

Statistics 3540: Course Review

Final Exam

- Date: Monday, April 14, 10:00–noon. Location: HH-3013.
 - Material Permitted: Calculator. Writing instrument (pencil, pen, crayon, etc.). Textbook (**ONLY FOR TABLES**). You may bring photocopies of needed tables if you prefer.
 - Formula Sheet: **Two (2)** sides of a **single (1)** 8.5×11 sheet of paper (regular size looseleaf). This must be handwritten, with neither photocopied text pages nor copies of computer output.
 - Format: Short answer (True/False, Fill in blanks, etc.): 20–25%. Long Questions: 75–80%. There will be a mix of theoretical and applied problems, similar to your midterm and assignments.
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Topics covered

The numbers in parentheses refer to the associated book sections. Note that some material was covered in class in more (or less) detail than in the text. **This list overrules any topics listed or not listed on original course syllabus:**

1. Hypothesis testing: Interpreting p-values, rejecting or not rejecting H_o . (Review handout)
2. Simple Linear Regression: Method of least squares, formulas, predicted values, residuals, r and R^2 . (3.1–3.4, 3.7)
3. Multiple Linear Regression: Material like in simple regression (4.1–4.5). Prediction intervals (3.6, 4.6). Residual analysis (5.2, 5.3).
4. Time Series Regression: components of time series; modelling trend, test about slope. Durbin-Watson test. (parts of ch.1, 3.5, 6.1–6.2).
5. Models with seasonal variation: Using indicator variables, F-test on model utility, t-tests on individual variables, PI for response variable (6.3, 6.4, 3.6, 4.4–4.6, 4.9). Partial F-test (4.10). Using Trig functions, dealing with nonconstant seasonal variation (6.3, 6.4).
6. Growth curves (6.5).
7. Modelling autocorrelation (6.6).
8. Multiplicative and Additive Decomposition (7.1, 7.2).
9. Exponential Smoothing: Simple and trend-corrected exponential smoothing (8.1, 8.3), Winters' Method (most of 8.4). State-space models (8.6).
10. Stationary Time Series:
 - (a) Theory and properties (Handout, lecture notes).
 - (b) Autocorrelation and partial autocorrelation functions (9.2, 9.3).
 - (c) Transforming a nonstationary series (9.2).
 - (d) AR, MA, ARMA, ARIMA models (9.2–9.4).
 - (e) Tentative model identification; estimation (9.2–9.4).
 - (f) Prediction and forecasting (9.3, 10.3). Choosing an appropriate model.