

COURSE: QTRM - Quantitative Research Methods
DEPARTAMENT: TDS – Technology & Data Science
PROGRAM: CMCD AE
SEMESTER: 1st 2024 – 2nd BIMESTER (Fridays, 13:00-16:50)
CLASS-HOURS: 30 hours
PROFESSOR: Otavio Sanchez
LANGUAGE: English/ Portuguese

COURSE DESCRIPTION

It is considered a relevant skill for a researcher to be able to understand, choose, and employ state-of-the-art data analysis techniques. The quantitative approach lies among the fundamental research traditions in social science in the sense that no successful researcher can afford to be less than proficient.

This course intends not only to be about the use of statistics in research but also to navigate the interconnected details of quantitative research design and its implications related to the method details. Besides being able to reproduce techniques, this course is oriented to prepare MSc and PhD students to understand and execute the most appropriate quantitative technique available fully.

It will be built around supporting software like R, whereas SPSS and STATA can also be employed. However, its most crucial knowledge refers to the strategic decisions a skilled researcher must make regarding the techniques and choices that result from a proper analysis strategy. Multiple high-level ABS 4 and 4* papers will be examples of the most updated analytical requirements, the conjunction of sequential tests, and results reports.

LEARNING GOALS

The course's learning objectives are presented in the following table, indicating how they contribute to the CMCDAE's learning objectives.

CMCDAE Main topics	Course Objectives	Contribution *
Qualitative research methods	---	○○○
Quantitative research methods	Enable students to appropriately recognize the merits and choose among a set of quantitative data analysis strategies usually employed in social research fields.	●●●
Research topics and theory knowledge	---	○○○
Research procedures	Enable students to adequately run analyses based on quantitative research tradition, employing statistical inference assumptions and procedures.	●●●
Relevance and innovation in research	Support students in producing relevant studies based on the quantitative tradition.	●○○
Development of scientific papers	Support students in interpreting and reporting high-level quantitative research.	●●○

LEVEL OF CONTRIBUTION IN THE CORRESPONDING PROGRAM TOPIC			
High	Medium	Low	None
●●●	●●○	●○○	○○○

PREVIOUSLY REQUIRED KNOWLEDGE

A broad understanding of basic, exploratory statistics will be helpful.

CONTENT AND METHODS

1. Quantitative Research (QTR) Strategies
 - 1.1. Basics of measurement theory, variable types, exploratory analysis
 - 1.1. Currently recognized high-level quantitative research methods
2. Getting back to the principles
 - 2.1. Introduction of Statistical Inference
 - 2.2. Principles of Sampling
 - 2.3. Parameter estimation
 - 2.4. Point and interval estimation
3. Using QTR to advance theories
 - 3.1. Assumptions of hypothesis tests work
 - 3.2. How hypothesis tests work
 - 3.3. Types of errors
4. Common QTR strategies, assumptions, when to use them
 - 4.1. One-sample tests
 - 4.2. Two-sample tests
 - 4.3. ANOVA: Analysis of variance
 - 4.4. Analysis strategy: The conjunction of proper sequential tests
 - 4.5. Examples of top papers using these techniques
5. Regressions, assumptions, when to use them
 - 5.1. Simple and Multiple Regression
 - 5.2. Estimation and testing parameters
 - 5.3. Hierarchical Regressions
 - 5.4. Problems with regressions
 - 5.5. Examples of top papers using regressions

The classes are based on previous readings, discussions, and hands-on exercises. The micro-activities workshop format is distributed among the classes, directing the use of the methods to the immediate research interest of the participants.

As additional reading of top international journal papers in the field of interest might be needed, reading and interpreting English skills are of great importance for consistent learning during the course. Students must be prepared to dedicate four extra class hours weekly to readings and solving exercises.

ASSESSMENT

TEST	WEIGHT	DESCRIPTION
E1	20 %	Participation and hands-on: Effective hands-on work, consistent prior reading and preparation, as well as participation in the classes
E2	40 %	Research proposal: An individual research proposal using adequate Quantitative Analyses (QTA) (*)
FE	40 %	Final paper: Upload and presentation of a typical QTA and reporting the results (**)

(*) *The focus of the analysis can be one of the following:*

1. *An original analysis based on participants' own data.*
2. *A replication of a paper which used QTA, chosen from an ABS 4 or 4* journal*

(**) *A Word document formatted as Times New Roman 12, with a line spacing of 1.5, a justified paragraph, and at least 1000 words excluding the title page, references, and appendices. It should (1) introduce the topic, (2) present the dictionary of variables, and (3) adequately report and discuss the results of the QTA. Additionally, (4) add an appendix with the R script (or SPSS commands, STATA do file) documenting your analysis (please add the key comments to the command lines). Also, (5) upload the dataset used.*

PROFESSOR MINI CV



Otavio Sanchez

Associate Professor of Information Systems and Quantitative Methods at Ph.D. & Master Courses of Fundacao Getulio Vargas FGV-EAESP and Visiting Scholar at the University of Arizona. His research interests range from strategy and management of information systems, information economics, behavioral economics, information privacy, and security. His research has appeared in high-impact journals like the Journal of the Association for Information Systems, Communications of the ACM, the International Journal of Project Management, and Information Systems Frontiers. He has been a referee for the top IS journals

such as MIS Quarterly, Journal of Management Information Systems, Journal of Strategic Information Systems, Journal of the Association for Information Systems, European Journal of Information Systems, Information Systems Management, and the premier international conferences in IS field, International Conference on Information Systems (ICIS) and European Conference on Information Systems (ECIS). He serves as Senior Editor of the AIS Journal of Transactions on Replication Research (TRR – <https://aisel.aisnet.org/trr/>), is a former member of the Scientific Committee of the Information Systems Division at ANPAD – Brazilian National Post-graduation Programs Association (2013-2014), and its Division's Head (2015-2017). He is currently the leader of the AATI – Administration, Analysis, and Information Technology research stream of FGV-EAESP. His entire academic CV is available at <http://lattes.cnpq.br/3744651482348616>.

CLASSES SCHEDULE (TBD)

REFERENCES

- Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. 2016. Statistics for business & economics. Cengage Learning.
- Field, A., Miles, J., and Field, Z. 2012. Discovering Statistics Using R. Los Angeles: SAGE.
- Newbold, P. W.L. Carlson & B.M. Thorne 2013. Statistics for Business and Economics, 8th ed. , Pearson
- McClave, J. T., Benson, P. G., & Sincich, T. 2008. Statistics for business and economics. Pearson Education.