

MSc/Diploma in Official Statistics  
Professional Development Programme  
MSc/Diploma in Demography  
MSc/Diploma in Social Statistics

## **DEMO6022 Demographic Methods 2**

**Programme and course outline**

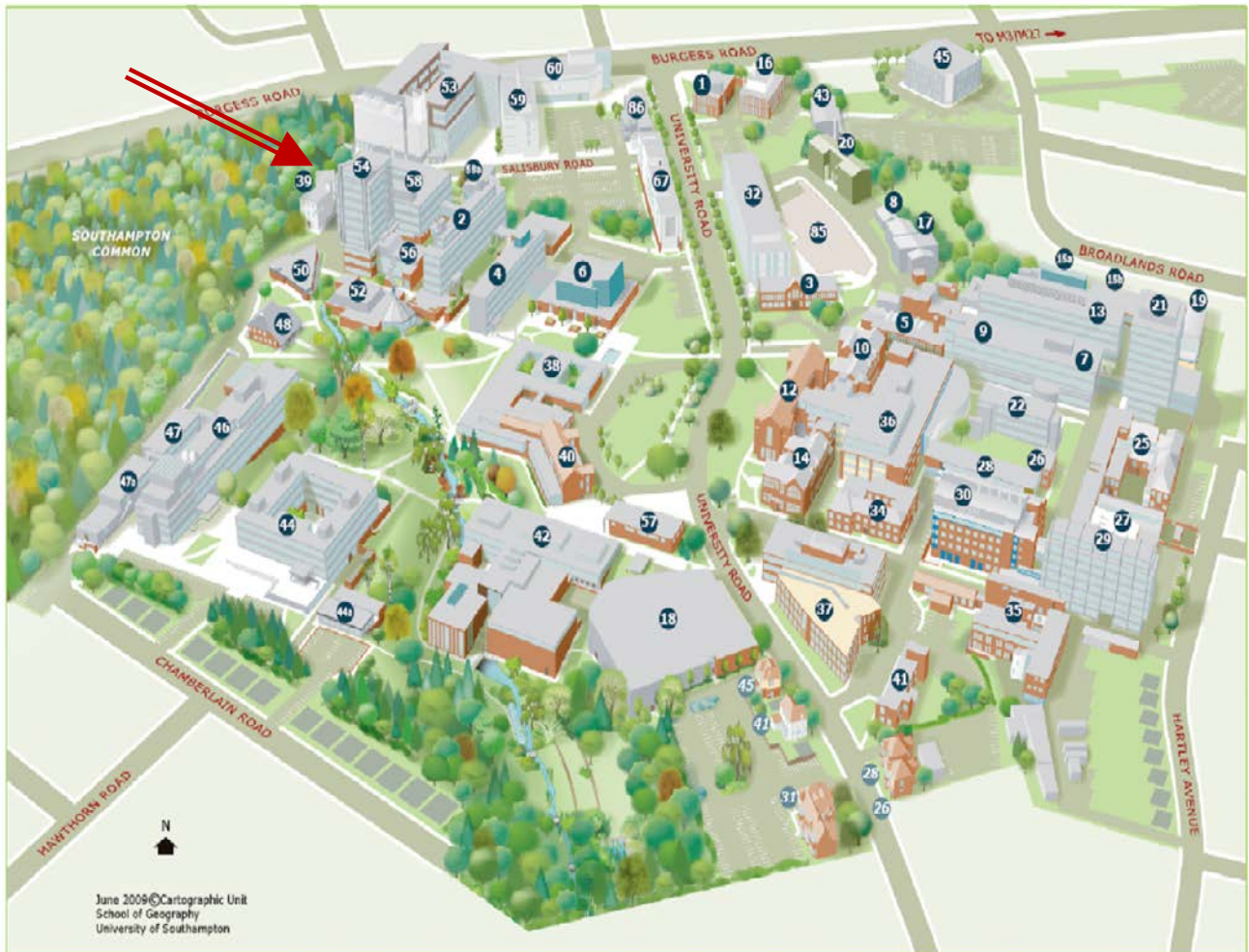
**7–11 March 2016**

**Seminar Room  
Social Statistics Research Centre (Building 39)  
University of Southampton  
Highfield, Southampton, SO17 1BJ**

