Introduction to Demographic Methods
SOC 533 - Winter 2017

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Lecture: Tue. 3:30-6:20pm
Loew Hal (LOW) 115
Office Hours: by appointment

In this course, we will study fundamental concepts, measures and models that demographers use to understand population dynamics. Demography as a discipline relies on a core methodological component that addresses problems related to i) measuring and estimating population rates; ii) developing models to expand our analytical thinking; iii) formalizing theories; iv) linking individual-level processes with macro-demographic trends; iv) producing forecasts that combine all the available information. The use of demographic methods is constantly changing, as new problems and priorities arise. Some examples of the work that demographers have developed include approaches to understand the determinants of population growth; to evaluate the consequences of changing age structure; to produce estimates of mortality and fertility rates using indirect techniques; to assess the impact of heterogeneity across individuals on population health and mortality; to produce population projections.

The main goal of the course is to familiarize students with tools and concepts that are widely used by demographers and that are essential in order to be able to understand the literature that uses demographic methods. There will be a mix of lectures and hands-on activities with various tools.

Prerequisites and Diversity of Student Backgrounds: Students in this class have different backgrounds and come from different departments. Some students may have strong quantitative skills, some others may not. Some students may be familiar with population studies, some others may not. To accommodate the range of backgrounds, I emphasize key methodological concepts and encourage the participation of students who do not have extensive background in methods, but are eager to learn.

The course assumes that students have some familiarity with handling data using a software of their choice (e.g., Excel, R, Stata, SAS). Some homework assignments and the final project will require data manipulation. R is among the most suitable programming languages for demographic data analysis. I will provide show some examples of tools for demographic research written in R. However, knowledge of R is not necessary to complete the course successfully. Some familiarity with other software, like Excel or Stata, is acceptable. For those who are interested in learning R, I would suggest attending R workshops on campus offered by CSDE, CSSCR or Software Carpentry.
I will assume fluency with high-school mathematics. For part of the material that we cover in this course, basic familiarity with calculus is useful to fully appreciate the derivations and techniques presented. However, it is not necessary: we would review the necessary concepts from calculus along the way.

**Textbook:** We will use the following book:


All the material assigned from this book is required. The textbook is available at the University Bookstore. I recommend that you purchase the book. Alternatively, you could download PDFs of single chapters of the book via JSTOR, though your UW library connection, using the following link: [http://www.jstor.org/stable/j.ctt6wps5v](http://www.jstor.org/stable/j.ctt6wps5v)

**Course Requirements and Grading**

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<thead>
<tr>
<th>Participation &amp; Contribution</th>
<th>10%</th>
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<tr>
<td>Homework Assignments</td>
<td>45%</td>
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<tr>
<td>Term Project</td>
<td>15%</td>
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<td>Final Exam</td>
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**Class Participation:** Class participation will count towards your final grade. Please help create a constructive learning environment. Different people have different ways in which they participate best, all of which are valid: thoughtful preparation, sharing a well-formulated idea after a long pause, stimulating discussion through questions, helping a classmate understand a concept, discussing ideas and challenges during office hours, sharing news articles with the class via canvas, etc. I strongly encourage you to interact with me and the other students. Please listen to your peers, wait for your turn to speak, and refrain from using discriminatory language. If you are very talkative, make sure that your quieter peers get a chance to speak. If you are shy, remember that if you have a question, most likely there is at least one other person with the same question who would be happy to listen to the answer.

**Homework assignments:** There will be homework assignments almost every week. Most of the assignments will be problem sets where you will be asked to answer questions, like the ones at the end of the book chapters. These are typically "paper and pencil" type of problems, that you would be able to address with the help of a hand calculator. Some assignments may include questions where you will be asked to automate demographic methods discussed in class using a software or programming language of choice. You may work in small groups (2-3 people) on the assignments, but each person of the group must submit a copy of the assignment and report the names of all the group participants.
Term Project: You will be asked to develop a small project for this class. For the project, you will be asked to select a demographic method of your choice (either a method discussed in class or a method that is not covered in the course, but that interests you), and develop a tool to implement it with real data. For example, you may develop a spreadsheet or some R code that takes demographic rates as input and produces a matrix for population projection as output; or you could generate a tool to produce estimates of some demographic quantities from some survey data; or you could develop a tool to estimate parameters for a demographic model, etc.

You may work in small groups (2-3 people) for the term project, or you can choose to work individually. Please discuss with me your choice of topic. On the last day of the course you will be asked to present a brief demo of your tool.

Final exam: The final exam is an opportunity to consolidate the skills that you have learned during the course. It will cover the material presented in class and will consist of questions similar in style to the ones asked for the homework assignments. Appendix B of the textbook contains “useful formulas”. A printout of those formulas will be made available during the exam as a “cheat sheet”. You will need to have a simple handheld calculator for the exam. I would recommend that you use the same calculator for homework assignments. No cellphones or laptops will be allowed during the exam.

Class Conduct

The class atmosphere will be quite relaxed. Here are just a few guidelines:

- Arriving a bit late is tolerated as long as you make an effort to minimize the disturbance for other students.

- Eating and drinking in class is allowed, but please make sure that you are not disturbing others.

- Please turn off your cellphone or put it on silent mode.

- If you cannot make it to class for whatever reason, make sure that you know what happened during the lecture or lab that you missed.

- If you are having trouble with the course material or personal problems that are hindering your performance in the class, please come and talk to me so that we can solve the problem before it is too late. It is better to bring up any concerns as early as they arise.

- Please always show respect to your fellow classmates and help create a positive and constructive environment
**Students with Disabilities**
Please inform me as soon as possible of special needs that you may have. The sooner you notify me, the better I will be able to make appropriate arrangements.

**Academic Integrity**
A fundamental tenet of all educational institutions is academic honesty. Students must do all their work within the boundaries of acceptable academic norms. See the UW statement about student academic responsibility prepared by Committee on Academic Conduct in the College of Arts and Sciences (https://depts.washington.edu/grading/pdf/AcademicResponsibility.pdf). Students found guilty of plagiarism or academic dishonesty will be subject to appropriate disciplinary actions.

**Approximate Course Schedule**

Week 1 **Tue, Jan 3rd** – Introductions; models of population growth; periods and cohorts
   Reference: Chapters 1 and 2 of Wachter (2014)

Week 2 **Tue, Jan 10th** – Cohort mortality and life tables
   Reference: Chapters 2 and 3 of Wachter (2014)

Week 3 **Tue, Jan 17th** – Cohort fertility
   Reference: Chapter 4 of Wachter (2014)

Week 4 **Tue, Jan 24th** – Population Projections
   Reference: Chapter 5 of Wachter (2014)

Week 5 **Tue, Jan 31st** – Period Fertility
   Reference: Chapter 6 of Wachter (2014)

Week 6 **Tue, Feb 7th**: Introduction to version control with git and github
   TBA
Week 7  **Tue, Feb 14th – Period Mortality**

Reference: Chapter 7 of Wachter (2014)

Week 8  **Tue, Feb 21st: Stable Age Structures**

Reference: Chapter 10 of Wachter (2014)

Week 9  **Tue, Feb 28th: Heterogeneous risks**

Reference: Chapter 8 of Wachter (2014)

Week 10  **Tue, Mar 7th: Student Presentations, Marriage and the Family, Conclusions**

Reference: Chapter 9 of Wachter (2014) + handouts

**Final exam:** Thursday, March 16, 2017, 430-620 pm, LOW 115