# 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): Benjamin Bach** **Date: 06/02/2020**

## 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.

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| **Course Name** | Data Visualisation for Professionals |
| **Course Acronym** *(used by the School only, e.g., for the Sortable Course List)* | DataVisPro / DATAVIS-PRO |
| **Course Level**<br>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<br>_X_ Postgraduate<br>(this course is for an external audience, e.g, employees who want to increase their skills. No prior degree is required.) |
| **Normal Year Taken** | __UG1 __UG2 __UG3 __UG4 __UG5 __MSc<br>*(this course is not for students enrolled in a regular programme, it is an online course open to everybody.)* |
| **Also available in years** *[This can be changed later if need be.]* | __UG1 __UG2 __UG3 __UG4 __UG5 __MSc<br>*(same as above)* |
| **SCQF Credit Level**<br>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. | __7 __8 __9 __10 **_X_ 11** |
| **SCQF Credit Points** | **_X_ 10** __20 __40 __60 __80<br>__Other: |
| **Delivery Location** | _Campus **_X_ On-line Distance Learning** |
| **Course Type** | __Standard (default)<br>__Dissertation<br>**_X_ Online Distance Learning**<br>__Other (specify: Placement, Student Led Individually Created Course, Year Abroad) |
| **Marking Scheme**<br>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)<br>**_X_ Letter grade only** |

## 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.*

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| **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.*

This is an online course, meant as upskilling for people outside university, e.g., employees, freelancers or work seeking. Creating, delivering, and maintaining the course is funded by SFC with £80k for 15 months. Theoretically, it can run every semester. This first instance is planned for summer 2020. Funding after July 2020 to continue the course has been requested. It aims to provide participants with a University certificate over 10 credits. The motivation for the course is as follows.

Data visualization is gaining increased interest as a skill, applicable to a wide range of areas and activities: business reports and business analytics, data exploration and data science, data-driven presentations and storytelling, designing infographics, communicating insights, outreach and communication activities, summarizing important facts, monitoring time-critical processes, etc. However, while many tools provide out-of-the box solutions for visualizations (e.g., Tableau and PowerBI), the use of these tools and moreover the creation of bespoke visualizations for specific data, tasks, and audiences remains human labor that requires knowing about human perception, design guidelines, graphic design, data workflows, and presentation.

The course focuses on understanding, applying, and designing interactive visualizations, judging their shortcomings, and creatively think of novel solutions. The course aims to focus on methodological thinking and visualization as a general problem solving. The course is mainly based on an existing course Data Visualisation (Data Visualization, INF11190, https://visualinteractivedata.github.io), organized by the same proposer as this proposal (Benjamin Bach). While INF11190 is targeted toward university students, this new course is an online course targeted towards professionals who are interested in learning about data visualization (see 'Target audience' below). This course is co-proposed, designed, and organized with Gian Marco Campagnolo, from the School of Social and Political Sciences, and who is running an online course "Understanding Visualization".

**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*

The audience of the course includes

- professionals in the area of data analysis and business analytics
- freelancers and (visualization) designers
- journalists
- school teachers
- etc.

No prior knowledge or skills are required to follow the course, and the course contains many relevant real-world examples to link to the different audiences. It is an introductory course which aims to provide the basics of data visualization with respect to data exploration and effective communication.

No programming skills are required for this course. Participants will work on individual visualization projects that include design, reporting, and demonstration and which can be completed with various tools that are taught and mentioned during the course. Ideally participants come with their own data sets and challenges of what they want to work on but example data and problems are provided. These data can be used throughout the course as there are various opportunities to explore, visualize, and otherwise work with the data and related visualizations. Course work is designed to scale to larger numbers of participants (~100 participants). The course offers additional in-situ but non-mandatory tutorials at the University for those students being able to make it to the city. Tutorials will be recorded and we seek ways for live-streaming and remote questioning.

**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.]*

The course will provide online videos for around 2h per week, 1h homework per week, plus three 2h tutorials over the semester to prepare participants for the assignments and learning outcomes. Tutorials might run with a size of 10-20 participants each and a tutor paid by available funding. Participants are expected to bring their own devices. Room booking for in-situ tutorials and provision will be managed by Bayes.

**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.*

The course is run by Informatics and co-organized by Dr. Benjamin Bach (Informatics), Dr. Gian Marco Campagnolo (School of Social and Political Sciences) and supported by Dr. Uta Hinrichs (Univ. of St Andrews). Participants will be externals, enrolled into a University program which is created and managed by a team of administrators in the Bayes Centre (the funding holder of this programme). The course requires a certificate from the University for every participant. All that ITO has to do is to provide us with a course instance. The course is paid, which again is managed by the Bayes Team, including marketing and any participant management.

