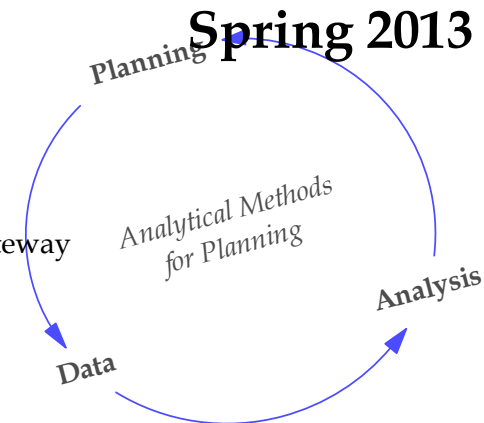


# PP&D 215: Analytical Methods *for* Planning

**Class Hours:** Tue & Thu 15:30~16:50

**Classroom:** 0240 Social & Behavioral Sciences Gateway

**Instructor:** Jae Hong Kim ([jaehk6@uci.edu](mailto:jaehk6@uci.edu))  
Mon 14:00~15:30  
or by appointment (206E SEI)



## COURSE DESCRIPTION

In order to successfully accomplish various missions of urban and regional planning, planners need to analyze the current state of their service areas and understand the dynamics of urban/regional systems. This course is designed to provide students with the core knowledge and advanced skills that are essential for a more complete analysis of a community or large metropolitan area. Emphasis is on the quantitative analytic methods useful for the purposes of a variety of planning practices. The course also discusses some fundamental theories of urban and regional changes, in addition to the methods and applications.

## COURSE OBJECTIVES

It is expected that every student

- will acquire the knowledge and skills in the following topics
  - 1) various quantification approaches
  - 2) matrix representation of interaction & transformation
  - 3) optimization & other equilibrium-based methodologies
  - 4) dynamic system modeling & simulation
- will enhance (quantitative) analytic capabilities required for a broad range of urban and regional planning tasks.

## COURSE ORGANIZATION & MATERIALS

Adopting a learning-by-doing approach, this course is organized as a series of lectures and computer lab sessions, followed by assignments. Each student will have a hands-on experience on a broad range of analytic methods. In addition, adequate time and opportunity for discussion will be provided. Therefore, students are responsible for

completing the assigned work on time and coming to class prepared to participate in discussions.

The lecture and lab materials, prepared by the instructor, will be extensively used throughout the entire course. In addition, students are encouraged to digest the assigned readings to fully achieve the course objectives, although the course is focused on exercising rather than reading. All materials are available via the course website (<https://eee.uci.edu/13s/54330>).

## GRADING

Grading will be based on the following elements:

- Assignments ..... 60%
  - 1) Measurement & Quantification
  - 2) Analysis of Spatial Distribution & Interaction
  - 3) Spatial Optimization
  - 4) Simple Dynamic System Modeling & Simulation
- Planning Method Review Report / Presentation ..... 30%
- Participation ..... 10%

## ACADEMIC HONESTY

As a responsible member of the academic community, every student should know and comply with all responsibilities, as found in the UCI general catalogue at <http://www.editor.uci.edu/catalogue/appx/appx.2.htm#academic>. Violations of academic honesty in any class activities will be strictly handled in accordance with the university policies.

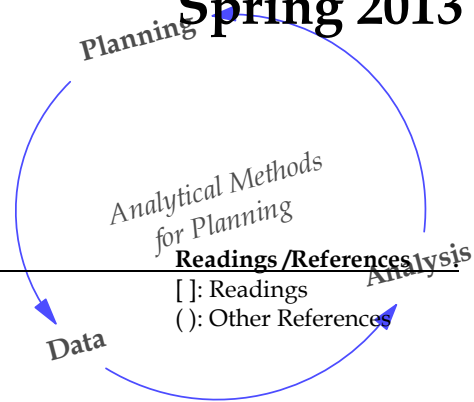
## SPECIAL CIRCUMSTANCES

Please communicate any expected or unexpected absences with the instructor as early as possible. Every effort will be made to work with students having unexpected obligations outside the course, such as family emergencies and health issues. Any student with a disability who needs special accommodation within and beyond the classroom also should contact the instructor and the UCI Disability Services Center (949-824-7494, <http://www.disability.uci.edu/index.php>) to get appropriate assistance so as to achieve the learning objectives in this course.

# PP&D 215: Analytical Methods *for* Planning

Spring 2013

## COURSE OUTLINE: TOPICS & READINGS \*



No.	Date	Topics	Readings/References
-----	------	--------	---------------------

[ ]: Readings  
( ): Other References

### Part I. Static Description & Representation

01	Apr 02	[Tu]	Course Intro	
02	Apr 04	[Th]	Concepts & Measurements	
03	Apr 09	[Tu]	Quantification Strategies	(A~B)
04	Apr 11	[Th]	Spatial Distribution - How to Measure/Understand?	[1]   (C)
05	Apr 16	[Tu]	Spatial Autocorrelation & Cluster	(D~E)
06	Apr 18	[Th]	Raster Analysis & Map Comparison	[2]   (F)
07	Apr 23	[Tu]	Spatial Interactions	(G)
08	Apr 25	[Th]	Matrix Representation of Interactions	

