

BEPP 454/STAT 454. BEPP 854/STAT 854
Applied Statistical Methods for Actuaries
Spring 2015

This course has been approved by the Society of Actuaries for VEE Times Series credit. A grade of B- or better on the course (not on the Time Series exam) satisfies the requirement.

Part I: Time Series Models

Instructor: Paul Shaman
457 JMHH
shaman@wharton.upenn.edu, 215-898-8749

Office hours: Monday, Tuesday, and Thursday, 4:30-6

Class meets: TTh 12–1:20

Website

I am using Canvas. You can gain access by going to canvas.upenn.edu. All notes, homework assignments and data sets will be distributed and managed via the website.

Course Materials

Class notes will be posted throughout the quarter on Canvas. These will constitute the course teaching material.

Software

JMP 11 statistical software. If you don't already have this software, I *highly recommend* you buy it so that you have it on your own computer. We will use it extensively in class, and you will need to know how to read its output and use it for assignments and for reading class notes. When you install the software on your computer you will also have installed seven manuals and two cards for quick reference, all in pdf format.

A three-year JMP 11 license may be purchased for \$59.95 at upenn.onthehub.com. Shorter term licenses are available from estore.e-academy.com. A six-month license costs \$29.95 and a twelve-month license sells for \$49.95. If you have a working earlier version of JMP, it will be sufficient.

Homework

There will be three homework assignments.

Lesson 1	Overview and introduction to JMP
Jan 15	
Lesson 2	Review of simple regression
Jan 20	
Lesson 3	Review of multiple regression
Jan 22	
Lesson 4	Trends and seasonality
Jan 27	
Lesson 5	Trends and seasonality
Jan 29	
Lesson 6	Trends and seasonality
Feb 3	
Lesson 7	ARMA models
Feb 5	
Lesson 8	ARMA models
Feb 10	
Lesson 9	ARIMA models
Feb 12	
Lesson 10	ARIMA models
Feb 17	
Lesson 11	Forecasting with ARIMA models
Feb 19	
Lesson 12	ARCH and GARCH models
Feb 24	
Lesson 13	Review of Part I
Feb 26	
Lesson 14	Midterm Exam (open notes, calculator)
Mar 3	

Grade Part I: 40% assignments, 60% midterm exam.

Part II: Coverage Modifications and Simulation

Instructor: Jean Lemaire

Textbook: Klugman, Panjer, Willmot: Loss Models. From Data to Decisions, 2nd ed., 3rd ed., or 4th ed.

Course pack www.study.net. Answers to course pack exam questions can be found in www.soa.org (click on Education, Exams and Requirements, ASA, Exam C, Past Exam questions and solutions).

Office hours: Tuesdays, Thursdays 3:00-5:00. JMHH 459

Coverage Modifications

Lesson 15 Mar 5	Reinsurance	Course pack
Lesson 16 Mar 17	Deductibles	K 8.2, K 3.1
Lesson 17 Mar 19	Deductibles	K 8.2
Lesson 18 Mar 24	Deductibles	K 8.2
Lesson 19 Mar 26	The Loss Elimination Ratio. Inflation	K 8.3
Lesson 20 Mar 31	Policy limits. Coinsurance	K 8.4, K 8.5
Lesson 21 Apr 2	Past exam questions	Course pack

Simulation

Lesson 22 Apr 7	The inversion method - continuous	K 21.1
Lesson 23 Apr 9	The inversion method - discrete	Course pack
Lesson 24 Apr 14	Number of simulations	K 21.1
Lesson 25 Apr 16	Actuarial applications	K 21.2
Lesson 26 Apr 21	Past exam questions	Course pack
Lesson 27 Apr 23	Open	
Lesson 28 Apr 28	Mid-term exam. You may have in class your class notes and a calculator.	

Final course grade: Average of part I and part II scores