Informatics Board of Studies – Course Proposal
Proposed course title: Performance Modelling
(distance version of INFR11082)

Proposer(s): Jane Hillston and Bob Fisher
Date: 11/9/2017

This template contains the following sections, which should be prepared roughly in the order in which they appear (to avoid spending too much time on preparation of proposals that are unlikely to be approved):
1. Case for Support
– to be supplied by the proposer and shown to the BoS Academic Secretary prior to preparation of an in-depth course description
1a. Overall contribution to teaching portfolio
1b. Target audience and expected demand
1c. Relation to existing curriculum
1d. Resources
2. Course descriptor
- this is the official course documentation that will be published if the course is approved, ITO and the BoS Academic Secretary can assist in its preparation
3. Course materials
- these should be prepared once the Board meeting at which the proposal will be discussed has been specified
3a. Sample exam question
3b. Sample coursework specification
3c. Sample tutorial/lab sheet question
3d. Any other relevant materials
4. Course management
- this information can be compiled in parallel to the elicitation of comments for section 5.
4a. Course information and publicity
4b. Feedback
4c. Management of teaching delivery
5. Comments
- to be collected by the proposer in good time before the actual BoS meeting and included as received
5a. Year Organiser Comments
5b. Degree Programme Co-Ordinators
5c. BoS Academic Secretary

[Guidance in square brackets below 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://www.inf.ed.ac.uk/admin/committees/bos/meetings/.]

1. Case for Support
[This section should summarise why the new course is needed, how it fits with the existing course portfolio, the curricula of our Degree Programmes, and delivery of teaching for the different years it would affect.]

This proposal is to create a Performance Modelling (hereafter PM) course to be offered as an online distance learning course synchronously and nearly identical to the residential PM course, in order to take

advantage of interest in distance education in Informatics. The general expectation is that distant students will be able to acquire an almost identical experience to local students.

The distance learning offering will allow interested students to study in demand topics without the constraints of campus attendance, and School staff to develop skills and experience in the development and delivery of innovative distance education programmes, and in the support of distance education students. PM is expected to become one of the courses of an eventual distance-based PgCert in Informatics by Distance Learning degree. However, we propose to deliver PM in this form first in 2018/19 as part of the MSc in Data Science, Technology and Innovation (distance learning programme).

1a. Overall contribution to teaching portfolio
[Explain what motivates the course proposal, e.g. an emergent or maturing research area, a previous course having become outdated or inappropriate in other ways, novel research activity or newly acquired expertise in the School, offerings of our competitors.]

The proposed course will be based on a "flipped"/inverted classroom format which has been developed for the on-campus course and will be delivered in this format for the first time in 2017/18. The plan is to adapt PM slightly so that it is suitable for both on-campus and distance students.

The inverted classroom version of the on-campus PM course will be delivered in the following way:
1) Content previously delivered through lectures will be delivered through pre-recorded videos online using the University's Learn Virtual Learning Environment (VLE).
2) These recordings have already been produced in the form of c.60 segments covering 19 topics, with one (typically 10-20 minute long) video with the lecturer speaking in front of a large screen TV and will be provided on the VLE with associated PDF slide sets.
3) Lecture slots will be used to discuss the material covered in videos, answer student questions, and small-group work on tutorial-style problems and exercises posed by the lecturer. Problem sets used during these sessions will be distributed before each session and published together with solutions at the end of the course. Distance learning students will be enabled to participate in these sessions through a live chat, and encouraged to form groups to work together using online means during the sessions.
4) The coursework consists of two exercises worth a total of 25.
5) There is a written exam worth 75% that follows a standard rubric for Honours courses ("any two of three").

The two aspects that need to be adapted slightly in the distance learning form of the course are: 1) examination procedures (although the exam content will be identical. See section 1d), and 2) cohort interaction (See section 1d).

This creation of this distance education version of the PM course will: a) increase the course cohort size (around 25 in previous years), b) prepare the course for delivery as part of the online PgCert in Informatics, and c) extend the use of innovative methods in our current teaching.

1b. 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.]

Students who are likely to take PM are expected to be 1) IT professionals looking to extend their expertise (90%) and 2) students looking for an advanced degree (10%).

A recent market survey by Ninette Premdas (Communications and Marketing) showed about 55%, 40%, 40%, and 55% of 966 respondents interested in a full MSc, a Diploma, a Certificate or selected modules in Informatics, respectively. When asked about individual modules, PM was not mentioned, but on average about 37% of 1012 respondents said that they would be interested in any particular course. Performance modelling is a specialist course that is not routinely taught in most postgraduate programmes, so would be an attractive distance course.

