**SEMESTER PROJECT**

# A. Research Paper

You may choose a specific topic in the area of discrete optimization and explore it in greater detail. This type of project should survey the existing literature, identify a problem (or a gap) to be researched, present existing methods for solving the problem, and in some cases develop an improved solution approach (e.g., an algorithm). *(Of course, improvements of the existing algorithms will be an asset!)*

# B. Application Project

You need to describe the problem considered for your project and propose a model and/or solution approach for solving the problem using ***decomposition techniques discussed in class, i.e., Benders’ decomposition and/or Lagrangian decomposition***. Ideally, the project could be based on an industrial application. For industrial projects the emphasis should be given on the problem statement and a mathematical model developed, as those might be relatively difficult to accomplish. If you do not have an industrial project, you may want to select a problem from a published journal. For the journal selected project you are expected to present a model of the problem and a solution procedure. Make attempt to consider alternatives while proposing design solutions, show the benefits and pitfalls of each alternative, and use visualization tools to demonstrate the results.

A list of journals you may want to consider for your project includes *Interfaces, Expert Systems with Applications, Computers & Industrial Engineering, International Journal of Industrial Engineering,* *IIE Transactions*, *Journal of Manufacturing Systems*, *International Journal of Production Research*, *Journal of* *Intelligent Manufacturing, Computers & Operations Research*, *European Journal of Operational Research, etc.*

# SEMESTER PROJECT REPORT FORMAT

The project report should be prepared on a word processor and should contain figures and tables that are necessary to make the report easy to read. Be concise in your writing and consult technical writing references as needed.

Your report will be formatted with the following traits:

* The title page should include the title of the project, student name, course title, and the date. The title page should be followed by an abstract (executive summary). Include also a table of contents, a list of figures, and a list of tables.
* All references must be included at the end of the paper, followed by appendices, if any.
* There is no page limit but the project report should be at least 10 pages long, singlespaced throughout
* Use a standard font (Times New Roman 12).
* Use 1 inch margins for top, bottom, left, and right.
* Use proper punctuation, spelling, and grammar.
* All pages (with the exception of the title page) should be numbered.

The body of the semester project report should include the sections outlined as follows:

## A. Research Paper

1. Abstract (about 100 words)
2. Introduction (including statement of the problem and some problem issues)
3. Literature review
4. Existing models and solution approaches *(Option)*
5. Proposed model and/or solution approach *(Option)*
6. Examples *(Option)*
7. Conclusions and future research
8. References

## B. Application Project

1. Abstract (about 100 words)
2. Introduction (including problem definition and project goals)
3. Model formulation
4. Solution approach *(Option)*
5. Example
6. Conclusions and future research
7. References

While writing the report, you have to think about the following questions: What is the goal of your project? What research has been done? How was it presented in the written report? Did the results support the main idea of the project? Was the argument convincing, or did more work need to be done? Who is the intended audience and how could the results of your project be used for them?

# PROJECT REQUIREMENTS

## Project proposal submission (<500 words) that includes:

* The topic of your project
* Brief description of idea, i.e., what you plan to do and how
* Expected results (you hope to obtain)

## Project written report submission

* An MS office word file with project report
* A set of pdf files with references used
* Software developed (when applicable)

## Project presentation

* The project presentation should contain figures and tables that are necessary to make the presentation easy to understand.
* Should submit presentation slides together with their written report (see the project written report submission requirements section above).

* The following item will be considered while scoring written report:
  + Organization (information is presented in a logical, interesting way, which is easy to follow. Also, points are logically ordered) o Quality of information (supporting details specific to subject, clarity of writing)
  + Literacy (virtually no grammatical or syntactical errors). This is a threshold category, and you can be marked down significantly if your report does not meet a minimum standard.
  + Length of report