate what feedback has been solicited and received.]*

Colour coding and item-by-item guidance:

Guidance is provided in italics for each item. Please also refer to the guidance for new course proposals at <http://www.inf.ed.ac.uk/student-services/committees/board-of-studies/course-proposal-guidelines>. Examples of previous course proposal submissions are available on the past meetings page <http://web.inf.ed.ac.uk/infweb/admin/committees/bos/meetings-directory> but note that the proposal form was updated in Jan 2019.

Sections in gold are for student view and are required before a course can be entered into DRPS. You must complete these sections even if your course has already been approved based on other documentation.

Sections in orange are for School use but are still required for all courses (even those that have already been approved based on other documentation).

Section in gray are for consideration by the Board of Studies. They are normally required for all new course proposals but may be omitted in some circumstances (e.g., for invited course proposals) if you obtain permission in advance.

1. Case for support

This section is for consideration by the Board of Studies. The final two boxes (Learning Outcomes, Graduate Attributes) will also go into the student-facing course description.

Overall contribution to teaching portfolio and relation to existing curriculum

Please explain (a) what motivates the course proposal (e.g. a previous course having become outdated/inappropriate, an emergent or maturing research area or new research activity in the School, offerings of our competitors) and (b) how it relates to existing courses and degree programmes (including any prerequisite courses). Every new course should make an important contribution to the delivery of our [Degree Programmes](#).

We have a new BSc in Data Science running in “Graduate Apprenticeship” format. The students on this course will do a project in 4th year (and write a dissertation), but we want to make explicit the requirement that the project should involve/relate-to the work the student does during their 4th year placement. Hence we are creating a new Course where this requirement is made explicit.

Target audience and expected demand

Describe the type of student the course would appeal to in terms of background, level of ability, and interests, and the expected class size for the course based on anticipated demand. A good justification would include some evidence, e.g. by referring to projects in an area, class sizes in similar courses, employer demand for the skills taught in the course, etc

We have roughly 11 (undergraduate) Graduate Apprentices in their 2nd year, and 5 in their 1st year. We expect an increase in entrants in 2020/21 to approximately 15-20.

Anticipated Resource Requirements

Estimate how much lecturing, tutoring, exam preparation and marking effort will be needed in steady state, and any additional resources needed to set the course up initially. Provide estimates relative to class size where applicable and discuss how support staff will be recruited and supervised, if the class is likely to be very large. Please mention any scaling limits due to equipment or space. If equipment is required, say how it will be procured and maintained.]

There are few additional resource requirements over the standard 4th year project most undergraduates take (INFR10044). The apprentices will have a supervisor within the School (which is standard), plus a mentor at their Industrial placement.

Quotas, special arrangements or unusual characteristics

Please specify if this course requires any special arrangements such as quotas or other registration arrangements; is a collaboration with another school or institution, or has other atypical characteristics that may affect finances or student registration. Further justification/information may be requested for such courses.

This course should only be available to students who are registered on 4th year of the Data Science Graduate Apprenticeship (UTBSCDATSC1F). We would ask 3rd year apprentices to discuss and plan a likely theme for their project during the early months of their 3rd year Placement (at their Industrial host) and then “Self-Propose” their individual project. The work will be carried out with some involvement of their Industrial host – we would expect the student to do some of the work while at University during semester 1 of 4th year, but also spend some of semester 2 (while on placement with the Industrial host) working on the project. Discussions with the partners have resulted in an arrangement where 7weeks of the 4th year semester 2 placement should be available for project work (and writing-up).

Narrative description of the course aims and structure

Please describe the main goals of the course and how the course design will allow students to achieve those goals. This section should be consistent with the student-facing information provided below, but should provide additional information to help colleagues at BoS understand the vision and structure of the course. This description may refer to the learning outcomes and graduate attributes (next two boxes) and should explain how activities such as tutorials, labs, or in-lecture activities will support them, and how the proposed assessments will assess them.

For courses that are important pre-requisites for other courses, this section may also provide content/syllabus information which is too detailed for the student-facing description, such as a lecture-by-lecture syllabus.

This is a major project and is intended to allow students to demonstrate their ability to organise and carry out a substantial piece of work. The project involves both the application of skills learnt in the past and the acquisition of new skills. Typical areas of activity will be: gathering and understanding background information; solving conceptual problems; design; implementation; experimentation and evaluation; writing up.

