

Appendix A

Assignments

Welcome to BS4/OBS4 Actuarial Science. There is a website for the course at

<http://www.stats.ox.ac.uk/~winkel/bs4a.html>

where lecture notes, assignment sheets and solutions will be made available as the course progresses.

Classes for UNDERGRADUATES are in five or six groups of about eight to twelve students, we will run six sessions of 60 minutes each in weeks 3-8 this term. The Department of Statistics has NOT adopted the structure of 4x1.5 hour classes of the Mathematical Institute. Please hand in scripts into the appropriate drawer at the Department of Statistics, 1 South Parks Road. The drawers will be labelled by your class time, so you will need to know when your class is. Please also mark your work by your class time. Times and rooms for the classes are as follows:

- Wednesdays 9.30-10.30am, Room 104, Department of Statistics, weekly, weeks 3-8
- Wednesdays 10.30-11.30am, Room 104, Department of Statistics, weekly, weeks 3-8
- Wednesdays 2-3pm, 2 South Parks Road Seminar Room, Department of Statistics, weekly, weeks 3-8
- Wednesdays 3-4pm, 2 South Parks Road Seminar Room, Department of Statistics, weekly, weeks 3-8
- Fridays 3.15-4.15pm, Room 104, Department of Statistics, weekly, weeks 3-8
- Fridays 4.15-5.15pm, Room 104, Department of Statistics, weekly, weeks 3-8

Class distribution FOR UNDERGRADUATES will be made straight after the first lecture and the result made available on the Minerva database of the Statistics Department, which you can find at

<https://minerva.stats.ox.ac.uk/perl/classlists.pl>

GRADUATE STUDENTS on the MSc in Applied Statistics CANNOT participate in the intercollegiate class scheme. Separate and less frequent classes will be offered. Also, the material on applications covered around weeks 4-5 this term is *not* examinable for MSc students in Applied Statistics.

This course is such that the main ideas are introduced at the very beginning: cash-flow model, interest, time value of money and equations of value. Furthermore, this is not a purely mathematical course, although some of the interest rate theory has a theoretical

flavour. You need to develop some non-mathematical skills, which some of you will find easy, others not necessarily so. It is essential that you understand the main ideas of the first four lectures or so (at least for constant interest rates), before you can appreciate that most of the remainder is to a large extent application of these to a wide range of settings, each with their own terminology and notation.

You are advised to improve your understanding of the subject taking into consideration the following references. It is intended that lectures cover all the material required for the exam, but reading the same with other words or further developments often leads to more efficient learning.

All publications below are available from the

Publications Unit
Institute of Actuaries
4 Worcester Street
Oxford OX1 2AW.

between Worcester College and Gloucester Green.

Institute & Faculty of Actuaries: CT1 (102) Financial Mathematics 2011

This is the Core Reading for the Professional Examination corresponding to BS4/OBS4. Most of the BS4a/OBS4a material can be found here. In some places, the presentation here is more practically oriented than the lectures. The Actuarial Profession has published the Core Reading for many years with only very minor updates, so an earlier edition is just as good a reference as a more recent edition.

McCutcheon and Scott: An Introduction to the Mathematics of Finance 1986

This is *the* book on the subject. The Core Reading above is still largely based on this book. Although the book is getting old, while the Core Reading is kept up to date, I recommend it as it is a more detailed account of this unit. Also, the presentation is more mathematical. There are many exercises with solutions. This book is also available from the Institute of Actuaries.

Zima and Brown: Mathematics of Finance 1993

This book has been written for Canadian (and US) actuarial students. The approach is very elementary with many worked-out examples, practical methods and exercises, but possibly the right source to find clarification in some fundamental points of the course.

Bowers et al.: Actuarial mathematics 1997

This compendium takes a different approach and addresses much more, for instance utility and risk theory, models for pensions and general insurance. I recommend this only for further reading beyond the scope of this unit, since I find it difficult to extract those parts relevant for us.

Danthine and Donaldson: Intermediate Financial Theory 2005

This is a book written for Finance students, which is useful for us only as further reading, to learn more about how financial markets work. There is a much more extensive treatment of arbitrage-free pricing and other theories of value, some of which are treated in BS4b/OBS4b.