Goal: Market response models are widely used in quantitative marketing analysis. Regression models (e.g., linear/nonlinear, logit, multinomial and Poisson) can be applied for linking sales/market shares/customer purchases with marketing mix (e.g., price and promotion activities). These statistical models are under the umbrella of generalized linear models (GLMs). This course covers the basic theory of GLMs and its applications in marketing decision making. Hazard rate and Bass diffusion models are also part of this course. Retailing and financial service examples are adopted for data analysis demonstration.

Prerequisite: Elementary statistics and computer skills; Intermediate microeconomics.

Statistical packages: SAS and Excel (Analysis toolpak)

Related Courses: 26:799:685 Supply Chain-Marketing Interface

Class Participation: Class participation is mandatory. Students are required to discuss class materials in class.

Homework: Students are required to further analyze the datasets used in class and demonstrate their results in the following week.

Projects: Students are required to write a mini-data analysis project and present the project results in class (see details on Pages 2-4). Two students form one project team.

Presentation: Students are required to give presentations based on journal papers (see details on Page 5). Two students form one presentation team.

Grades: 20% class participation and homework demonstration, 20% presentation and 60% project.
Mini-Project Guidelines

There are some basic steps you need to consider in order to produce a successful data analysis project. A simple guideline of what you should include in a project is listed below.

I. You need a question or problem. Statistics is a tool to help you answer a question. Make sure your topic is related to marketing and your applied methodology is related to GLMs.

II. Define your problem or question in clear, specific terms.

III. Develop your hypotheses. What do you expect to happen?

IV. Find out as much as you can about your question.
   • Has someone already done work on your question?
   • Is your question one for which there is an answer?
   • Collect research about your topic.

V. Design your study. Find or develop techniques and measurement instruments that will provide objective data pertinent to your hypotheses. Decide how you will analyze your data.

VI. Collect your data. Marketing datasets are widely available online.

VII. Analyze your data following the plan you developed.
   • Visualize/summarize data (charts, tables, histograms, and etc.)
   • Present your regression models and discuss alternatives

VIII. Interpret your results and draw conclusions relative to your hypotheses based upon your data and your analysis of the data. What’s the practical implication of your conclusions for managers?

IX. Write your results—write, rewrite, spell-check, rewrite and . . . PROOFREAD!
Format and Structure for Mini-Projects

1. Your project must be word-processed using a standard font (e.g., TimesNewRoman 12) and double-spaced.

2. All charts, data sheets and graphs should be done on the computer. Graphs and charts should have a title and properly labeled axes. You need graphs in BOTH your written project and on your visual aid.

3. When using variables, be sure to state what each represents. Give sufficient explanation of statistical formula and procedures.

4. All pages must be numbered.

5. Order of pages:
   - COVER SHEET—The first page of your project must be a cover sheet that includes your name(s), date and the title of your project.
   - EXECUTIVE SUMMARY—Briefly describe your research topic, conclusions and practical implications for managers.
   - TABLE OF CONTENTS
   - INTRODUCTION, PROBLEM, PURPOSE—This section should include the statement of your question, a statement as to why your project is important or relevant, and your null and alternative hypotheses. Also discuss what you expected to find.
   - RESEARCH—A summary discussion of your background research and information on related studies goes here.
   - METHODS AND PROCEDURES—This should include data sources and statistical models you choose.
   - RESULTS (ANALYSIS OF DATA)—Your data tables and graphs go here, interspersed with your narrative. This is also where you include all statistical tests (including calculations). Graphs and charts should be inserted into the appropriate location of your paper or referenced by page number if not in the body of the paper.
   - CONCLUSION—This is where you interpret your findings (what can you conclude or not conclude from your research) and offer managerial insights.
   - DISCUSSION—This should include any difficulties that occurred when collecting or analyzing data, as well as what you would change in a follow-up to your project. Limitations of your inferences should be discussed. Suggestions for further work in the area of your topic, as well as recommendations, are mentioned here.
   - WORKS CITED
   - APPENDICES—attach anything technical or supplementary.

6. Final project presentation (20-25 mins)
7. Hand in a hard copy of your project and send me the electronic version of your datasets, SAS codes, the project report and ppt presentation. Grading criteria: make your project interesting and worth learning!
Presentation

Each team will select one paper and give a formal lecture based on the paper. In the lecture (20-25 mins), you need to explain the research problem, the motivation, the model, and the solution to the problem. You also need to compare the paper to existing work and point out the contribution. Feel free to take you time to clearly explain the paper.

Besides the presenters, the rest of the class will serve as discussants. The main task of a discussant is to provide a critique of the paper presented: the significance of the problem, the suitability of the model, the limitations of modeling assumptions, the role that these assumptions play in obtaining results, and possible extensions. In addition, discussants should look for common themes or key issues that link related papers and enhance our understanding of the topic. Lastly, discussants are expected to raise challenging questions that would guide class discussion.

The presentation will be graded based on how well you motivate the research and how clearly you explain the model and results.

Samples of journal papers:


**Topics covered (tentative)**

**Recommended textbooks:**


**Topics:**

*Overview of marketing and modeling principles*

- Parts I, II and IV of BMM

*Review of statistics*

- Part III of BMM
- Chapters 1 and 2 of GLM

*Basic concepts of generalized linear models (GLM)*

- Chapters 3-5 of GLM

*Linear regression models*

- Part III of BMM
- Chapter 6 of GLM

Logit and multinomial models

• Chapters 7 and 8 of GLM

Credit scoring models and applications in database marketing


Poisson regression models

• Chapter 9 of GLM

Hazard rate and Bass diffusion models

• Chapter 10 of GLM