PROGRAM: MSc & PhD in Administration
SUBJECT: Statistics IA
LANGUAGE: English
PROFESSOR(S): Rafael Goldszmidt
WORKLOAD: 30h
REQUIREMENTS: Knowledge of descriptive statistics and fundamentals of statistical inference

TEACHING PLAN

1. Course Description

This course approaches the fundamentals of quantitative research methodology. Its main topics comprise correlation and causality; hypothesis testing for quantitative and qualitative response variables; ANOVA; estimation and inference in multiple linear regression models; assumptions of multiple regression models; moderation and mediation in multiple regression models.

2. Scope & objectives

This course aims at preparing the students to use quantitative methods in Social Science research. Its objectives include:

- To discuss the fundamentals of quantitative methods applied to Social Sciences, main types of research designs and their fit to the theoretical framework and hypothesis of a research project.
- To present statistical tools that can be used to test hypotheses with quantitative response variables (ANOVA, t-tests and multiple regression) and qualitative response variables (chi-square tests).
- To present the use of statistical models in different fields of Administration and different Sciences connected to Administration (e.g. Psychology, Economics, Political Science), comparing used terminologies and preferred models.

3. Learning outcomes

3.1. Key learning outcomes

It is expected that, at the end of the course, the students will be able to identify the most adequate research design, the type of data to be collected, as well as the statistical tools that are more suitable to analyze the data in a research project.

3.2. Complementary learning outcomes

The students should be able to use statistical software (Stata) to analyze cross section data. It is also expected that they are capable of reporting the statistical results in an adequate format for publishing in international journals.

4. Course methodology

Classes will include lectures on research design and statistical tools as well as the discussion of empirical papers in Administration that apply the topics presented in class. The course is focused in the link between theory and method and the application of statistics to applied research. Students are expected to do exercises lists and case studies. In the case studies, the students should rewrite the methods, analysis and conclusions sessions of a published paper, having as input its theoretical framework, hypothesis and dataset.

5. Detailed course content

Dates	**Topic**	**Activities [1] (bibliography/key readings, assessment, seminars, etc)**
Class 1 18/01/2018	Fundamentals of quantitative research design in Social Sciences. Correlation and Causality. Experimental, quasi-experimental and non-experimental designs.	Murnane and Willet (2011, chap. 2), Wooldridge (2012, chap. 1). **Case study 1** - (to be delivered next week).
Class 2 01/19/2018	Analysis of Variance (ANOVA).	Warner (2013, chap 6).
Class 3 01/25/2018	Tests for comparing means - paired and independent samples. Chi-square homogeneity and independence tests.	Warner (2013, 5.1 to 5.10 and 22.1 to 22.7), Hall et al (2013), Waber et al (2008). **List of exercises 1** (to be delivered next week). **Case study 2** (to be delivered in two weeks).
Class 4 02/01/2018	Simple linear regression - estimation and inference	Wooldridge (2012, chap. 2).
Class 5 02/08/2018	Multiple linear regression – estimation and inference. Dummy variables.	**Presentation of case 2.** Wooldridge (2012, chap. 3 and 4, 6.1, 6.3 and 7.1 to 7.3)

[1] The professor is free to conduct occasional assessments without prior notice to student(s).

Class 6 02/22/2018	Multiple linear regression - Multicollinearity. Scaling. Functional forms.	Wooldridge (2012, 6.2 and 8.1 to 8.4). **List of exercises 2** (to be delivered next week).
Class 7 03/01/2018	Mediation in multiple regression models	Warner (2013, chap. 10 and chap 16.1 to 16.12)
Class 8 03/15/2018	Moderation in multiple regression models	Warner (2013, 15.1 to 15.19), Wooldridge (2012, 7.4) **List of exercises 3** (to be delivered next week). **Case study 3** (to be delivered in two weeks)
Class 9 03/22/2018	Compared use of statistical models in different fields of Administration and related fields. Transparency in social science research.	Sha et al (2013), Chan et al (2013), Ifcher and Zarghamee (2011). Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011).
Class 10 03/29/2018	Revision Class	
Class 11 04/02/2018	Final Exam (starts at 9:00 a.m.)	