More realistically, we expect that there will be an additional 10 online students per year. There is substantial fee income from the online course, currently £725 per student, which would easily cover any incremental costs for the distance delivery. Based on current support and adding a little due to additional online support (e.g. discussion groups, tutoring and exam invigilation costs), we estimate 4 hours of teaching support per additional distance student will be needed.

1c. Relation to existing curriculum
[This section should describe how the proposed course relates to existing courses, programmes, years of study, and specialisms. Every new course should make an important contribution to the delivery of our Degree Programmes, which are described at http://www.drps.ed.ac.uk/12-13/dpt/drps_inf.html. Please name the Programmes the course will contribute to, and justify its contribution in relation to courses already available within those programmes. For courses available to MSc students, describe which specialism(s) the course should be listed under (see http://www.inf.ed.ac.uk/student-services/teaching-organisation/taught-course-information/year-guides/taught-postgraduate-year-guide/degree-requirements/specialist-areas), and what its significance for the specialism would be. Comment on the fit of the proposed course with the structure of academic years for which it should be offered. This is described in the Year Guides linked from http://www.inf.ed.ac.uk/student-services/teaching-organisation/taught-course-information/year-guides.]

PM is taken mostly by MSc students, but also some undergraduate students. It is one of the options recommended for the Bioinformatics, Computer systems, Computer Security, Theoretical Computer Science MSc themes. The only new aspect will be the eventual inclusion of PM as a course in the online PgCert in Informatics.

1d. Resources
[While course approvals do not anticipate the School's decision that a course will actually be taught in any given year, it is important to describe what resources would be required if it were run. Please describe how much lecturing, tutoring, exam preparation and marking effort will be required in steady state, and any additional resources that will be required to set the course up for the first time. Please make sure that you provide estimates relative to class size if there are natural limits to its scalability (e.g. due to equipment or space requirements). Describe the profile of the course team, including lecturer, tutors, markers, and their required background. Where possible, identify a set of specific lecturers who have confirmed that they would either like to teach this course apart from the proposer, or who could teach the course in principle. It is useful to include ideas and suggestions for potential teaching duty re-allocation (e.g. through course sharing, discontinuation of an existing course, voluntary teaching over and above normal teaching duties) to be taken into account when resourcing decisions are made.]

Course lectures: Slides and videos for lectures of the existing PM course, which is already in inverted form, will be used. The resources are available from the Learn VLE. No additional content will be needed for the benefit of the distance students, but we may need some additional effort to audio/video record/stream lecture hall activities for the benefit of remote students. Lecture recording may be able to use the new Media Hopper Replay service, or the

Collaborate Ultra software. This will enable distance learning students to access (and participate in) discussions of student questions and class based small group discussions. The Collaborate Ultra platform has been used by the IVR and AV courses for distance students.

Online discussions: We expect these will involve the course TA and will occur through the VLE.
Coursework marking: Assignments will be marked in the same manner as at present..
Student interaction: It is important that distance learning students feel a part of both the School and University. Resources are therefore required to engage with and encourage them to work with each other on the coursework, and engage with the rest of the cohort using the VLE social platforms.
Coursework resources: Distance students will do the same assignments as local students, synchronously.
Exam preparation, delivery and marking: The same exam will be taken approximately synchronously by all students, local and distant. The exams will be created and vetted internally and externally in the normal manner, however they will be delivered to distance students by using the QuestionMark software, a web-based platform used last year for the IVR and AV distance student exams. Remote invigilation will be provided by ProctorU, who provide a secure world-wide delivery and invigilation service. Up to 3 versions of the exams may need to be written for 3 different time zone blocks to prevent communication of exam details. All students in the same time zone block will sit the same exam approximately simultaneously. That has been the case so far.
The exams will be marked by local staff in the normal manner. This approach to distance exams has been approved by Student Administration.
Course team: As part of the wider online DSTI effort, a core team will exist to support various aspects related to all distance education courses, e.g. manage underlying distance education platforms, provide administration, etc. J. Hillston will be responsible for the delivery of the distance-based PM course itself.

2. Course descriptor
[This is the official course descriptor that will be published by the University and serves as the authoritative source of information about the course for students. Current course descriptions in the EUCLID Course Catalogue are available from http://www.star.euclid.ed.ac.uk/ipp/cx_sb_infr.htm.]