This course is designed for students on the Data Science Apprenticeship, and therefore the project should focus on some aspect of Data Science such as Data Analytics, Machine Learning, Security and Privacy, Human Factors, Software, Algorithms, Data Visualisation, or another theme in Data Science.

The project will be conducted individually by the student under the joint supervision of a member of teaching staff at the University, and a Mentor at the Industrial Partner which hosts this Graduate Apprentice. We expect the project specification to be designed by the student (as a self-proposed project) with input from the Mentor and proposed supervisor. All project specifications must be approved by the Project Coordinator, and any IP or Ethics concerns must be formally addressed before work on the project begins.

(Note for this Proposal, I have chosen to use the same text as for the "Student facing" description)

Summary of Intended Learning Outcomes (MAXIMUM OF 5)

List the learning outcomes of the course. These must be assessable (i.e., observable), so must specify what the student should be able to do concretely, not simply what they should "understand". Use concrete verbs that indicate (a) what type of assessment would be appropriate, and (b) what level of knowledge/thinking is expected (from recall to analysis to novel creation). **Example verbs:** define, explain, implement, compare, justify. Assessments (described later) should be tied to the learning outcomes.

Outcomes should typically focus more on the types of thinking/skills developed than on the detailed course content, and the level of thinking should be appropriate to the level of the course: outcomes for a Level 11 course should include more higher-level thinking skills than for a Level 8 course. Further guidance on writing learning outcomes can be found at <https://www.ncl.ac.uk/ltts/assets/documents/res-writinglearningoutcomes.pdf>

On completion of this course, the student will be able to

- 1) Structure, summarize and critically evaluate a body of knowledge relating to a substantial project topic in Data Science
- 2) Conduct a programme of work in further investigation of issues related to this topic
- 3) Discuss and solve conceptual and/or pragmatic problems which arise during the investigation, and critically evaluate the investigation, with reference to design decisions made.
- 4) Discuss and evaluate considerations that arise from carrying out a project in collaboration with industry, and evaluate how such an experience can influence development as a Data Scientist.
- 5) Present the work orally and visually, with demonstration of working artefacts when appropriate

Graduate Attributes, Personal & Professional Skills

List the personal attributes and generic transferrable skills this course will help develop. Examples include

- **Cognitive skills:** *problem-solving, critical/analytical thinking, handling ambiguity*
- **Responsibility, autonomy, effectiveness:** *independent learning, self-awareness and reflection, creativity, decision-making, leadership, organization and time management, flexibility and change management, ethical/social/professional awareness and responsibility, entrepreneurship*
- **Communication:** *interpersonal/teamwork skills, verbal and/or written communication, cross-cultural or cross-disciplinary communication*

This course requires technical ability, independent learning, evaluation and reflection, development of writing and other communication skills, time management, professional awareness. It develops almost all of the Personal and Professional sub-categories mentioned above.

1. Student-facing course description and additional feedback and assessment information

Except where noted, all fields are required and will go into the DRPS entry for the course (for use by students). **Important:** any text in DRPS is effectively a contract with students, so should not include details that are likely to change from year to year.

<p>Summary Description <i>Provide a brief official description of the course, around 100 words. This should be worded in a student-friendly way, it is the part of the descriptor a student is most likely to read. If this course replaces another course, please say so in this summary.</i></p>	<p>This is a major project and is intended to allow students to demonstrate their ability to organise and carry out a substantial piece of work. The project involves both the application of skills learnt in the past and the acquisition of new skills. Typical areas of activity will be: gathering and understanding background information; solving conceptual problems; design; implementation; experimentation and evaluation; writing up.</p> <p>This course is designed for students on the Data Science Apprenticeship, and therefore the project should focus on some aspect of Data Science, whether this may be Data Analytics, Machine Learning, Security and Privacy, Human Factors, Software, Algorithms, Data Visualisation, or another theme of the field of Data Science.</p> <p>The project will be conducted individually by the student under the joint supervision of a member of teaching staff at the University, and a Mentor at the Industrial Partner which hosts this Graduate Apprentice. We expect the project specification to be designed by the student (as a self-proposed project) with input from the Mentor and proposed supervisor. All project specifications must be approved by the Project Coordinator, and any IP or Ethics concerns must be formally addressed before work on the project begins.</p>
<p>Keywords <i>Give a list of searchable keywords.</i></p>	<p>Project, Data Science, Graduate Apprenticeship, Dissertation, Independent project</p>
<p>Course Description <i>A more detailed student-facing description of the course, which should normally include (a) a more in-depth academic description of the learning aims, nature and context of the course, (b) a rough outline of the content or syllabus, often as bullet points, and (c) a description of how the course will be taught, how students are expected to engage with their learning and how they will be expected to evidence and demonstrate their achievement of the intended learning outcomes.]</i></p>	<p>We expect that the student will carry out work on the project during semester 1 of 4th year (while attending University) and complete the work during semester 2 (while on placement with the Industrial host).</p> <p>This details of the course will be “Project dependent”.</p>
<p>Assessment Weightings: <i>These should correspond approximately to the</i></p>	<p>Coursework 100%</p>

