Rationalizing Year 3 (10pt and Level 9 courses)

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1   Overview of the proposal

Over the last several years, we have been gradually shifting our slate of Level 9 and 10 courses from a large number of 10pt courses at both Level 9 and Level 10, to a smaller number of 20pt courses, mainly at Level 10. Reasons for this change are described below, but the result is that, if no further changes are made, then in 2022/23:

- We will have only a single Level 9 optional course (Automated Reasoning). All other optional courses available to Year 3 students are (or will be) at Level 10, so they are also available to Year 4 and PGT students. AR is not, which limits potential enrolment and student choice.
- We will have one compulsory 10pt course in Semester 1 of Year 3 (Professional Issues), plus 7 optional 10pt courses available in Year 3. Students must take one of these to reach a total of 120 credits, but at present only 3-4 of them run in Semester 1. This leaves little choice, and in practice many students end up taking one of the Semester 2 options, leading to an unbalanced credit load.

This proposal aims to remedy both situations, by:

a) Changing the level of the Automated Reasoning course from Level 9 to Level 10, and deprecating Level 9 optional courses (i.e., BoS will no longer approve them in future).
b) Stipulating that all Year 3 10pt courses should be offered in Semester 1 from now on.

2   Further details for proposal part (a)

2.1   Why we should deprecate Level 9 optional courses

Due to changes in our curriculum and in the assessment regulations over the years, Level 9 courses have become increasingly inaccessible to students:

- UG students can only take them in year 3. But other curricular changes mean UG3 students have fewer optional credits than they used to (50-70), and most courses are 20pts, so students can only take a few optional courses in UG3. If "year 3" courses are offered at Level 10, then students can also take them in UG4, allowing more flexibility.
- The regulations around PGT students taking Level 9 courses have become so complicated that our School no longer permits these students to enrol in Level 9 courses. However, PGT students are still permitted to take a limited number of credits at Level 10.

In response, the School has slowly been replacing our Level 9 courses with Level 10 ones. As of 2021/22, only two Level 9 optional courses remained (IVR and AR), and the October 2021 BoS already approved a replacement IVR, which will run at Level 10. This leaves only AR, which we now propose to move to Level 10 as well.

2.2   Effects on AR and updates needed to change AR to Level 10

We hope that making AR Level 10 will help boost its enrolment, which is consistently the lowest of all UG3 optional courses. Since AR will still permit UG3 students, the change should not decrease UG4 project uptake in the area by much; if anything it should increase MSc project uptake.

We view this as primarily an administrative change, so the current course descriptor could simply be copied over to the new Level 10 course, with the following minor updates (suggested by the course organiser) to account for MSc students and to make the summary a bit more attractive by mentioning current applications.

- The required prerequisite (Inf2D) should be removed. Instead,
- The "Other requirements" box should be updated to say:

This course is open to all Informatics students including those on joint degrees. External students should seek special permission from the course organiser. This course assumes prior background as follows:

Undergraduate students must have passed Informatics 2D: Reasoning and Agents (INFR08010).

MSc students must have passed an undergraduate level course on logic (including propositional and predicate logic) and formal reasoning.

- The Course Summary box should be updated to say:

Automated Reasoning covers the theory, implementation and applications of logic-based reasoning via computers. It is one of the oldest subfields of Artificial Intelligence, originating in the mid-1950s when it was first used to reason about propositional logic. Since then, it has been applied to domains ranging from the formalisation of advanced mathematics to the formal verification of software and hardware systems.

In this course, we take an interactive approach to automated reasoning and explore how the proof assistant Isabelle can work with the user to establish mathematical correctness via a formal but human-friendly proof language. This provides a way of turning logic-based reasoning into a form of programming that can then be used (among other things) to reason about problems in mathematics, e.g. probability theory and multivariate analysis, and industrially-relevant areas e.g. the safety of autonomous systems.

2.3   No changes needed for Level 9 compulsory courses

We don't need to make any changes to the Level 9 courses that are compulsory for certain degrees: ILP and SDP (compulsory for almost all degrees) and WBPPA (compulsory for Data Science Graduate Apprenticeship degree), since these are only intended to be available to students in Year 3.

2.4   Consultation

The **UG3 student representatives** were consulted, mainly about part (b) of this proposal, but as part of that discussion they also mentioned that it would be helpful to have AR available in UG4.

Comments from the **AR course organiser** have been incorporated above, in the suggested changes to the course descriptor.

The **Year 3 organiser** was consulted and approves of these changes.

3   Further details for proposal part (b)

As of 2022/23, we will have the following 10pt Year 3 optional courses on the books:

- Four courses that have typically run in Sem 1: AR, CCS, MOB[1], EPL[2]

[[1]MOB replaces IVR from 22/23. [2]EPL has not run in recent years.]

- Three courses that have typically run in Sem 2: ADS, ITCS, ST

However, all of our students (except those on joint degrees) are required to take 10pts of Professional Issues in Semester 1, which means that in order to have a balanced credit load (60 credits each semester), they **must** choose one of the 3 or 4 Sem 1 options. Since these courses do not span a wide range of topics (mostly AI), many students end up choosing a Sem 2 option instead, despite the unbalanced load.

We propose to remedy this by simply moving all Year 3 10pt courses into Semester 1, which should improve the timetables and choices available to third year students.

3.1   Ramifications for joint degree students

Most joint degree students have the option of whether or not to take PI.

We anticipate that for students whose degrees are joint with Business or PPLS (where all Year 3 courses are 20pts), this change will also be beneficial, since they can more easily choose two of the 10pt courses (whether that includes PI or not) in the same semester.

For students whose degrees are joint with Maths, Physics, or Engineering (where there are 10pt Year 3 courses in both semesters), we do not anticipate a major positive or negative effect of this change.

3.2   Ramifications for UG4/5 and PGT students

The three courses proposed to move into Sem 1 also enrol UG4/5 and MSc students.

- Historically, for ADS and ITCS there have been relatively few of these (though UG4 numbers were higher in ITCS this year, since it didn't run last year).
- ST typically has about as many UG4 as UG3 students, and in some years it also gains MSc students fleeing from other courses in Sem 2.

Given the large number of courses available to these cohorts, it is unlikely that moving these three will have a significant impact. However, since we are also adding MOB and (if approved) AR as Sem 1 options for these cohorts, we may need to keep an eye on the semester balance of Level 11 courses and consider whether to shift one or two other courses into Semester 2. This does not seem like an urgent matter, however.

3.3   Consultation

The current **course organisers** of the three courses have been consulted, and are all willing to move their courses to Semester 1 (though the current ST CO will not be delivering the course next year).

Bjoern consulted the **UG3 student representatives** at their weekly meeting and reports that they support this change:

In principle, students thought this was fine! In fact, AR was mentioned and the problem of not being able to take AR in year 4 (which we are planning to change). Also, students are very keen to balance credit load in UG3, especially as SDP is extremely work-intensive and no-one want to take 70 credit points in S2 of UG3. Basically, this means that students are very aware of credit load and are taking this into account when making their course choices. Some students seem to have taken PI in year 4 for this reason, so these students would benefit from having 10 credit point courses in S1.

The **Year 3 organiser** was consulted and approves of these changes.