**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 course teaches general knowledge about theory, application, design, and evaluation of visualizations. The goal of the course is to enable participants to understand the potential of visualizations, how interactive visualization interfaces can support the workflow of data analysis, and how to create effective presentations with data visualizations.

The course will enable participants to describe a visualization problem, to explore data using visualization tools (e.g., Tableau, Rawgraphs), to discuss and design appropriate visualization concepts, to implement them using simple tools and to critically reflect on them. The course is designed for an interdisciplinary audience without requiring any pre-skills. General programming skills are not required. Besides interactive visualizations, participants can opt to create static visualizations (infographics, posters, etc).

During most of the course, participants are encouraged to work with their own data that they find relevant to themselves. Participants will go through all the stages of the data exploration and visualization design process, in alignment with the above listed learning outcomes; explore data and describe initial findings, critique the tools and list shortcomings and possible future features, create custom visualization designs for exploration or presentation, present the visualizations.

The course aims for 11 lectures, each targeting a set of principles in data visualizations, and which are organized as follows. Topics are provided as pre-recorded lectures, with a range of topics in the areas below. Each topic will include a range of short videos. The specific topics will be determined by market research, supported through the funding.

<u>Lectures and topics (2h each):</u>

1. Introduction to data visualization,
2. Visual perception, color, exploratory data analysis
3. Tools and programming environments for data visualization
4. Visualizing Statistical and Multivariate Data
5. Visualizing Trees and Networks
6. Visualizing Geographic, temporal and geo-temporal data
7. Text Visualizing
8. Data-driven storytelling and Data Journalism
9. Deception, Communication, Uncertainty Visualization
10. Interaction techniques for Data Visualization
11. Evaluating and judging visualizations

**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/ltds/assets/documents/res-writinglearningoutcomes.pdf

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

1. **Analyze:** Describe a challenge for a visualization project and the reasons why visualization is required. Break down the project considering its context (target audience, usage scenario), potential tasks that the visualization should facilitate, and the characteristics of the data set.
2. **Design**: Create a visualization through one of various media (website, interactive, infographic, etc.) and through a self-chosen set of tools. Visualization designs are meant to match an earlier identified challenge.
3. **Evaluation:** Critically reflect on a visualization design and suggest constructive solutions.
4. **Apply:** Competently apply a wide range of visualization techniques and tools, also knowing their particular features and drawbacks.

**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*

- **Problem analysis**: analyze the problem related to exploring and communicating data in a specific context
- **Critical thinking**: thinking critically about the effectiveness of data visualization for a given challenge, in a given context.
- **Creativity**: searching for (novel) alternative visualization solutions to a specific challenge
- **Visual design:** sensitivity about how to use visual design skills to improve visual communication

## 2. 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.

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| **Summary Description**<br>*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.* | This course teaches how to visually explore data and how to criticize, design and implement data visualizations. It teaches the fundamentals of human perception and data visualization, exploratory data analysis and the importance of interaction in exploration, techniques for data visualization of specific data sets (networks, temporal data, geographic data, etc..), and storytelling.<br><br>Programming knowledge and experience are not required but can be acquired and deepened throughout the course. |
| **Keywords**<br>*Give a list of searchable keywords.* | data visualisation, exploratory data analysis, visual design, data science |
| **Course Description**<br>*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.]* | This course teaches general knowledge about theory, application, design, and evaluation of visualizations. The goal of the course is to enable participants to understand the potential of visualizations and how visualization and interactive interfaces can support the workflow of data analysis and communication.<br><br>The course will enable participants to describe a visualization problem, to explore the data using visualizations, to discuss and design appropriate visualization concepts, and to implement and critically reflect on them. The course is designed for an interdisciplinary audience, targeting participants with a background in design, data analysis, and other areas. General programming skills are not required but some relevant JavaScript (D3.js, https://d3js.org) are provided during the course. During the course and for final assessment, participants can work on a visualization project of their choice, including their own data (infographics, data comics, posters, data physicalizations, virtual and mixed realty (accessed at the university campus)) or any any other form discussed in the course. Participants will have to bring their own devices. No specific hardware is require. Most tools will run in a web-browser. |

