

## **SOCIOLOGY 216: Advanced Methods of Demographic Analysis**

**Fall 2001:** MW 2:20-3:35p.m. Rm W9.331 (Sociology-Psychology Building, Room 331)

**Instructor:** Kenneth C. Land, Ph.D.  
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**Hours:** By appointment at any time.

### **SYLLABUS**

**Bulletin Description.** The life table and stationary population models. Method of estimation of life tables. Multiple-decrement and increment-decrement life tables. The stable population model. Model age schedules for mortality, nuptiality, fertility, and migration. Survival analysis and hazard regression models. The random walk life table model and its extensions. Applications of computer packages for demographic analysis.

**Prerequisite.** Sociology 215: Basic Methods of Demographic Analysis or equivalent.

**Course Materials.** We will use as reading materials a textbook in demographic analysis, a set of lecture notes, and selected journal articles:

- Preston Samuel H., Patrick Heuveline, and Michel Guillot. 2001. *Demography: Measuring and Modeling Population Processes*. New York: Blackwell Publishers.
- Land, Kenneth C. *Lecture Notes in Advanced Demographic Analysis*. Copies of weekly materials will be given to all students in the class.
- Selected journal articles to be assigned. Copies will be given as assigned to each student in the class.

**Organization of the Course.** The course primarily will follow a seminar format. During some class meetings, the instructor will review class reading materials, elaborate on various points, add side-notes, and answer questions. During other class meetings, the instructor will assign students to do similar work and/or report on computational exercises.

**Requirements and Grading.** As indicated, students will be expected to participate in classroom discussions and make presentations (later in the semester). Grades will be based on:

- class participation,
- class assignments, and
- a final examination covering the course content.

Class participation will involve the occasional summary and exposition of class readings. Class assignments involve the presentation of results from computational exercises.

**Course Schedule.** Topics covered in the course will proceed more or less according to the following schedule, although some deviations may occur.

**Weeks of:**

August 27, 28

- No class on August 27<sup>th</sup> (Doctoral Qualifying Exams conflict).
- Introduction to the course.

**Part I. Continuous-Time Mathematics and Population Dynamics Without Age.**

September 3, 5

- Review of Basic Calculus and Population Mathematics Without Age.

## **Part II. The Single-Decrement Life Table/Stationary Population Model in Continuous Time.**

September 10, 12

September 17, 19

- The Single-Decrement Life Table/Stationary Population Model in Continuous Time.
- Estimation of Unabridged Life Tables.
- Estimation of Abridged Life Tables.

## **Part III. Stable and Nonstable Population Models.**

October 1, 3

October 8, 10

- Population Projection and Classical Discrete-Time Single-Sex Stable Population Theory.
- Classical Continuous-Time Single-Sex Stable Population Theory.
- Demographic Relations in Nonstable Populations.

October 15, Fall Break

## **Part IV. Model Age Schedules, Multiple Decrement, and Increment-Decrement Models.**

October 17

October 22, 24

October 29, 31

- Modeling Age Patterns of Vital Events.
- Multiple Decrement Life Tables.
- Increment-Decrement (Multistate) Life Tables.

## **Part V. The Relationship of Population Life Table Models to Models of Survival Analysis in Statistics and Biostatistics.**

November 5, 7

November 12, 14

November 19, 21

November 26, 28

- No class on November 21<sup>st</sup>.
- The relationship of Demographic Life Table Models to Event History/Survival Analysis/Hazard Regression Models.
- The random walk life table model and its Extensions.

December 3, 5

- No classes. Graduate Reading Period.

December 10—15. Final Examinations.

