IENG 493D/593D: Transportation Logistics – Fall 2019

Prerequisites:
IENG 350   Introduction to Operations Research

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                    Office: 333 Engineering Sciences Building
                    Office Hours: MW 3:30-5pm or by appointment (I am available to answer your questions via email and will usually respond in the same day. Please note that it is often difficult to explain mathematical problems via email. You are highly encouraged to stop by during office hours or make an appointment.)

Class Meeting Schedule: MW 2:00 – 3:15pm   Room: ESB-201

Text Books:
Ghiani, Laporte, and Musmanno (2013). Introduction to Logistics Systems Planning and Control, 2nd Edition, John-Wiley.

Course Description:

This course will provide an overview of the principals involved in design and operation of supply chain and logistics systems, including the components of logistics systems (e.g. supplies, storage, material handling, inventory, orders, freight transportation systems) and the interaction between these components. There is a strong emphasis on quantitative models and techniques for the analysis of logistics systems.

Student Learning Outcomes:

Upon completing the course, the student will be able to:

   a) Understand and think creatively about the issues in logistics systems design and operations.
   b) Interpret and analyze costs in logistics system.
   c) Choose, develop, modify, and analyze mathematical decision support models for logistics system design and supply chain management.
   d) Implement logistics system decision models using optimization tools.
   e) Critique academic research in supply chain management and logistics planning.

Course Relationship to Program Educational Outcomes:

The course relates strongly to the following program educational outcomes:

1. The course enables the students to acquire the ability to use modern and classical industrial engineering methodologies pertaining to transportation and logistics planning (Outcome 1). The key abilities the students will acquire are as below:

a) Linear programming
b) Transportation and assignment problems
c) Learn and use a computer programming language
d) Evaluation of multiple alternatives

2. The course enables the students to apply knowledge of math, science, and general engineering (Outcome 2). The key abilities the students will acquire are as below:
   a) General engineering principles in modeling production and service systems.

3. The course enables the students to acquire the ability to shape materials handling system design recommendations so that results will be achieved and communicate findings effectively (Outcome 3). The key abilities the students will acquire are as below:
   a) Analyze and interpret system data.
   b) Develop recommendations that are specific, practical, and cost effective and communicate their recommendations orally and in written reports.
   c) Conduct an analysis of different alternatives and make appropriate recommendation.
   d) Gather information from a variety of sources including publications, the internet, and reference materials.

4. The course enables the students to acquire the ability to work individually and on teams to identify, formulate and solve problems in transportation and logistics systems design (Outcome 4). The key abilities the students will acquire are as below:
   a) Identify, formulate, and solve problems.

Course Topics:
Supply chain and logistics: Supply chain operations, network design, aggregate planning, inventory management, routing and scheduling, difference between supply chain and logistics.

Logistic systems and their components: Components of logistics systems and their interaction, key decisions regarding order processing, inventory management, and freight transportation considered by logistics firms.

Transportation market: Costs and decisions associated with freight transportation, modes of transportation differences, modes/carriers choice decisions for moving freight.

Carrier operations, short-haul freight transportation: Loading, routing, and scheduling vehicles to pick-up and deliver freight in a relatively small area. Models: Shortest path problem, travelling salesman problem, bin packing problem, and vehicle routing problem.

Carrier operations, long-haul freight transportation: Fleet compositions decisions, moving freight from its origin to its destination over a network of transportation services by a carrier, and the relevant costs, empty vehicles repositioning, assigning drivers, and load planning. Models: fleet composition, minimum cost flow, fixed charge network design, vehicle allocation problem, and driver assignment problem.

Logistics network design: Facility location and demand allocation across multiple facilities. Models: location-allocation models, p-center, and location-covering models.

Grading:

ITEM	Undergrad Weight	Grad Weight
Assignments	20	15
Presentations	10	15
Mid-term exam 1	20	15
Mid-term exam 2	20	15
Final exam	30	25
Term Paper	NA	15
Total	100	100

Letter Grade	Undergrad	Grad
A+	[92-100]	[94-100]
A	[88,92)	[90,94)
B+	[82,88)	[84,90)
B	[78-82)	[80,84)
C+	[72-78)	[74,80)
C	[68-72)	[70,74)
D+	[62-68)	[64,70)
D	[58-62)	[60,64)

Course Policies:

➢ Academic Integrity

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Catalog at http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/#academicintegritytext .

Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

➢ Exams

There will be three exams for this class (two midterms and a final exam). All exam problems demand both answers and work showing the complete solution procedure for full credits. Calculators are permitted in all exams. Exams will cover reading material, material discussed in class, and the assignments. The exams will be cumulative. Make-up tests will be given if (i) a legitimate, documented excuse is provided (e.g. personal sickness, emergencies, or university-related trips), and (ii) the excuse and supporting documentation are provided either prior to the test date. Events such as interviews and committee meetings do not constitute legitimate reasons. Make-up tests will not be given if these conditions are not met.
- Midterm Exam 1: 09/30/2019
- Midterm Exam 2: 11/04/2019
- Comprehensive Final Exam: 12/16/2019   11:00am-1:00pm

- Term paper and assignments for graduate students enrolled in IENG 593 SPTP will be at a much higher level including critical reviews of research papers, literature reviews that are more exhaustive, and/or modeling of existing research to replicate results from the literature.

- Homework

Homework is assigned as individual work unless specifically stated otherwise. Students are allowed to discuss homework among themselves; however, each student must submit his/her own work. Homework assignments must be submitted in class, at the start of class, and in hardcopy form, unless prior arrangements have been made with course instructor. Late submission of the homework will result in losing 20% of the full assignment grade per day.

- Re-grade

Requests for re-grades of exams and homework assignments must be submitted to the course instructor, in writing, within SEVEN days of the date the work was returned to the student. Your query must include a cover page clearly describing the portion you wish to have re-evaluated, a description of why you think you should receive credit, and should include the exam or assignment in question. The instructor reserves the right to re-grade any other section of the work as deemed appropriate.

- Communication

Course announcements, information, assignments, and documents will be posted on electronic blackboard. Students are expected to check email and blackboard regularly.

Statement on Social Justice:

West Virginia University is committed to social justice. I concur with that commitment. I expect to foster a nurturing learning environment that is based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, you must make appropriate arrangements through Disability Services (293-6700). They will identify the nature of the accommodation your disability requires.

Accommodation:

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Miscellaneous:
This syllabus is subject to change.