

Statistics 3540: Time Series I
Section 01: Winter 2008
Slot 3: MWF 10:00–10:50am HH–3013

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Office Hours: Mondays noon–2pm, Wednesdays 1:00–3:00pm, Thursdays 11:00–noon or by appointment.

Textbook: *Forecasting, Time Series and Regression*, 4th edition, by Bowerman, O’Connell and Koehler. I will put a copy of an older version of this text (it has a slightly different title) on reserve in the library.

Additional Reference: Some lecture notes, written by Dr. Alwell Oyet, are available via the course webpage. My thanks to Dr. Oyet for making them available.

Prerequisite: Either PM/ST 3411 or both M1001 and one of ST2501 or ST2560 or the former ST2511.

Course Evaluation

Five Assignments	15%
Midterm Test	20%
Project	15%
Final Exam	50%

Assignments: Assignments will be given every two weeks (approximately), and will be due in class on the date specified on the assignment handout. Late assignments will be accepted, but you will lose 10% of the assignment grade for each day the assignment is late. To make your assignments easier to grade, please make sure to only submit the relevant computer output with your assignment.

Project: You will work either individually, or in groups of 2, on a time series dataset from any source. There are many sources for time series data on the internet; I will provide a handout with some sources, and additional details, in a few weeks.

Your written report is due on or before **April 4, 2008**. Your report will be evaluated based on clarity of presentation, application of correct statistical methods, interpretation of results and creativity.

Computing: Computer work will comprise a great deal of some of the assignments, mainly using the statistical package Minitab. Minitab is available on the computers in the HH building (**HH3030/56**). It is also available in the lab in the chemistry building (**C2003/4**).

Notes.

1. You will be permitted to bring your text with you to the test and exam, but *only* to refer to tables in the textbook. I will discuss the use of other formula sheets for the test and exam later in the term.
2. The midterm test will be held on **WEDNESDAY, FEB. 27**. If you miss the test with a valid medical excuse, the value of the midterm will be added to your final exam.
3. The final exam will cover the entire course, and will be 2 hours in length.

Deferred Examination Policy:

Missing a final examination in a course is a matter with potentially grave consequences. A deferred examination will normally be granted only if it is the middle of three exams within 24 hours, or in cases of bereavement or serious medical problems. Application forms for deferrals are available from the General Office of the Department of Mathematics & Statistics (HH-3003). A request for deferral on grounds of bereavement must be accompanied by an official letter providing date of death and relationship of deceased to the student. A request for deferral for medical reasons must be accompanied by a note on medical letterhead, signed by a physician, and confirming indisputably that the student was unable to write the regularly scheduled examination. The Department does *not* grant deferred exams to students who claim to have been ill, told their doctor that they were ill, were unable to reach the examination room on time, or have misread or been confused in any way by the examination timetable.

Tentative Course Schedule and Important Dates

Week	Date	Topic, Sections in Text
1	Jan. 7–11	2.1, 2.3–2.5, 2.7–2.8 Background Review 3.1–3.3 Simple Linear Regression: Model, Least Squares Assignment 1 given out
2	Jan. 14–18	3.4 Model Assumptions 3.7 Correlation and Coefficient of Determination 4.1–4.5 Multiple Regression: Model, Estimation, Assumptions
3	Jan. 21–24	5.2–5.3 Residual Analysis 1.1–1.5 Introduction to Forecasting 6.1, 3.5 Modelling Trend Using Polynomials Assignment 2 given out
4	Jan. 28–Feb. 1	6.2 Detecting Autocorrelation 6.3 Types of Seasonal Variation 6.4, 4.9 Dummy Variables and Trig Functions
5	Feb. 4–8	3.6, 4.4, 4.6, 4.10 F-tests; Prediction Intervals 6.5 Growth Curve Models 6.6 First-Order Autocorrelation Assignment 3 given out
6	Feb. 11–15	7.1 Multiplicative Decomposition 7.2 Additive Decomposition
7	Feb. 18–22	Feb. 18, 20: NO CLASSES (STUDY BREAK) 8.1 Simple Exponential Smoothing Assignment 4 given out
8	Feb. 25–29	8.3 Trend Corrected Exponential Smoothing TEST ON FEBRUARY 27 (WEDNESDAY) 8.4 Holt-Winters Methods
9	March 3–7	8.4 Holt-Winters Method (continued) Mean, Variance, Covariance of Random Variables Assignment 5 given out
10	March 10–14	9.1 Stationary and Nonstationary Time Series Autocovariance and Autocorrelation Functions
11	March 17–21	Properties of ACF, PACF 9.2 Sample Autocorrelation and Partial Autocorrelation March 21: NO CLASS (GOOD FRIDAY)
12	March 24–28	9.1 Transformation of Nonstationary Series 9.3 Autoregressive and Moving Average Models
13	March 31–April 4	9.4 ARMA and ARIMA models; Box-Jenkins methodology 10.1 Estimation in ARMA models Tying up Loose Ends APRIL 4: PROJECTS DUE; LAST DAY OF CLASSES