<p>proportion of learning outcomes that each component assesses. More than 30% coursework requires specific justification.</p> <p>The expectation for a 10pt course is 20% coursework with the equivalent of one 15-20hr assessed assignment (but possibly split into smaller pieces). See 'components of assessment' below.</p>	
<p>Further Assessment Information</p> <p>Provide any further information that should go on DRPS for students. E.g., if the assessment includes required group work or if students must pass some individual component of assessment as well as the course overall.</p>	<p>The project is assessed on the basis of a written report which should typically contain:</p> <ul style="list-style-type: none"> - Title page with abstract (a one or two paragraph summary of the contents). - Introduction and synopsis, in which the project topic is described and set in the context of published literature, and the main results are briefly summarised. - Discussion of the Industrial collaboration, any extra considerations necessary because of that collaboration, and a discussion of the Data Skills and techniques learned/employed in carrying out the project work. - Discussion of the work undertaken, in which the various sub-problems, solutions and difficulties are examined. - If appropriate, a description of experiments undertaken, a presentation of the data gleaned from them, and an interpretation of that data. - Conclusion, in which the main achievements are reviewed, and unsolved problems and directions for further work are presented. - Bibliography.
<p>Components of assessment and time spent on assignments (for BoS only)</p> <p>If not already included in the course narrative description, please describe the type of assessments (oral presentation, report, programming, etc) and how each component of assessment will assess the intended learning outcomes. Where coursework involves group work, it is important to remember that every student has to be assessed individually for their contribution to any jointly produced piece of work.</p> <p>Also estimate how many hours students will spend on assignments. Please see the School policy on Workload and Assessment, which states that students should not be expected to spend more than 6-7 hrs/wk per 10 credits, including contact hours.</p> <p>Note that it often desirable to include formative assignments which are not formally assessed but submitted for feedback, often in combination with peer assessment.</p>	

<p>Feedback Information Provide a high-level description of how and what type of feedback will be provided to students, for inclusion in DRPS.</p>	<p>There is only one submission for this course (the dissertation). Students will obtain feedback from the two markers after the exam board. Formative feedback will be provided by the supervisor throughout the year, and from the “project group organiser” during semester 1.</p>																				
<p>Additional Feedback Information (for BoS use only) If not already included in the course narrative, provide further details on planned feedback arrangements. This includes how course feedback is solicited from the class and responded to, as well as what feedback students will get (either on work that contributes to their final mark, or not).</p> <p>The University is committed to a baseline of principles regarding feedback that we have to implement at every level, and the School encourages submission of at least one piece of written work for formative feedback.</p> <p>In general, formative feedback:</p> <ul style="list-style-type: none"> • Should say how students can improve. • Need not be on individual work (e.g., consider a lecture or document summarizing common issues.) • Can include oral feedback during labs/tutorials • Can include feedback from peers • Clickers/TopHat/equivalents can provide in-class feedback for both students and lecturer. • Is returned in time for other forms of assessment to which it relates, to allow feedforward. 	<p>The student will obtain formative feedback from the supervisor in individual meetings, to help guide the project, and help the student prepare to write the dissertation. The student will also participate in a “project group meeting(s)” while at University during semester 1, and will be provided with written feedback.</p> <p>There is also the opportunity to obtain written feedback on a short “interim report” submitted early in semester 2.</p>																				
<p>Breakdown of Learning and Teaching Activities State how many hours students spend on each part of the course. The total should be 10 x course credits, but please also see the School policy on Workload and Assessment, which states that students should not be expected to spend more than 6-7 hrs/wk per 10 credits, including contact hours.</p> <p>Assume 10 weeks of lectures slots and 10 weeks of tutorials, but these need not all be used. As a guideline, a 10-pt course typically has 18-20 lecture hours, but should have only around 15 lectures of examinable material; the rest should be used for guest lectures, revision sessions, introductions to assignments, etc.</p>	<p>Contact hours</p> <table border="1" data-bbox="699 1296 1471 1621"> <thead> <tr> <th>Hours</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Lecture Hours</td> </tr> <tr> <td>4</td> <td>Seminar/Tutorial Hours</td> </tr> <tr> <td>11</td> <td>Dissertation Project Supervision Hours</td> </tr> <tr> <td>0</td> <td>Supervised practical/Workshop/Studio hours</td> </tr> <tr> <td>1</td> <td>Feedback/Feedforward hours</td> </tr> <tr> <td>1</td> <td>Summative assessment hours</td> </tr> <tr> <td>0</td> <td>Revision Session Hours</td> </tr> </tbody> </table> <p>Non-contact hours</p> <table border="1" data-bbox="699 1722 1471 1845"> <thead> <tr> <th>Hours</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>381</td> <td>Directed Learning & Independent Learning hours</td> </tr> </tbody> </table> <p>Total hours: 400</p>	Hours	Type	2	Lecture Hours	4	Seminar/Tutorial Hours	11	Dissertation Project Supervision Hours	0	Supervised practical/Workshop/Studio hours	1	Feedback/Feedforward hours	1	Summative assessment hours	0	Revision Session Hours	Hours	Type	381	Directed Learning & Independent Learning hours
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Reading List/Learning Resources