This section omitted because the course is identical to the existing Performance Modelling course as per the current course descriptor, except extended with additional delivery mechanisms for the distance students.

3. Course materials
3a. Sample exam question(s)
[Sample exam questions with model answers to the individual questions should be provided. A justification of the exam format should be provided where the suggested format non-standard. The online list of past exam papers gives an idea of what exam formats are most commonly used and which alternative formats have been http://www.inf.ed.ac.uk/teaching/exam_papers/.]

These will be similar in format to previous years, and will be identical to those seen by the local students.

3b. Sample coursework specification
[Provide a description of a possible assignment with an estimate of effort against each sub-task and a description of marking criteria.]

This will be identical to the coursework completed by local students.

3c. Sample tutorial/lab sheet questions
[Provide a list of tutorial questions and answers and/or samples of lab sheets.]

Again, tutorial sheets will be identical to those used in residential tutorials.

3d. Any other relevant materials
[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.]

All resources listed on the course web page and on Learn will be accessible to distance learning students.

4. Course management
4a. Course information and publicity
[Describe what information will be provided at the start of the academic year in which format, how and where the course will be advertised, what materials will be made available online and when they will be finalised. Please note that University and School policies require that all course information is available at the start of the academic year including all teaching materials and lecture slides.]

Most course content will be served from the Learn VLE hosted by the University, pointing to the inverted lecture set, reading list, assignments and other relevant materials which are hosted in Learn or MediaHopper (the University's new media server). This course will be advertised alongside the marketing of the PG Certificate/Diploma/MSc in Data Science programme.

4b. Feedback
[Provide details on feedback arrangements for the course. This includes when and how course feedback is solicited from the class and responded to, what feedback will be provided on assessment (coursework and exams) within what timeframe, and what opportunities students will be given to respond to feedback. The University is committed to a baseline of principles regarding feedback that we have to implement at every level, these are described at [http://www.docs.sasg.ed.ac.uk/AcademicServices/Policies/ Feedback_Standards_Guiding_Principles.pdf](http://www.docs.sasg.ed.ac.uk/AcademicServices/Policies/Feedback_Standards_Guiding_Principles.pdf)*. Further guidance is available from* http://www.enhancingfeedback.ed.ac.uk/staff.html*.]*

Students will receive formative feedback through online tutorial participation, eg. via Skype or Collaborate, and Learn's online discussion forum. Each student will also receive formative feedback through intermediate stages of the coursework assignment. Summative feedback will occur through written feedback on their 2 assignments. Additionally, we will monitor class issues through the use of a class student representative, and also occasional SurveyMonkey polls.

4c. Management of teaching delivery
[Provide details on responsibilities of each course staff member, how the lecturer will recruit, train, and supervise other course staff, what forms of communication with the class will be used, how required equipment will be procured and maintained. Include information about what support will be required for this from other parties, e.g. colleagues or the Informatics Teaching Organisation.]

We expect that the course tutor(s) will provide support to course students and flag any issues that arise related to the delivery of the course, as is the case with the normal delivery of local courses. As this course is also part of the Data Science Distance Education effort, the DSTI team or University support teams will handle most issues concerned with remote content delivery, e.g. issues with university-hosted software or VLE. Communication with the distant students will primarily occur via the VLE and a course emailing list. Minimal support is required from the ITO beyond the normal support for any additional student, whether local or distance.

5. Comments

[This section summarises comments received from relevant individuals prior to proposing the course.]

5a. Year Organiser Comments
[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.]

The proposal was reviewed by the Year Organisers and approved at the Informatics Board of Studies. MSc CO: Paul Jackson.

5b. Degree Programme Co-Ordinators
[Degree Programme Co-Ordinators are responsible for maintaining the official Degree Programme Specifications and Degree Programme Table for a given subject area which, among other things, specify the content of courses taken in a Degree Programme. The Degree Programme Co-Ordinators of the relevant subject areas that the course is proposed for should comment on the fit with the current curriculum of the relevant Degree Programmes. Issues to consider here are dependencies arising from pre-, co-requisites, and forbidden combinations, balance of different topics in a Degree Programme, etc.]

The proposal was reviewed by the DPCs and approved at the Informatics Board of Studies. MSc BoE Guido Sanguinetti.

5c. BoS Academic Secretary
[Any proposal has to 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.]

The proposal was reviewed by the Secretary and approved at the Informatics Board of Studies: BoS Alan Smaill.