

TTE 4300/5305 Transportation Systems Analysis

1. **Catalog Description (including credit hours)** - This course integrates basic concepts and tools of systems analysis, including those of microeconomics, optimization, project evaluation and decision making, into transportation planning and management (3 credit hours)
2. **Pre-requisites and Co-requisites** - TTE 4004 or equivalent, or consent of instructor.
3. **Course Objectives**
 - To develop a “systems perspective” necessary for intelligent planning and management of transportation systems;
 - To explore a set of quantitative tools of great value to transportation analysts and decision makers;
 - To foster a critical perspective of the limitations of these tools when applied to the field of transportation systems analysis.
4. **Contribution of Course to Meeting the Professional Component** - This course contributes to enhancing the student’s abilities to understand, analyze, and design transportation systems. Its content is 67% engineering science and 33% engineering design.
5. **Relationship of Course to Program Outcomes** – This course requires the student to apply knowledge of mathematics, science and engineering to solve transportation engineering and systems problems. The systems perspective developed along this course fosters the ability to design systems and components to meet desired needs, and allows the student to understand the impact of engineering solutions in a global and societal context. The student will explore a set of state-of-the-art problem-solving tools and techniques, necessary for contemporary engineering practice. Six sets of problems and two examinations require the ability to identify, formulate and solve engineering problems.
6. **Instructor**

Dr. Lili Du
Office: Weil Hall 512D
Tel: 352-2947805
Email: lilidu@ufl.edu
Web: <https://www.essie.ufl.edu/~lilidu>
Office Hours: please do it by appointment
7. **Teaching Assistant**

Jiahua Qiu and Stephen Spana
Office: Weil Hall 511A
Email: jq22@ufl.edu;
sspana@ufl.edu
Office Hours: **TBD**

8. **Meeting Times** - MW, Period 8 - 9 (3:00 PM - 4:15 PM)

9. **Class Schedule** - Two sessions per week lasting 75 minutes each

10. **Meeting Location** – WEIL 0238

11. **Material and Supply Fees** - None

12. **Textbooks Required** - Course slides

13. **Recommended Reading**

- Richard de Neufville. *Applied Systems Analysis: Engineering Planning and Technology Management*, McGraw-Hill Publishing Company, 1990, ISBN: 0-07-016372-3.
- Varian, Hal. *Intermediate Microeconomics: A Modern Approach, 9th Editions*, W.W Norton & Company, 1990-2014, ISBN: 0393123960.
- Manheim, Marvin. *Fundamentals of Transportation Systems Analysis, Volume 1: Basic Concept*, The MIT Press, 1979, ISBN: 0-262-13129-3.
- Sheffi, Yosef. *Urban Transportation Networks: Equilibrium Analysis with Mathematical Programming Methods*, Prentice-Hall Inc, 1984, ISBN: 0-13-939729-9.

14. **Course Outline** (Tentative; subject to changes according to the actual prg)

Week	Date	Topic	Assignment
1	8/31 (M)	L1: Course Introduction	
	9/2	L2: Paradigm of Transportation Systems Analysis	A#1 out
2	9/7	Labor Day, No Class	
	9/9	L3: Paradigm of Transportation Systems Analysis	
3	9/14	L4: Paradigm of Transportation Systems Analysis	
	9/16	L5: Paradigm of Transportation Systems Analysis	
4	9/21	L6: Overview of Optimization	A#1 due; A#2 out
	9/23	L7: Formulating Optimization Problems	
5	9/28	L8: Unconstrained Optimization	
	9/30	L9: Constrained Optimization	
6	10/5	L10: Constrained Optimization	
	10/7	L11: Preferences and Utility	A#2 due, A#3 out
7	10/12	L12: Individual Demand Function	
	10/14	L13: Market Demand Function	
8	10/19	L14: Discrete Choice	
	10/21	L15: Travel Demand	
9	10/26	L16: Midterm Review	A#3 due
	10/28	Midterm Exam	
10	11/02	L17: Cost Minimization	A#4 out
	11/04	L18: Cost Functions	
11	11/09	L19: Cost Functions in Transportation	
	11/11	Holiday no class	

12	11/16	L20: Transportation Network Equilibrium	A#4 due; A#5 out
	11/18	L21: User Equilibrium	
13	11/23	L22: System Optimum	
	11/25	Thanksgiving Holiday, No Class	
14	11/30	L23: Project Evaluation	
	12/02	L24: Cost-Benefit Analysis	
		L25: Decision Analysis (Optional) or Review	
15	12/07	Final Exam	A#5 due

15. Attendance and Expectations

- a. Attendance:
Class attendance is encouraged. Note that 10% of the grade for the class is based on class attendance and participation. Any absence should be coordinated in advance, if possible.
- b. Class Room Procedures:
Cell phone use during class is strictly prohibited, and all cell phones should be silent during class.
- c. Additional Instruction:
If you are having a difficult time understanding a concept, please coordinate a time with me for additional instruction.
- d. Written Submissions:
A significant part of engineering is written communication. Heavy emphasis will be placed on the clarity, organization and readability of your work. The assignments and reports must be neatly presented. All information extracted from external references (journals, books, etc.) must have appropriate notation and bibliographic citations. Assistance from other students or instructors must be properly acknowledged as a parenthetical note and a proper bibliographic citation.

16. Grading

- Five problem sets: 40 points
 - Finish independently
 - Homework due in class
 - Submitted to TA (Jiahua Qiu) by email before the class on the due **date**
 - No late submission permitted. If not, the submission within the due date is still acceptable, but with 5% take-off. After that, no submission will be accepted)
- Class attendance and participation: 10 points
- A midterm exam: 25 points
 - Online exam proctored by HonorLock
 - Finish within a given time window independently
- A final exam: 25 points
 - Online exam proctored by HonorLock
 - Finish within a given time window independently

17. Grading Scale

Less than 55 = D+; 55-60 = C-; 60-65 = C; 65-75 = C+; 75-80 = B-; 80-85 = B; 85-90 = B+; 90-95=A-; 95-100= A.

“Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>”

18. Make-up Exam Policy - None

19. Honesty Policy - All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others. For UF’s Honor Code page, please visit:

<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

20. Accommodation for Students with Disabilities - Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services - Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

22. Software Use - All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

23. Diversity Statement - The Herbert Wertheim College of Engineering (HWCOE) values a diverse and inclusive community. It is integral to success in every area of our college. Therefore, the College is committed to non-discrimination with respect to all areas of human differences, including but not limited to national and ethnic origin,

race, age, sex, sexual orientation, gender identity and expression, beliefs and opinions, religion and faiths, culture, socio-economic background, level of physical or mental ability, and veteran's status. This commitment applies in all areas—to students, faculty, and staff and intends to reflect the College's belief that educational and employment decisions and access to University activities should be based on an individual's abilities and qualifications.

The HWCOE values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. We aspire to educate students to become future leaders capable of creating diverse and inclusive work cultures wherever their careers may take them.

24. **Privacy related issues statement for online lecture:** Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.