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| | During most of the course, students will work in groups of two to three students using real-world datasets they find themselves or which are provided. Groups will go through all the stages of the exploration and visualization design process, in alignment with the above listed learning outcomes; explore data and make initial findings, critique the tools and list shortcomings and possible future features, create custom visualization designs for exploration or presentation, present the visualizations.<br><br>The course aims for 11 lectures, each targeting a set of principles in data visualizations, and organized as shown below. Lectures will be held as a flipped classroom where lectures require listening to a previously recorded lecture, or reading a book chapter or representative (easy to understand) scientific paper.<br><br><u>Lecture topics:</u><br>1. **Foundations of data visualization:** Perception, visual variables, exploratory data analysis, explanatory visualization, scenarios, deception, visualization tools.<br>2. **Visualization Techniques:** visualizations for statistical data, hierarchies and networks, temporal data, geographical data, multivariate data, etc.<br>3. **Advanced topics:** data-driven storytelling, interaction techniques, evaluation techniques, geo-visualization. |
| **Assessment Weightings:**<br>*These should correspond approximately to the proportion of learning outcomes that each component assesses. More than 30% coursework requires specific justification.*<br>*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.* | Written Exam _____%<br>Practical Exam ____% (*for courses with programming exams)*<br>Coursework __100___% |
| **Further Assessment Information**<br>*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.* | 1) **A1: Critique and Redesign (not graded, for feedback only):** Participants analyze problems with a given set of visualizations and propose / sketch improvements.<br>2) **A2: Analysis and Exploration (100%)**: For a dataset of their choice, participants 1) describe a visualization problem, and consequently either 2a) motivate and create a visualization and describe insights from data (using any tool they |

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| | like, e.g., Tableau), or 2b) motivate a visualization design, apply that design using existing tools (programming or non-programming) to create a visualization in the form of their choice (infographic, data comic, interactive, video). |
| **Components of assessment and time spent on assignments (for BoS only)**<br>*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.*<br><br>*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.*<br><br>*Note that it often desirable to include formative assignments which are not formally assessed but submitted for feedback, often in combination with peer assessment.* | **A1:** Written assignment, not assessed, covering learning outcome Evaluation and Design by having participants critically reflect on existing visualization designs and create an unflawed re-design. Expected hour investment **10h.**<br><br>**A2**: Written assessment, covering learning outcomes Analyze, Design, and Application. For a dataset of their choice, participants 1) describe a visualization problem, and consequently either 2a) motivate and create a visualization and describe insights from data (using any tool they like, e.g., Tableau), or 2b) motivate a visualization design, apply that design using existing tools (programming or non-programming) to create a visualization in the form of their choice (infographic, data comic, interactive, video). **40h.** |
| **Feedback Information**<br>*Provide a high-level description of how and what type of feedback will be provided to students, for inclusion in DRPS.* | Feedback will be given to participants as<br>- oral feedback during tutorials<br>- Individual written feedback per assignment handed in.<br>- individual feedback during online forum discussions<br>- Weekly drop-in face-to-face consultation hour(s) |
| **Additional Feedback Information (for BoS use only)**<br>*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).*<br><br>*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.* | - oral feedback during tutorials<br>- individual feedback during online forum discussions<br>- Face-to-face consultation hours with students, 1h/week. |

*In general, formative feedback:*

- *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.*

**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.*

*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.*

**Contact hours**

| Hours | Type |
|---|---|
| **22** | Lecture Hours |
| **6** | Seminar/Tutorial Hours |
| - | Dissertation Project Supervision Hours |
| - | Supervised practical/Workshop/Studio hours |
| - | Feedback/Feedforward hours |
| - | Summative assessment hours |
| - | Revision Session Hours |

**Non-contact hours**

| Hours | Type |
|---|---|
| **72** | Directed Learning & Independent Learning hours |

**Total hours: 100 hours**

**Reading List/Learning Resources**

*You are encouraged to create resource lists using LEGANTO*

- Segel, Heer, Narrative Visualization, 2010, https://egerber.mech.northwestern.edu/wp-content/uploads/2015/02/Narrative_Visualization.pdf
- Bertin, Semiology of Graphics, 1987
- Nussbaumer: Storytelling with Data, 2017: http://www.storytellingwithdata.com
- Tufte: Visual Evidence: Images and Quantities, Evidence and Narrative, 1997
- Colin Ware: Information Visualization, 1999
- Tamara Munzner: Visualization Analysis & Design, 2014
- Scott Murray: Interactive Data Visualization for the Web—An Introduction to designing with D3, 2013
- Manual Lima: Visual Complexity—Mapping Patterns of Information, 2011
- Ben Shneiderman: The eyes have it: A task by data type taxonomy for information visualizations, 1996

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| | - Panday et al: How deceptive are deceptive visualizations?: An empirical analysis of common distortion techniques, 2015<br>- von Landesberger et al: Visual analysis of large graphs: state-of-the-art and future research challenges, 2011<br>- Tamara Munzner: A nested model for visualization design and validation, 2009 |