* readings are expected after each class, except for underlined references, which should be read in advance.

6. Assessment procedures

Students assessment will consist of assignments to be developed by groups of **2 students**, comprising 50% of the final grade and a final individual exam which will compose the other 50% of the final grade.

7. General guidelines for the graduate program[2]

[2] Approved by the Undergraduate Program Collegiate in a meeting on October 4th, 2011, and in conformity with The National Educational Bases and Guidelines Law, with FGV/EBAPE's internal by-laws, and with the Undergraduate Program's regulations.

3 The student is guaranteed the right to a full defense as per the School's internal regulations

As a general rule relating to the ethical principles and the code of conduct which steer its academic environment, EBAPE sets down the following:

- Autonomy and responsibility correspond to values which, when transformed into action, highlight the importance of EBAPE's mission of producing and disseminating knowledge of Administration. Consequently, it is the professor's responsibility to conduct roll call at every class, and absences will only be justified if they comply with the applicable legislation (see details in the Student Manual).
- We recommend that the use of communication equipment such as cell phones, radios and similar equipment, as well as notebooks or equivalent, should not be permitted in the classroom, so as to avoid interfering with the teaching and learning processes.
- Resorting to fraudulent measures of any kind on the part of students during any of the evaluation phases will lead to a zero grade being awarded and the immediate referral of the case to the undergraduate program department for examination of the facts.

8. REQUIRED READINGS

Textbooks

Murnane, Richard J., and John B. Willett. *Methods matter: Improving causal inference in educational and social science research*. Oxford University Press, 2010.
Warner, Rebecca M. *Applied statistics: from bivariate through multivariate techniques: from bivariate through multivariate techniques*. Sage, 2012.
Wooldridge, J. M. *Introductory Econometrics: A modern approach*. Thomson. 5 ed. 2015.

Papers

Chan, S. C. H., Huang, X., Snape, E., & Lam, C. K. (2013). The Janus face of paternalistic leaders: Authoritarianism, benevolence, subordinates' organization‐based self‐esteem, and performance. *Journal of Organizational Behavior*, *34*(1), 108–128.
Hall, C. C., Zhao, J., & Shafir, E. (2013). Self-Affirmation Among the Poor: Cognitive and Behavioral Implications. *Psychological Science*. doi:10.1177/0956797613510949
Ifcher, John, and Homa Zarghamee. "Happiness and time preference: The effect of positive affect in a random-assignment experiment." *The American Economic Review* (2011): 3109-3129.
Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, *338*(6107), 682–685.
Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: undisclosed flexibility in data collection and analysis allows presenting anything as significant. Psychological Science, 22(11), 1359–66.
Waber, R. L., Shiv, B., Carmon, Z., & Ariely, D. (2008). Commercial features of placebo and therapeutic efficacy. *JAMA : The Journal of the American Medical Association*, *299*(9), 1016–7. doi:10.1001/jama.299.9.1016

Additional papers will be assigned during the course.

9. ADDITIONAL READINGS

Cohen, P.; Cohen, J.; West, S. Aiken, L. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. 3ed. Routledge Academic, 2002.
Neuman. W.L. Social *Research Methods: Qualitative and Quantitative Approaches. 7ed*. Allyn & Bacon, 2009.

10. Professor's mini-résumé

Rafael Goldszmidt is an assistant professor at FGV-EBAPE, teaching in the graduate and undergraduate programs. He has worked as a consultant in statistical modeling for private companies, such as Itau and Editora Abril as well as for international organizations including FAO and IICA. His work has been published in international academic journals as the Journal of Business Research, International Business Review and Journal of World Business and by publishers as Emerald Group and Springer. His main research interests include statistical models applied to administration, microfinance and behavioral design of public policy.