Campus map:

[http://www.southampton.ac.uk/visitus/campuses/maps/highfield\\_3d\\_key.pdf](http://www.southampton.ac.uk/visitus/campuses/maps/highfield_3d_key.pdf)

Building 39 is in the north-west corner of the Highfield campus, across the side road from the Murray Building (Building 58)



# PROGRAMME

## Monday, 7 March 2016

<i>From 9:30</i>	<i>Registration – MOffStat office, Room 2037, Murray Building – 58</i>
10:00	<b>L1:</b> Introduction to the Course and Refresher Session. <i>Group Exercise on Ethnic Group Fertility in the UK</i>
<b>11:00</b>	<b>Coffee/tea break</b>
11:15	<b>L2:</b> Multiple decrement life tables and other advanced life table methods.
12:15	<i>Class Exercise 1: Dependent multiple decrement life table.</i>
<b>1:00</b>	<b>Lunch break</b>
2:00	<b>L3:</b> Multiple decrement life tables and health expectancies.
<b>3:30</b>	<b>Coffee/tea break</b>
3:45	<i>Class Exercise 2: Independent multiple decrement life tables and health expectancies.</i>
<b>5:00</b>	<b>Close</b>

## Tuesday, 8 March 2016

10:00	<b>L4:</b> Event history analysis and birth histories.
<b>11:00</b>	<b>Coffee/tea</b>
11:15	<b>L5:</b> Additional fertility measures: parity progression and birth history measures.
12:15	<i>Class Exercise 3: Handling event history data.</i>
<b>1:00</b>	<b>Lunch break</b>
2:00	<i>Class Exercise 4: Parity Progression ratios.</i>
<b>3:30</b>	<b>Coffee/tea break</b>
3:45	<i>Class Exercise 5: Birth interval analysis.</i>
<b>5:00</b>	<b>Close</b>

## Wednesday, 9 March 2016

10:00	<b>L6:</b> Fertility and reproduction estimated from cross-sectional or longitudinal surveys.
<b>11:00</b>	<b>Coffee/tea</b>
11:15	<b>L7:</b> Model age patterns and stable population theory. Applications: historical data and populations lacking complete vital statistics.
12:15	<i>Class Exercise 6: Stable population calculation.</i>
<b>1:00</b>	<b>Lunch break</b>
2:00	<b>L8:</b> Models for measuring fertility changes.
2:45	<i>Class Exercise 7: constructing a stable age distribution.</i>
<b>3:30</b>	<b>Coffee/tea</b>
3:45	<i>Class Exercise 8: Estimation of net migration using stable population models and empirical data.</i>
<b>5:00</b>	<b>Close</b>

## Thursday, 10 March 2016

10:00	<b>L9:</b> Models for demographic estimation when data are incomplete or inaccurate.
<b>11:00</b>	<b>Coffee/tea</b>
11:15	<b>L10:</b> Projections revisited. Small area and household projections
12:15	<i>Class Exercise 9: Logit models for life tables and fertility schedules.</i>
<b>1:00</b>	<b>Lunch break</b>
2:00	<b>L11:</b> Matrix population models. The Leslie matrix. Introduction to multistate demography.
<b>3:30</b>	<b>Coffee/tea</b>
3:45	<i>Class Exercise 10: Matrix population modelling</i>
<b>5:00</b>	<b>Close</b>

## Friday, 11 March 2016

10:00	<b>L 12:</b> Demographic uncertainty and probabilistic population forecasting
<b>11:00</b>	<b>Coffee/tea</b>
11:15	<i>Class Exercise 11: Using PAS Spreadsheets and UNFPA/IUSSP 'Tools for Demographic Estimation' and MORTPAK for cohort component projection.</i>
12:15	Summary and review of topics covered
<b>1:00</b>	<b>Lunch break and close</b>

**There will be optional face-to-face revision sessions in May 2016, before the final examination – exact dates *tbc*, but they will be held on a date convenient to as many people as possible.**

Note: The times in *italics* are approximate.

