

ISYE 4803 SPECIAL TOPICS: REGRESSION AND FORECASTING

Required

Credit: 3-0-3

Prepared Prof, Fall 2007

Prerequisite(s): ISYE 2028

Catalog Description:

(nothing on catalog yet)

Text:

Forecasting, Time Series, and Regression by Bowerman, O'Connel, and Koehler, Duxbury Applied Series.

Objective

The objective of this course is to teach about the regression and forecasting models and their applications in various fields of science and engineering. It will teach the students how to build empirical models from real data and how to use them in predicting future events to solve important real life problems.

Topical Outline

1. Regression: Simple Linear Regression, Multiple linear regression, Inferences, Diagnostics, Transformations, Variable selection, Qualitative predictors, and Logistic regression.
2. Forecasting: Time series regression, Exponential smoothing, ARIMA models, and Transfer function models.

Outcomes and their relationships to ISyE Program Outcomes

At the end of this course, students will be able to:

- Formulate real life problems using regression and forecasting models.
- Collect appropriate data to estimate the models and understand which data are useful in solving the problem.
- Use statistical software to estimate the models from real data.
- Draw conclusions from the estimated models to solve the real life problems.

Course outcome \ Program Outcomes	a. apply math	b. data	c. IE method	d. team	e. problem solving	f. prof/ and ethical responsibilities	g. communication	h. global, eco, envi and soc context	i. continue to improve	j. current issues	k. participate in an organization
Formulate problems	H		M	M	H			M	M		
Collect data		H	L	M							L
Estimate models	H	H							M		
Draw conclusions				M	H		M	M	M		M

- H, M and L denote high, moderate and low relationships.
- Team projects are conducted

Evaluation of the important outcomes

1. A project will be assigned to a team of 2-3 students. Students are expected to identify a real life problem, formulate it using statistical models, collect necessary data, analyze it, draw conclusions, and present the solutions.
2. Homework problems will be used to evaluate student's ability to estimate models from data using statistical software.
3. Exams will be used for evaluating student's ability to draw conclusions from the statistical analysis of data.