IE 490 – Supply Chain Reliability and Robustness
Tentative Outline

Topic	Title

1   **Course Requirements and Introduction to supply chains**
  i.   Overview of Supply Chain network design (Chopra 2003; Jüttner et al. 2003; Peck and Jüttner 2002; Sheffi 2005)
  ii. Book on resilience: (Sheffi 2005)
  iii. Qualitative papers on supply chain reliability (Elkins et al. 2005; Jüttner et al. 2003; Peck and Jüttner 2002)

2   **Flexibility**
  i.   (Bish et al. 2005; Graves and Tomlin 2003; Jordan and Graves 1995)
  ii. (Bish et al. 2005; Graves and Tomlin 2003)

3   **Stochastic Programming and Bilevel Optimization**
  i.   Tutorial on Stochastic Programming (Higle 2005)
  ii. Bilevel optimization (Bard 1983; Moore and Bard 1990)

4   **Network Interdiction**
  i.   Tutorial (Brown et al. 2005)
  ii. Deterministic Network Interdiction (Israeli and Wood 2002), (Carlyle and Wood 2005) (Wood 1993)
  iii. Stochastic Network Interdiction: (Cormican et al. 1998; Held et al. 2005; Held and Woodruff 2004)

5   **Inventory Management**
  i.   Basic Paper: (Chopra et al. 2005)
  ii. More Advanced Papers: (Tomlin 2005; Tomlin and Wang 2005)

6   **Facility Location and Network Design**
  i.   Random Failures: (Snyder and Daskin 2005a; Snyder and Daskin 2005b; Snyder et al. 2005)
  ii. Attacks: (Scaparra and Church 2005a; Scaparra and Church 2005b)

INSTRUCTOR

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Office hours: M W, F 3-5; **or any other time** by appointment. I am serious about the **any other time** part. It is quite possible that these hours will not be convenient for some of you, so please just send me an e-mail to set up an appointment if you need/want to see me!

Course Requirements

The major requirement of the course is a term project to be completed by each student. The term project must include the following three key components:

a) The project must represent a **real problem** and use **real data**. Data may be obtained either from a company with which you are familiar and/or from publicly available data sources (e.g., the web)

b) The project should include the development, testing and application of some **model** to the problem.

c) The project should present clear **conclusions** about both the problem (and how, if at all, to make the supply chain more robust or resilient or reliable) and about the methodology you used to model the problem and the approach used to solve the model.

There will be three key deadlines for the project:

► Thursday, January 19, 2006 – short one-page **proposal** for the project is to be submitted identifying the problem and the likely data sources

► Week of February 7 and 9 – students are to present a short (10-15 minute) overview of the problem and the progress they have made, as well as identify any roadblocks that you may have encountered. This is to be a Powerpoint **presentation** for the class.

► March 7, 9 (and 14 if need be) – Students are to present a 20-minute **presentation** of their project results.

Finally, in addition to the final presentation, students should submit a 15-25 page (double-spaced) **paper** summarizing the problem, the model, the data, the analysis using the model, and the conclusions.

Course Requirements (continued)

In addition, each student (or possibly a pair of students) will be required to present one of the papers identified above to the class. The presentation should be broken into two parts: (i) an initial overview of the problem and (ii) a more technical summary of the modeling approach.

NU Disability Policy

(For further information, please check the following web site: http://www.northwestern.edu/disability/index.html)

Northwestern University is proud to welcome and support a diverse student body. By removing some of the barriers to education that students with disabilities often experience, we hope to create a learning environment that encourages and challenges all students.

Northwestern University provides a variety of services to assist students with disabilities in becoming active members of the University community. Services vary according to the type and level of impairment experienced by each student. The majority of these services are coordinated by the Office of Services for Students with Disabilities (SSD).

Appropriate services and accommodations are determined on a case-by-case basis. Students with questions about eligibility for services are encouraged to contact SSD. Depending on students' needs and limitations, documentation, history of accommodations and educational environment, SSD may provide the following as appropriate: scribe and reader services; note-taking services; materials in e-text and audio format; testing accommodations, such as extended time and alternative test environment; interpreter and captioning services; assistance in activity relocation; assistance in obtaining elevator and lift keys; access to adaptive equipment and software.

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