### Part II. Analysis of Dynamic System Behaviors

09	Apr 30	[Tu]	Matrix Representation of Transformation	[3]   (H)
10	May 02	[Th]	Structural Changes & Decomposition	(I)
11	May 07	[Tu]	Equilibrium & Optimization	
12	May 09	[Th]	Optimization in MS-Excel	[4]
13	May 14	[Tu]	Optimization in GAMS	(J)
14	May 16	[Th]	Disequilibrium Adjustment	(K~L)
15	May 21	[Tu]	Modeling - Basics & Principles	[5]
16	May 23	[Th]	Dynamic Sys. Modeling & Simulation	(M)

### Part III. Extensions & Applications

17	May 28	[Tu]	Scientific Planning	[6]
18	May 30	[Th]	Emerging Methodologies	[7~8]   (N)
19	Jun 04	[Tu]	Student Presentation	
20	Jun 06	[Th]	Student Presentation (Cont.) + Course Wrap-up	

\* Please be advised that the course schedule is subject to change.

**READINGS & OTHER REFERENCES**

1. Tsai, Y. H. 2005. Quantifying urban form: Compactness versus 'sprawl'. *Urban Studies* 42: 141-161.
  2. Kuhnert, M., A. Voinov, and R. Seppelt. 2005. Comparing raster map comparison algorithms for spatial modeling and analysis. *Photogrammetric engineering and remote sensing* 71: 975-984.
  3. Bourne, L. S. 1971. Physical adjustment processes and land use succession: a conceptual review and central city example. *Economic Geography* 47: 1-15.
  4. Ottensmann, J. R. 2000. Applications of spreadsheet optimization capabilities in teaching planning methods: Facility location and spatial interaction. *Journal of Planning Education and Research* 20: 247-258.
  5. Pidd, M. 1999. Just modeling through: A rough guide to modeling. *Interfaces* 29: 118-132.
  6. Batty, M. 1994. A chronicle of scientific planning: The Anglo-American modeling experience. *Journal of the American Planning Association* 60: 7-16.
  7. Klosterman, R. and C. Pettit. 2005. An update on planning support systems. *Environment and Planning B* 32: 477-484.
  8. Feser, E. 2013. Isserman's impact: Quasi-experimental comparison group designs in regional research. *International Regional Science Review* 36: 69-80.
- A. Musterd, S. and R. Andersson. 2005. Housing mix, social mix, and social opportunities. *Urban Affairs Review* 40: 761-790.
- B. Dewhurst, J. H. L. and P. McCann. 2002. A comparison of measures of industrial specialization for travel-to-work areas in Great Britain, 1981-1997. *Regional Studies* 36: 541-551.
- C. McGarigal, K., S. A. Cushman, and E. Ene. 2012. FRAGSTATS v4: Spatial Pattern Analysis Program for Categorical and Continuous Maps. Computer software program produced by the authors at the University of Massachusetts, Amherst. available at <http://www.umass.edu/landeco/research/fragstats/documents/fragstats.help.4.pdf>
- D. Messner, S. F. et al. 1999. The spatial patterning of county homicide rates: An application of exploratory spatial data analysis. *Journal of Quantitative Criminology* 15: 423-450.
- E. Lu, Y. 2000. Spatial cluster analysis for point data: Location quotients verses kernel density. 2000 University Consortium of Geographic Information Science

- (UCGIS) Summer Assembly Graduate Paper. available at <http://dusk.geo.orst.edu/ucgis/web/oregon/papers/lu.htm>
- F. Foody, G. M. 2007. Map comparison in GIS. *Progress in Physical Geography* 31: 439-445.
- G. Christopher, E. 2002. The CTPP - Historical Perspective. available at <http://www.trbcensus.com/articles/ctpphistory.pdf>
- H. Jahan, S. 1986. The determination of stability and similarity of Markovian land use change processes: a theoretical and empirical analysis. *Socio-Economic Planning Sciences* 20: 243-251.
- I. Barff, R. A. and P. L. Knight III. 1988. Dynamic shift-share analysis. *Growth and Change* 19: 1-10.
- J. Rosenthal, R. E. 1998. A GAMS (General Algebraic Modeling System) Tutorial. available at <http://www.gams.com/dd/docs/gams/Tutorial.pdf>
- K. Carlino, G. A. and E. S. Mills. 1987. The determinants of county growth. *Journal of Regional Science* 27: 39-54.
- L. Carruthers, J. I. and A. C. Vias. 2005. Urban, Suburban, and Exurban Sprawl in the Rocky Mountain West: Evidence from Regional Adjustment Models. *Journal of Regional Science* 45: 21-48.
- M. Ford, A. 2009. *Modeling the Environment*. \*\*\* Chapters 1 and 2 (preview draft versions) \*\*\* available at <http://public.wsu.edu/~forda/Ch%201.pdf> and <http://public.wsu.edu/~forda/Ch%202.pdf>
- N. Frethey-Bentham, C. 2011. Pseudo panels as an alternative study design. *Australasian Marketing Journal* 19: 281-292.