### CONDUCT OF THE COURSE

The slides for each lecture will be provided in printed booklets distributed at the outset. Additional explanatory slides and other teaching materials will be added to the course website. For the class exercises, students may work in small groups. Calculators will be provided for MOffStat students, but all students are welcome to use their own laptop computers if available. Some public-domain software for demographic analysis will be distributed to all students. Some key readings will be posted on the website and students are expected to have read the required papers before the class.

**LECTURER**

Dr Jakub Bijak is the course coordinator and will be available for consultation throughout the course (7–11 March 2016). The course has been originally developed by Professor Máire Ní Bhrolcháin, and re-designed by Professor Allan G Hill, whose respective contributions to the development of the syllabus, the lectures and the exercises are gratefully acknowledged.

Office Room 4025, Murray Building – 58  
Office hours Please email for an appointment  
Email [j.bijak@soton.ac.uk](mailto:j.bijak@soton.ac.uk)  
Phone 023 8059 7486

The Teaching Assistant is Mr Ben Pedley, email: [B.D.Pedley@soton.ac.uk](mailto:B.D.Pedley@soton.ac.uk).

**PRE-REQUISITE**

DEMO 6020 / DEMO 6028 Demographic Methods 1, or an equivalent course

**AIMS AND OBJECTIVES**

To introduce students to more advanced demographic methods and to illustrate their application to official statistical purposes and related demographic questions.

**LEARNING OUTCOMES**

On successful completion of this course, you will:

- (a) Understand the concepts underlying stable population theory and ways in which birth rates, death rates and migration affect the age composition of a population;
- (b) Be familiar with models of fertility and mortality and how these are used for forecasting and demographic estimation.
- (c) Be clear about more complex applications of the life table –multiple decrement and increment-decrement applications.
- (d) Understand the major approaches to the estimation of fertility and reproduction using parity-specific fertility measures and related statistics;
- (e) Understand the principles and potential biases involved in analysing event history data.

**KEY SKILLS**

- (a) Be able to construct a multiple decrement life table, and to re-calculate a life table with one cause of death deleted;
- (b) To calculate parity progression ratios, measures of marriage change and other measures using event histories;
- (c) To use models of fertility and mortality to produce estimates of future levels and trends.
- (d) Problem solving. Using spreadsheets and open access demographic software for a range of demographic tasks.

**CALCULATORS**

Calculators will be provided for MOffStat students: you will be asked to sign on receipt and to return the calculator to the MOffStat Administrator (Room 2037, Murray Building – 58, e-mail: [moffstat@socsci.soton.ac.uk](mailto:moffstat@socsci.soton.ac.uk)) before you leave Southampton.

All other students: please bring a calculator with you.

## **TEACHING AND LEARNING METHODS**

The course will be taught by lectures and extended small-group practical classes. Paper copies of the lecture slides and class exercises will be handed out at the beginning of the course. Some indicative reading is given at the end of this outline, and further sources will be mentioned in lectures.

## **BLACKBOARD SITE**

When registered for the unit, you should be enrolled automatically on the Unit's Blackboard course and you can log on at: **15-16 – Demographic Methods 2 – 25620**. If you do not have access to the site please let us know so that we can enrol you.

## **ASSESSMENT METHODS**

The course will be assessed in **100% by a 2-hour examination** in May/June 2016. The paper will have three sections: Section A with one compulsory question, worth 33% of the total marks, Section B, where you may choose one of two questions, worth 33% of the marks, and Section C with one compulsory question, worth 34% of the marks. In exam papers prior to 2010–11, the structure differed slightly, but the style of the questions remains similar.

## **RESIT ARRANGEMENTS**

In the unfortunate event of failing the module, the resit will be in 100% by two-hour supplementary examination, to be held in August/September 2016.

## **FEEDBACK TO STUDENTS**

'Feedback' refers to any instance in which you receive information about how well you understand the material, how successfully you are progressing in the module, or how to improve your performance. Feedback is continuous and does not refer merely to comments on your assessed work (but certainly includes that). Other instances in which you receive feedback include: seminar discussions, question time during lectures, interaction with others in any online discussion forum, replies to email questions you send me, discussions with me during my office hours – please email me if you need an appointment.

