

**WUHAN UNIVERSITY OF TECHNOLOGY**  
**ITS Research Center**  
**Fall 2016 - Course Outline**

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**Course Information**

Title: **CE 6210 - *Spatial Economic Modeling for Integrated Land Use Transportation Planning***, 3ch, (3C 2L)

When/Where: Lectures will be held in RM 801, **Navigation Bld.**, Fridays, 10:30 am - 12:30 pm

Instructor: Ming Zhong, Ph.D., P.Eng. RM 801, Navigation Building  
Office Hours: By arrangement with the instructor

Webpage: [http://whut.edu20.org/teacher\\_lesson/show/598245?lesson=1](http://whut.edu20.org/teacher_lesson/show/598245?lesson=1)

**Course Objectives**

Traditional urban transportation planning lacks analysis of evolvments of surrounding land use pattern and corresponding economic activities and therefore, has a weak base for addressing a variety of issues, such as urban sprawl, alternative economy/land development plans, traffic congestion, and air pollution. Therefore, this course is to introduce some spatial economic models that can be used in integrated transportation and land use planning to address these issues. Related concepts and procedures will be introduced and discussed and a series of such models used particularly for integrated land use and transportation planning will be reviewed.

**Course Requirements**

- ☐ Students must have successfully completed CE6203 – The Theory of Transportation Systems Planning.
- ☐ Interest in subject, participation in classes and completion of assignments are required.

**Marks**

*Marking Scheme:* The final grade will be based on marks earned for the following milestones:

- |  |                                |
|--|--------------------------------|
| 1. Proposal for the term project                       | 5% (1% for oral presentation)  |
| 2. Position paper                                      | 10% (2% for oral presentation) |
| 3. Term Project  | 75% (5% for oral presentation) |
| 4. Discretionary amount of class attendance and inputs | 10%                            |

F will be awarded to those having marks below 50, D below 55 etcetera. An A<sup>+</sup> will be awarded to marks above 90 percent.

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Submission of all assignments and labs must take place at the due time specified on the Blackboard. Late submissions within 24 hours of the deadline will receive at 50% penalty. Late submissions after this time, will receive a 100% penalty. Penalties will be applied to the mark attained. Plagiarism will be dealt with according to University Regulations (Section IX).

#### ***Proposal, Position Paper and Term Project (85%):***

A one-page proposal for your term project should be submitted to the instructor within 3-4 weeks after the course starts. When selecting the topics, subsequent implementations in the term projects should be considered. ***The best topic would be the one (1) that uses an integrated modeling framework in your research or (2) how your research is going to solve a problem of or improve an integrated model.*** Topics selected by students should be related to individuals' research areas and discussed with the instructor.

A position paper will be developed by each student after you submit your proposal. It should cover a modeling framework and document its history (previous applications) and current developments. Students should endeavor to give an overview of the framework selected and discuss why it fits the problem at hand. Students are expected to pay special attention to the modeling structure and components. The position paper is expected to finish by the middle of the semester (around Feb. 20<sup>th</sup>).

Each student, working individually, will undertake a Term Project. The project will involve using a framework selected to design an integrated land use transport model, including its sub-modules, input/output of each module and data requirements/sources. The students should provide details about the above aspects and discuss how the problem identified in your proposal can be addressed with such a model. Basically, the idea is to help you **design** such a “hypothetical” model based on the selected framework, which is ready for future implementation (please note that, due to the limited time within a semester, you are NOT required to carry out any “real” data collection and model development work). Submit your final report as a Word document, in the suggested format outlined at the end of this document by 5 pm the last day of the term (or a date specified otherwise by the instructor). The following aspects should be addressed in your report in addition to other work:

- Discuss the problem at hand
- Explain why an integrated land use transport model fits the problem
- Discuss why you select a particular framework (e.g., MUSSA vs. TRANUS vs. PECAS)
- Discuss a desired modeling structure and related sub-modules you think it should have
- List the data required for each sub-module, the sources of such data, and the relationship among these sub-modules
- Discuss an implementation plan and the significance of your work

- Discuss the strengths and weaknesses of the framework you have selected as the base of your term project when compared to other ones.

Each student is requested to develop PowerPoint files and present their findings and thoughts for class discussion during various points of the term. One presentation will be scheduled right after the students submitted their position paper to discuss why she or he selected a particular framework and show her/his understanding to it. A presentation is also required to present each student's final project at the end of the term. Presentations are to be 15-20 minutes in duration.

### Project Marking Scheme

Mark(%)	Comments
0	submitted late, or not at all
20	embarrassing
40	little effort obvious; incomplete implementation or no testing obvious
60	less than <b>original</b> offering suggesting a rework of course exercises; poor statement of context;
80	less original, and more modest offering, but sophisticated; statement of application context included;
100	clearly superior; obviously <b>original</b> transportation application; sophisticated; application context stated;

### Helpful Hints

- Try to use a real planning application
- Use maps, numbers and charts
- Do background research and reference it
- Do follow the format of formal report

Recommended format of the final report (including both position paper and term project):

1. Cover page
2. Table of contents
3. Abstract
4. Introduction
5. Literature review
6. Study data and method
7. Study results
8. Conclusions and Recommendations
9. Acknowledgement
10. References
11. Appendices (if any)

A hardcopy of the final report should be submitted to the instructor for marking before the deadline. In addition, an electronic copy of the final report, together with any supporting data and files (if any), should be submitted to the Blackboard before the deadline as well.

**Important Due Dates** (Note: The following schedules are tentative and the official due times will be listed under the “Assignment” section of the Blackboard):

Presentations	One or two weeks after they are assigned
Proposal	Three weeks after the class starts
Position paper and a brief presentation	Six weeks after the class starts
Final presentation	The last lecture
Term project report	The end of the semester

### List of Reading Papers

1. How land-use transportation models work
2. Design and Implementation of **PECAS**
3. Current Operational Urban Land-use–Transport Modelling Frameworks: A Review
4. **MUSSA**-land use model for Santiago City
5. A review of the **MEPLAN** from a perspective of urban economics
6. IRPUD Model-Overview
7. **TRANUS** - Integrated LUT modeling system
8. **UrbanSim**-Modeling Urban Development for Land Use, Transportation, and Environmental Planning
9. Congestion, land use, and job dispersion- A general equilibrium model
10. Micro-simulating urban systems
11. Cities as Complex Systems

Last edited on 11 November 2016