## 3. 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.

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| **Course information and publicity**<br>*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-SoI students.* | The course is based on material (e.g., recorded lectures, assignments, data sets) from three existing courses:<br>- Data Visualisation (Bach, https://datavis2020.github.io)<br>- Understanding Data Visualization (Campagnolo, http://www.drps.ed.ac.uk/19-20/dpt/cxpgsp11484.htm)<br>- Information Visualisation (Hinrichs (Univ. of St. Andrews), https://info.cs.st-andrews.ac.uk/student-handbook/modules/CS5044.html)<br>Publicity will be managed through a marketing team at Bayes as well as the networks of us instructors. The University is welcome to distribute ads for the course. |
| **Sample tutorial/lab sheet questions**<br>*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.* | Examples can be found at https://datavis2020.github.io/tutorials.html, excluding parts where discussion is needed. These 'tutorials' are meant as exercise sheets for home work and can be discussed in the online consultation sessions and in forums. |
| **Sample assessment materials**<br>*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/.*<br><br>*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.* | n/a |
| **Any other relevant materials**<br>*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.* | Participants are encouraged to use a course-specific forum as well as a public forum discussing guidelines in visualization: http://visguides.org<br><br>The course will feature a visualization tool browser, currently under development: https://ecaedacvistooltestapp.azurewebsites.net |

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| | The course will feature an extended set of visualization cheat sheets http://visualizationcheatsheets.github.io which currently will be extended to include more cheat sheets.<br><br>The course will point to set a of additional resources about<br>- books: https://visualinteractivedata.github.io/res-books.html<br>- visualization tools: https://visualinteractivedata.github.io/res-tools.html<br>- data visualization catalogs and collections: https://visualinteractivedata.github.io/res-collections.html<br><br>Other resources will be linked here: https://visualinteractivedata.github.io/resources.html |

## 4. 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.

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| **Planned Academic Year of Delivery**<br>*(The first year you anticipate the course running, e.g. AY 2019-20)* | 2019-20 |
| **Course Organiser**<br>*(By default, the course proposer)* | Benjamin Bach |
| **Intended Delivery Period** | ___Semester1<br>__Semester 2<br>___Full Year<br>_X_Summer<br>___Other (please specify): |
| **Timetable considerations/conflicts**<br>*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.* | Please avoid timetabling clashes with:<br>- n/a since online course. Tutorials will be held in the afternoon/evening. |
| **Is this course available to visiting students?** | ___Yes (default)<br>_x_No<br><br>**If no, please provide a justification here:**<br>Course will be managed through its own program to give priority to the participants enrolled in that program. |
| **Required pre-requisite courses**<br>*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.* | __X_No<br>___Yes (please specify full course name(s) and code(s)): |
| **Recommended pre-requisite courses** | _x_No<br>___Yes (please specify full course name(s) and code(s)): |
| **Required co-requisite courses**<br>*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.* | _X_No<br>___Yes (please specify full course name(s) and code(s)): |

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| **Prohibited Combinations**<br>*Specify any courses that may not be taken in combination with the proposed course].* | _X_ No<br>___ Yes (please specify full course name(s) and code(s)): |
| **Other Requirements/Additional Information**<br>*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).*<br><br>*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."* | ___ No<br>_x_ Yes (please specify):<br><br>Only open to Distance Learning students |
| **Visiting Student Pre-requisites** | _X_ Same as "other requirements"<br>___ Different than "other requirements" (please specify):<br>(not open to VUGs) |

## 5. 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.

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| **Is this course restricted to students on a specific degree?**<br>*E.g., some courses are only available to students on a specific CDT or MSc.* | ___No<br>_X__Yes (please specify and provide justification):<br>The programme is called "Data Skills Workforce Development" and managed by Bayes. |
| **Is this course compulsory for students on any degree(s)?** | __No<br>___Yes (please specify and provide justification): |
| **Any issues for part-time students?**<br>*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.* | no |

**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.

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| **Should this course be tagged as 'ML' (machine learning foundations and methods)?**<br>*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.* | __No<br>__Yes |
| **If you chose 'no', please choose at least one of the following tags…**<br>*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.* | __**FSS** (CS foundations, systems, and software)<br>__**AIA** (artificial intelligence applications and paradigms)<br>_**COG** (cognitive science: including HCI and NLP courses, but not most other AI courses. Please restrict to courses most relevant to natural cognition.) |
| **…and also tick if any of the following tags or categories apply.**<br>*Do not tick any of these if you selected 'ML' already.* | __**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.)<br>__**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.)<br>__Databases and data management systems (used for Data Science MSc and MSc(R)) |

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

## 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. Please indicate here what feedback has been solicited and received.

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| **Additional Comments**<br>*Summarise any comments received from relevant individuals prior to proposing the course. If you have not discussed this proposal with others please note this.* | |
| **Year Organiser Comments**<br>*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.]* | |
| **BoS Academic Secretary Comments**<br>*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.* | |