In particular, within DEMO6022 you will receive interim and informal ('formative') feedback in the lectures, exercises and workshops, including the optional revision sessions in May.

Feedback on exam performance is, in the first instance, available online the day module marks are released. This feedback provides important information on common strengths and weaknesses in exam performance for all those who sat the exam. It gives a marks distribution, so you know how you performed relative to others and should give you some understanding of what was expected in order to achieve a high mark. You may also ask to have individual feedback, in person, either with the module co-ordinator or the exam marker. To make this request, speak to someone at Reception at the Student Office, where you can collect a request form.

## **ACADEMIC INTEGRITY**

The University places the highest importance on the maintenance of academic integrity in the conduct of its affairs, and the Regulations Governing Academic Integrity can be found in the University Calendar available online at <http://www.calendar.soton.ac.uk/sectionIV/academic-integrity-regs.html>. Please familiarise yourself with what is expected of you.

Your attention is drawn particularly to the Quality Handbook Academic Integrity page, [http://www.southampton.ac.uk/quality/assessment/academic\\_integrity.page?](http://www.southampton.ac.uk/quality/assessment/academic_integrity.page?), which contains Academic Integrity Guidance for Students, outlining those things which you must seek to avoid, including cheating and plagiarism. A very useful set of guides is available at <http://www.studyskills.soton.ac.uk>. These aim to help you gain a better understanding of academic integrity and develop your skills so that your assessed work does not accidentally plagiarise the work of others.

If academic integrity is deemed to have been breached, there are a range of penalties that may be applied. If you are unsure about what is and is not permitted, ask – we will be happy to explain and discuss.

#### **TROUBLESHOOTING**

If you have any difficulties during the course, please approach the course co-ordinator who will be happy to help you, if he can. If this does not resolve the problem, you could discuss the issue with the respective programme co-ordinator: Dr Jennifer Holland for both MSc Demography and MSc Social Statistics ([J.A.Holland@soton.ac.uk](mailto:J.A.Holland@soton.ac.uk)), and Dr Paul Smith for MOffStat ([P.A.Smith@soton.ac.uk](mailto:P.A.Smith@soton.ac.uk)). If that fails, then please discuss the matter with the Head of Teaching Programmes in the Department of Social Statistics and Demography (Dr David Holmes, [djh@soton.ac.uk](mailto:djh@soton.ac.uk)).

If you have a major difficulty during the course, such as a health problem that prevents you from attending lectures, or seriously interferes with your work, you should make sure to obtain documentation of the difficulty—e.g. a medical certificate. You should then fill in a Special Considerations form and bring it with any documentation to your personal academic tutor for signature, and eventually to School Office for filing. The difficulty can then be taken into account when the final examination board meets.

#### **READING**

##### ***General demographic methods***

*Selected sections of each of these texts will be useful to you—you would not be expected to work through all of them, or even any one of them, from start to finish. Further reading will be given for each topic area. Note that the course collection items are located under different course codes – typically DEMO6020 or DEMO6028.*

Useful refresher texts:

Newell, C. (1988) *Methods and Models in Demography*. London: Belhaven.

**HB 881 NEW; Course collection DEMO6020**

*Good, introductory text, with exercises and answers. Strong on model life tables and fertility measures. From £8.50 or so used on amazon.co.uk*

Hinde, A. (1998) *Demographic methods*. Arnold, London (with Internet site for exercises).

**12 copies in Library: HB 881 HIN; Course collection DEMO6028**

The best single text which is worth purchasing if intending to go further is:

Preston, S.H., Heuveline, P. and Guillot, M. (2001) *Demography: Measuring and Modelling Population Processes*. Oxford: Blackwell. **HB 849.4 PRE; Course collection DEMO6028**  
*Excellent text; more advanced than those above; paperback from £18 used on amazon.co.uk*

***Some other texts, arranged from easy to more difficult:***

Palmore, J.A. and R.W. Gardner (1994) *Measuring mortality, fertility and natural increase*. East-West Center, Honolulu. **HB 849.4 PAL; Course collection DEMO6028**

Weeks, J.R. (2004) *Population: An Introduction to Concepts and Issues*. Wadsworth Publishing Company: New York. Ninth Edition. **HB 871 WEE; Course collection DEMO6028**

