

To
The IMADA Education Committee
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Action plan after students' evaluations for DM841 - Heuristics and Constraint Programming for Dis- crete Optimization

The course was offered for the first time. It consisted of two parts, the first one on heuristic method, based on the old course DM811, and the second one on Constraint Programming, based on the old DM826. At the start of the course there were in total 10 students enrolled in BlackBoard. Of these 10, a group of 4 students were enrolled to only the first part of the course, which they took formally as an individual study activity.

The assessment of student's learning in the course was done with two graded obligatory assignments, a midterm one and a final one. For those who took the whole course, the final grade was determined by the average of the grades of the two assignments. For those who took only the first part of the course, the final grade was the grade in the midterm assignment. In addition, there were four preparatory assignments, two for the midterm and two for the final assignment. These preparatory assignments were obligatory and used to provide feedback by the teacher but did not contribute to the final grade. This overall assessment format was agreed upon with the participants at the beginning of the course.

All assignments (except one) were programming activities in C++. For the part on heuristics we used the framework EasyLocal, for the Constraint Programming part we used the library Gecode. We had a guest lecturer for one week to explain EasyLocal and introduce C++.

The midterm student evaluation of the course was done using the Delphi method. The final evaluation was done by means of an electronic questionnaire. All 4 students who took only the first part of the course passed the course with grades: 10, 10, 10, 4. At

the time of writing, I did not receive the submissions of the final project. I expect 5 students to submit, as this is the number of students who fulfilled all requirements.

The main comments that arise from both the midterm and the final evaluation are the following:

- The teacher's competencies are perceived as satisfactory.
- The assessment form was perceived as fair and appropriate for the goals of the course.
- The assignments could be improved if they were made less open but rather based on more specific and detailed questions. Sometimes it was perceived as unclear what was exactly expected by the students.
- "EasyLocal provides a nice understanding of heuristics, but the learning curve is very steep, because you have to know the entire framework before you can use it. The guest lecturer was very helpful in this respect."
- The course, above all in the heuristic part, implies a considerable amount of programming work, which is time demanding.
- The course was perceived as stimulating however one student reports that after the course his interest for the field of study was lower than at the beginning.

My perception is concordant to students' response. In the heuristic part, I observed that the complexity and originality of the solutions implemented diminished with respect to the previous years. Moreover, also the time I had to discuss theoretical issues in class became less. The EasyLocal framework ended up requiring too much attention, moving time usage away from the main content of the course.

In the light of these comments, for the next edition, I plan to simplify the framework for the heuristic part writing a lighter version of EasyLocal, easier to install and to work with. It will still be in C++ but I will spend one week of the course to introduce the language with examples on the framework.

Moreover, I will make assignments with more specific questions, possibly with clearly indicated hot spots where specific code has to be added. The overall tasks may remain the same but they can be split down into detailed subtasks. I will maintain the same assessment format made of preparatory assignments plus graded assignments. I will also separate the deadline for the submission of programming tasks and the one for the submission of a report.

This distinction seemed to work well in the midterm assignment.

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