MIE Department
J. MacGregor Smith
Umass Amherst Campus
Fall 2009

MIE 379 TERM PROJECT ASSIGNMENT

PURPOSE:

Group assignment: Limit of 2-3 people to a group

Select an operating system (or subsystem) within which there is an optimal production planning, scheduling, layout and location, design, inventory, blending, transportation, assignment or related set of decision and planning problems. Choose one important problem for which some system improvement would be desirable. On campus or off-campus systems are possible.

Ideally, the choice of the specific problem would be suggested by the client or owner of the system. Refer to the textbook and the web along with the appendices of the textbook and the case studies for additional insights into types of generic mathematical programming system problems for possible study. The projects do not need to be confined to linear programming, but linear programming will be emphasized in this course. If there are nonlinear relationships between variables or integer variables, then you should determine how you will deal with these. Even though certain applications may be integer, the use of LP should be encouraged and modelling should be creatively suggested.

Carefully determine the objective function(s), decision variables, and constraints of the problem.

If you are unable to come up with a suitable project, then I will suggest something, although it is best if you discover and elucidate the problem for the project.

Collect data on the operations of the system so that you can attempt to obtain estimates of the data and variables of interest. Hopefully, the client (if possible) may be able to provide the data for you.

Your final typewritten project report should include the following sections:

• I. Introduction (Background) – a clear description of the system under study and the purpose of your study. What are you attempting to accomplish and what measures of effectiveness are to be used?
• II. Data collection and analyses – what data were collected and how? What analyses were performed? The raw data should be organized and tabulated in an appendix.
• III. Development of optimal (if possible) or good operating policies – how would you proceed to obtain improved operating policies for the system? Utilizing the system such as AMPL or Mathematica to perform experiments is highly recommended in order to determine the optimal operating policies of your system. Perform some limited sensitivity analysis to underscore your results.
• IV. Conclusions and recommendations – what conclusions can you make from your analyses? What do you recommend be done – to improve the system and/or for future work?

REQUIREMENTS:

As a first step in the project, I would like a one page typewritten description of the project proposed by September 29th 2009. This proposal will be evaluated as part of your term project assignment which will be due at the end of the semester in the second week of on or about December 11th.

You will be evaluated based upon the following criteria:

○ Creativity and originality of your problem and its formulation;
○ Thoroughness and completeness of your results;
○ Correctness of your results;
○ Communication, Clarity, and Quality of your overall presentation.