Siegel, J.S. and D.A. Swanson (eds.) (2004) *The Methods and materials of demography*. 2nd edition. San Diego, CA: Elsevier Academic Press. **HB 881 SIE; Library online resource**

Siegel, J.S. (2002) *Applied Demography: Applications to business, government, law and public policy*. London: Academic Press. **HB 849.4 SIE; Course collection DEMO6028**  
*Excellent on applied aspects, though with American focus and examples. See selected sections of Chapters 1, 3 and 4 on measurement, life tables and data sources, Chapter 9 on population estimates, and Chapter 10 on projections.*

Pollard, A.H., Yusuf, F., and Pollard, G.N. (1990) *Demographic Techniques*. 3rd edition. Oxford: Pergamon Press. **HB 881 POL**  
*A very straightforward and useful text, though not comprehensive.*

Rowland, D. (2003) *Demographic methods and Concepts*. Oxford: OUP.  
*A good recent general text on methods.* **HB 849.4 ROW; Course collection DEMO6028**

Poston, D. and L. Bouvier (2010) *Population and society: an introduction to demography*. Oxford. **HB 849.4 POS**  
*Excellent text, more advanced than others in this list.*

Rowland, D. (2003) *Demographic Methods and Concepts*. Oxford: OUP  
*A good recent general text on methods* **HB849.4 ROW; Course collection DEMO6020**

Smith, D. P. (1992) *Formal Demography*. New York: Plenum. **HB 881 SMI**

Wachter, K. (2014) *Essential Demographic Methods*. Harvard University Press.  
**HB 849.4 WAC; Library online resource; Course collection DEMO6020**

**Handling event histories**

Ní Bhrolcháin, M. (1993) Describing time-trends in fertility using maternity history information. Chapter 3 in M. Ní Bhrolcháin (ed) *New Perspectives on Fertility in Britain*. London: HMSO, pp. 33-50. **HB 891 NIB**



## Further demographic measurement

Ní Bhrolcháin, M. (2001) Demographic measurement: general issues and measures of fertility. *International Encyclopaedia of the Social and Behavioural Sciences*, Elsevier.

**Library online resource; Course collection DEMO6020**

Ní Bhrolcháin, M. (2001) Demographic measurement: nuptiality, mortality, migration, and growth. *International Encyclopaedia of the Social and Behavioural Sciences*, Elsevier.

**Library online resource; Course collection DEMO6020**

\* Ní Bhrolcháin, M. (2011) Tempo and the TFR. *Demography*, 48: 841–861. (optional)

<http://link.springer.com/article/10.1007%2Fs13524-011-0033-4>

## Population projections

Office for National Statistics (2011) National Population Projections, 2014-Based.

<https://www.gov.uk/government/statistics/national-population-projections-2014-based-projections>

Keilman, N. (2007) National population projections in perspective: How successful compared to those in other European countries? *Population Trends*, 129: 20–30.

<http://www.ons.gov.uk/ons/rel/population-trends-rd/population-trends/no--129--autumn-2007/uk-national-population-projections-in-perspective--how-successful-compared-to-those-in-other-european-countries-.pdf>

Keilman, N. (2008) European demographic forecasts have not become more accurate over the past 25 years. *Population and Development Review*, 34: 137-153.

<http://folk.uio.no/keilman/pdr3.pdf>

### Can't find a book in the Library...

**The book I want is on loan to someone else.** Use WebCat to place a hold on the book even if you think it won't be returned in time (this will notify staff that the book is in demand). If you think more copies of a text may be required, please also tell your course tutor.

**WebCat says it's on the shelf but it's not.** Start by asking at the Enquiry Desk. If Library staff can't find the book, look again the next day. If you still can't find it, go back to the Enquiry Desk and say that you would like to report the book missing. Library staff will then search again and let you know the outcome.

**Other problems using the Library...** please ask at the Enquiry Desk for help or contact your Subject Librarian, Ms Harry Gibbs – [T.A.Gibbs@soton.ac.uk](mailto:T.A.Gibbs@soton.ac.uk)

Jakub Bijak  
11 February 2016