

Math/Mgmt 3502 (Ng/Fall 2007)  
**Course Project**  
 October 25, 2007  
**Report Due by 11:00am on Friday Dec 7, 2007.**

This project assignment is to expose Math/Mgmt 3501 – 3502 students to real world applications of the modeling and analysis approaches we studied in these courses.

One way to do this is for you to find and report on a journal article about a real application of **deterministic** or **non-deterministic** management science models, or of any one of the specific topics covered in class this semester. (Look ahead into your syllabus to see the topics.) You are also required to give an oral presentation.

**Note:** This project is to be done in an independent manner, i.e., I will **not** be directly involved in your interpretation nor your write-up of your report. However, I am willing to render suggestions and comments before and concerning the oral presentation.

Your article of choice **MUST** be agreed upon by you, your partner, and me (the instructor) by **November 7**. Some rules and regulations are given below.

**Your Project's Grade:** Your project consists of two parts, namely, a written report and an oral presentation in class, each of which is graded on a basis of *50 points*.

**Your Written Report:** Of the total of *50 points*, 10 points will be for neatness and organization of your written presentation, with the rest for substance. Your report should describe the formulation and analysis of one of the models in the paper (sometimes there are several), or of the problem you are working on.

- What was the problem being modeled? Briefly tell the story.
- What type of models or techniques were considered? (*LP, ILP, MILP, Network Models, CPM – PERT, Decision models, Queueing models, etc.*)
  - input and output variables
  - decision variables
  - objective functions or cost matrices or constraints
- What optimization methods were used to analyze the model? If a special analytic procedure was created for the study, briefly explain it.
- What results came (could come) from application of the model and optimization method? For example, was a million dollars saved by implementing the results? If it was not implemented in a real organization, are results provided for a case example, etc?

**Format:** Your report should consist of several ( $\approx 10 - 15$ ) neat pages, with text typed. You may hand write mathematics, tables and figures if they are neat.

Clarity and organization of the paper is important. In particular, your report should have the following outline structure, preferably in sections:

- Description of the problem, including some motivation as to why the problem is worth looking at (according to you or others).
- The approach to solving the problem.
- Results
- Analysis or conclusions.

*Attach a xerox copy of the journal paper reviewed to your report when you submit it.* If you wish to retain a copy of your report, make one before you turn it in. All reports will be kept by the Math Discipline for UMM Assessment purposes only, and a “Scoring and Comments” sheet will be returned.

Bibliography or references **must** be used and they can be in any format as long as they are well-documented with authors, dates and the source. (WWW URLs alone is **NOT** sufficient.)

**Oral Presentation:** You and your partner will be responsible for preparing a 12 to 15 minutes talk in class about the article in your report or your project. This talk is intended to give you a chance to present some complicated ideas in such a way that your audience (who may or may not be knowledgeable in this area) will at least be able to grasp the big picture of the work you are doing.

The talk is preferably a non-technical one. Just think of how you would present the problem and the ideas to your learned colleagues (who are not versed in management science) in a firm or company.

Your oral presentation should be prepared with a similar outline as in your written report, however, you should only stress on the main points. Think about how to **communicate** the problems and solutions in the paper to an audience who is not familiar with the topics.

A copy of the presentation's evaluation can be found on your course's web page.

**Finding a Paper:** The first task of the assignment is to locate and make a xerox copy of the paper you wish to report on. The journal called **Management Science** is available at the UMM's Briggs Library. However, I highly recommend a journal called **Interfaces** which has more practitioners' articles, and which is a little more readable. This latter journal is available at the Briggs library and also at my office (Sci 2330) (for some of the earlier volumes).

JOURNAL	WHERE AVAILABLE
Interfaces	Briggs library & U of M Library
Operations Research	Briggs library & U of M Library
Management Science	Briggs Library & U of M Library

As mentioned above, *Interfaces* is only about applications, and others cover some applications in sections called "O.R. Practice", "Cases", or "Applied Papers", etc. *Interfaces* has proven to be the most useful, and it is the one highly recommended by me.

**Acceptable Papers:** To be acceptable, the article you choose must meet certain ground rules:

- The article need not have appeared in one of the journals listed above, but it must have appeared in a publicly printed journal available in libraries within the University System of Minnesota.
- The article must describe a realistic application setting. It need *not* name a specific organization where the work was applied, but it should be clear the authors are thinking about solving a real problem rather than demonstrating their analysis ideas on a bogus one.
- The article must describe formulation and analysis of a *concise, deterministic or probabilistic management science or operations research model*. The entire model need not be present in the paper, but enough information should be provided for you to see its structure and be able to write it down on a page or two.
- **Nonduplication.** *Each group of students (1 or 2) must find and report on a different article.* To control duplication, the article that each student ( or pair if partners) chooses **must be approved** by me. Thus, you should start this assignment **early!**

**Cooperation:** Be responsible in your use of the library. When you remove a journal from the rack, please do NOT reshelve them, but put them in the carts nearby.

#### Samples of appropriate articles that have been used

JOURNAL	ISSUE	(short) TITLE
Interfaces	Vol 16, No.4, 1986, p47	Optimal Ship routing...
Interfaces	Vol 21, No.6, 1991, p66	LP used for valuation..
Interfaces	Vol 16, No.6, 1986, p77	Modeling and analysis...
Interfaces	Vol 20, No.2, 1990, p21	Management science improves..
Interfaces	Vol 21, No.1, 1991, p42	American Airlines arrival...
Interfaces	Vol 14, No.5, 1984, p67	National forest Planning...
Interfaces	Vol 18, No.2, 1988, p10	Optimizing wood procurement...
Interfaces	Vol 21, No.4, 1991, p63	Estimating loads of aircraft in...
Interfaces	Vol 17, No.4, 1987, p27	RRSP Flood: LP to the rescue
Operations Research	Vol 40, No.6, 1992, p1040	A model for making project funding ...
Interfaces	Vol 8, No.2, 1978, p38	Portfolios to satisfy damage judgements...