You are encouraged to create resource lists using
[LEGANTO](#)

Project dependent

1. Further information for BoS consideration: sample materials

A full proposal for a new course must include examples of exercises and assessment. Please provide these below, along with publicity information if the course is to be advertised outwith the School.

<p>Course information and publicity <i>The course web page (typically the Learn landing page) will be linked from the Sortable Course List, and information such as timetables and assignment deadlines must be made available prior to the start of the academic year. Please specify here if any additional info/publicity is needed for your course: typically only if it is aimed largely at non-Sol students.</i></p>	<p>None</p>
<p>Sample tutorial/lab sheet questions <i>Provide a list of tutorial questions and answers and/or samples of lab sheets. These need not be fully fleshed out but should indicate what sort of exercises will be provided to help students learn the material.</i></p>	<p>Not applicable</p>
<p>Sample assessment materials <i>If the course is primarily assessed by exam, provide a sample exam question with model answers. Any non-standard exam format must be justified. The online list of past exam papers gives an idea of typical and alternative exam formats: http://www.inf.ed.ac.uk/teaching/exam_papers/.</i></p> <p><i>If the course is largely or primarily assessed by coursework, provide a sketch of a possible assignment with an estimate of effort against each sub-task and a description of marking criteria.</i></p>	<p>Not applicable</p>
<p>Any other relevant materials <i>Include anything else that is relevant, possibly in the form of links. If you do not want to specify a set of concrete readings for the official course descriptor, please list examples here.</i></p>	<p>Not applicable</p>

2. Additional Course Details for DRPS

Except where otherwise noted, these fields are required for entry into EUCLID and will be visible to students in the DRPS entry.

Planned Academic Year of Delivery <i>(The first year you anticipate the course running, e.g. AY 2019-20)</i>	2022/23
Course Organiser <i>(By default, the course proposer)</i>	“Projects Organiser”
Intended Delivery Period	Full Year
Timetable considerations/conflicts <i>For School use. Please specify any constraints to be considered (e.g. overlap of popular combinations, other specialism courses, external courses etc). Include whether the semester delivery is constrained or could be flexible.</i>	Not relevant
Is this course available to visiting students?	No If no, please provide a justification here: Only available to student on degree programme (UTBSCDATSC1F)
Required pre-requisite courses <i>Use sparingly: these are enforced in PATH and can only be waived by approval from the School's Curriculum Approval Officer. Note that cross-year required pre-requisites may prevent MSc students from registering; consider using recommended pre-requisites or “other requirements” instead.</i>	No
Recommended pre-requisite courses	No
Required co-requisite courses <i>Specify any courses that must be taken in parallel with the existing course. Note that this leads to a timetabling constraint that should be mentioned elsewhere in the proposal.</i>	No

