

MSCI 435 Group Projects

The project consists of modeling, devising a solution methodology, and implementing an optimization engine for instructor-course scheduling.

You will find attached sample copies of MGTE schedules to get an idea about the optimization problem.

Your task is to

- a. Understand the problem and provide a mathematical formulation. Try to provide formulation that you think will handle large sizes (hint: set covering type)
- b. Use decomposition concepts learned in class and/or heuristic methods to solve the problem
- c. Devise a solution methodology for the scheduling problem
- d. Test the approach for the schedules given attached. To validate your approach, you can test on schedules of other UW Engineering programs, available online.
- e. Explore different strategies
- f. Carry out testing and comparison, providing tables/graphs comparing different approaches.
Most importantly, you must provide a schedule and compare it with the attached schedule.
- g. Write a report.
- h. Prepare a 10 min presentation.

For the implementation, you can use any software you want, but you are highly recommended to use R in order to use some of the codes/scripts developed in class.

The **grading** of the project will depend on

- a. the extent to which you applied material learned in the course
- b. the sophistication and quality of the proposed approach(es)
- c. the quality of the implementation and testing
- d. the quality of the presentation and written reports

Steps and deadlines

1. Due Wednesday March 15th (in class): A progress report defining the problem, detailing the mathematical model and solution methodologies chosen (*Min 1 page, max 2 pages*).
2. Tuesday April 3rd (in class). In class presentations: You are expected to present the model, the formulation used, the methodologies, and the results achieved. You will be given exactly 10 minutes to make your presentation. You are required to send me your presentation before midnight on April 2nd. I will have all of them in one file, so that you simply present it when your presentation is up on the board.
3. Due Wednesday April 4th (to Paulo): Final reports. Reports should not exceed 7 pages, be concise and to the point. Detailed output, code listings, etc. should be put in an appendix. Only provide summary results in the body of the report (e.g. in table or figure formats). Send a copy of your code to the instructor and the TA.