<p>Prohibited Combinations Specify any courses that may not be taken in combination with the proposed course].</p>	<p>No</p>
<p>Other Requirements/Additional Information This information is often used by MSc students and students from other Schools to see if they have appropriate background without having done our School's courses. So please avoid course titles, instead list specific knowledge and skills (such as mathematical concepts, programming ability or specific languages, etc).</p> <p>Also list any other constraints on registration, for example: "Only available to 4th Year Informatics students including those on joint degrees." or "This course is open to all Informatics students including those on joint degrees, and to students in the School of Mathematics. Other external students whose DPT does not list this course should seek permission from the course organiser."</p>	<p>Yes: Only available to students on degree programme (UTBSCDATSC1F)</p>
<p>Visiting Student Pre-requisites</p>	<p>Same as "other requirements"</p>

3. Placement in degree programme tables: for level 9-11 courses only

This section is for consideration by the Board of Studies and will be used later by ITO to determine where the course will be added to existing degree programme tables.

<p>Is this course restricted to students on a specific degree? <i>E.g., some courses are only available to students on a specific CDT or MSc.</i></p>	<p>Yes: Only available to students on the BSc in Data Science (Graduate Apprenticeship) (UTBSCDATSC1F)</p>
<p>Is this course compulsory for students on any degree(s)?</p>	<p>Yes: Compulsory for students on the BSc in Data Science (Graduate Apprenticeship) (UTBSCDATSC1F)</p>
<p>Any issues for part-time students? <i>Normally, part-time students have access to the same courses as full-time students on the equivalent degree. If you anticipate any problems with this, please specify here.</i></p>	

For optional courses:

If this course is available but non-compulsory for students on various degrees (most courses), please fill in this section. The choices here determine where the course appears in degree programme tables (DPTs) and the 2-3 character tags are displayed in the Informatics sortable course list.

<p>Should this course be tagged as 'ML' (machine learning foundations and methods)? <i>Courses with the ML tag are typically very high-demand and most degrees limit the number of ML credits. If your course might appeal to a similar audience but draw off students from these large courses, please select 'no' and choose one of the tags below.</i></p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes</p>
<p>If you chose 'no', please choose at least one of the following tags... <i>Ideally, select exactly one, unless there is a good argument for more than one. These three are used in various combinations for many of our degrees.</i></p>	<p><input type="checkbox"/> FSS (CS foundations, systems, and software) <input type="checkbox"/> AIA (artificial intelligence applications and paradigms) <input type="checkbox"/> COG (cognitive science: including HCI and NLP courses, but not most other AI courses. Please restrict to courses most relevant to natural cognition.)</p>
<p>...and also tick if any of the following tags or categories apply. <i>Do not tick any of these if you selected 'ML' already.</i></p>	<p><input type="checkbox"/> NS (natural systems: e.g., computation by or about biological or social systems. Many COG courses are also NS. This tag is mainly relevant for MSc in Informatics.) <input type="checkbox"/> SE (software engineering: including courses that are highly relevant to SE degrees. All SE courses should also be FSS. This tag is mainly relevant for UG SE degrees.) <input type="checkbox"/> Databases and data management systems (used for Data Science MSc and MSc(R))</p>

	<p>___ Unstructured data and applications (used for Data Science MSc and MSc(R))</p> <p>___ Level 11 Security courses (used for Security MSc)</p>
<p>If you are not sure which tags are most appropriate or have other questions about this section, please note any comments/issues here.</p>	

4. Comments from colleagues

All course proposal should be sent to relevant colleagues in the area as well as to the appropriate year organizer and BoS Academic Secretary for comment in good time before the BoS meeting. Please indicate here what feedback has been solicited and received.

<p>Additional Comments <i>Summarise any comments received from relevant individuals prior to proposing the course. If you have not discussed this proposal with others please note this.</i></p>	
<p>Year Organiser Comments <i>Year Organisers are responsible for maintaining the official Year Guides for every year of study, which, among other things, provide guidance on available course choices and specialist areas. The Year Organisers of all years for which the course will be offered should be consulted on the appropriateness and relevance on the course. Issues to consider here include balance of course offerings across semesters, subject areas, and credit levels, timetabling implications, fit into the administrative structures used in delivering that year.]</i></p>	
<p>BoS Academic Secretary Comments <i>Proposals must be checked by the Secretary of the Board of Studies prior to discussion at the actual Board meeting. This is a placeholder for their comments, mainly on the formal quality of the content provided above.</i></p>	