Quantitative Methods/Statistics for Social Research

POL-UA 9800 F01/SOC-UA 9302 F01

Instruction Mode:
Online

Brightspace course site
https://brightspace.nyu.edu/d2l/home/161087

Spring 2022

If you are enrolled in this course 100% remotely and are not a Study Away student for NYU Florence, please make sure that you've completed the online academic orientation via Brightspace so you are aware of site specific support structure, policies and procedures. Please contact florence.academicsupport@nyu.edu if you have trouble accessing the Brightspace site.

Syllabus last updated on: [08/02/2022]

Lecturer Contact Information
TBA

Units earned
4

Course Details

- Meeting Days and Times: Mo 8:30AM-11:15AM

- All times are Central European Time (CET) Please note that there is a gap in when Daylight Savings Time (DST) begins in Europe and the U.S. In the U.S., DST begins on Sunday, 13 March 2022 when clocks will be set 1 hour forward. In Europe, DST begins Sunday, 27 March 2022.
- Remote Participants: Your instructor will provide you with the Zoom link via NYU Brightspace.
- COVID-related details: In the interest of protecting the NYU Florence community, we are closely following CDC guidance around COVID-19 and adjusting our recommendations and policies accordingly. Your health and well-being is our top priority.

Course Description
In our society the need for deep understanding of what is going on translates into a need to keep track what has happened, how to outline trends, plan the future knowing the present or the past. We have all heard about demographic pressure, social policies, health care planning, inflation, market volatility: these are all concepts, which rely heavily on statistical information. Changes have to be managed properly and in an informed way: scientific experiments be they on a drug, on fertilizer or airbags must be planned as to ensure their validity. Total quality in production is a statistics-based philosophy of management, and if you like a commercial it is also because a statistician has provided information about consumer tastes and behavior. In this course, we will introduce the tools of statistics but most importantly, we will try to understand the rationale behind statistics. This course will cover the following topics: descriptive statistics, elementary probability (which is necessary for understanding inferential statistics), and inferential statistics. Correlation and regression will be presented as descriptive statistics at the end of the course.

Course Objectives
On completion of this course, students should:

- Have knowledge about basic concepts in statistics;

- Own ability to apply statistical methods for collection, processing and analysis of quantitative data particularly such linked to the field of Economy, Business and Social Science;

- Assess the role of randomness and variability in different contexts;

- Have made relevant connections between theory and real world examples, through references to media material, readings or case studies.

Assessment Components

- Attendance and Academic Commitment**: 20%
- Written Assignments (Six Graded Problem Sets): 20%
- Midterm Exam: 25%
- Final Exam: 35%

Failure to submit or fulfill any required course component results in failure of the class.

NB: Commitment: A student's commitment will be evaluated based on active participation, involvement and contribution in the course. This may include, but is not limited to, presence at synchronous class sessions, timely submission of predetermined course assignments to the instructor, collaboration with peers in group course work both during class time or independently outside of class time, individual oral or written contributions to synchronous course time through the chat function, in person discussion, or in individual office hours with the instructor.

Assessment Expectations:

- **Grade A:** The student makes excellent use of empirical and theoretical material and offers structured arguments in their work. The student writes comprehensive essays/exam questions and their work shows strong evidence of critical thought and extensive reading.
- **Grade B:** The candidate shows a good understanding of the problem and has demonstrated the ability to formulate and execute a coherent research strategy
- **Grade C:** The work is acceptable and shows a basic grasp of the research problem. However, the work fails to organize findings coherently and is in need of improvement
- **Grade D:** The work passes because some relevant points are made. However, there may be a problem of poor definition, lack of critical awareness, poor research
- **Grade F:** The work shows that the research problem is not understood; there is little or no critical awareness and the research is clearly negligible
- *Please note, Stern Business courses will adhere to the Stern Grading

Grading Guidelines

Required Grading Language for Core Courses
At NYU Stern, we strive to create courses that challenge students intellectually and that meet the Stern standards of academic excellence. To ensure fairness and clarity of grading, the Stern faculty have adopted a grading guideline for core courses with enrollments of more than 25 students in which approximately 35% of students will receive an "A" or "A-" grade. In core classes of less than 25 students, the instructor is at liberty to give whatever grades they think the students deserve, while maintaining rigorous academic standards.

Attendance Policy
For a detailed explanation of the global attendance policy, see the NYU Florence Present vs. Absent Flowchart.
Exams, tests and quizzes, deadlines, and oral presentations that are missed due to illness always require a doctor's note as documentation.
The Global Attendance Policy is posted in the Academic Policies tab in Brightspace, on the NYU Florence Student Portal website, and is posted around campus.
After you have read and reviewed the policies, if there is anything that still needs further clarification or raises a question, please reach out to florence.academicsupport@nyu.edu.

Final exams
Final exams must be taken at their designated times. Should there be a conflict between your final exams, please bring this to the attention of the Academics team. Final exams may not be taken early, and students should not plan to leave the site before the end of the finals period.

Late Submission of Work
Please refer to Academic Policies in Brightspace.

Required Text(s)

Introductory Statistics from OpenStax this textbook is available for free online: in web view, and PDF formats. You can also choose to get a print version from OpenStax on Amazon.com (PRINT BOOK ISBN-10 1-938168-20-8).

Further material (slides, handouts, solutions, papers, ecc) will be posted online in the Resources folder of NYU Brightspace.

All readings are available online on the NYU Brightspace course site. Hard copies of some textbooks are available for consultation and semester-long loans in the Villa Ulivi Library. Please email florence.library@nyu.edu to reserve a copy. To request scans from books on reserve please fill out the Ulivi Library Book Scan Form.

Supplemental Text(s)

Diez D. et al. (2019). OpeniIntro Statistics, Fourth Edition This book may be downloaded as a free PDF at https://leanpub.com/openintro-statistics

The journal *Significance* edited by the Royal Statistical Society and the American Statistical Association is a source of articles on statistical methodology applied to current issues presented in a non-technical manner. It is an excellent base for choosing a topic for discussion in class. This is the link to the magazine home page. The journal can be freely accessed at this URL

Additional Required Equipment

During class you need your laptop to perform computations. The statistical software Stata can be accessed via the NYU Virtual Lab: https://vcl.nyu.edu/

Quizzes may be conducted during the class session.

Class Assignments and Topics

Session 1 – January, 31

Topics: Introduction to Statistics. Sampling and Data
Readings: Ch. 1 (1.4 on your own)

Session 2- February, 7

Topics: Summarizing data: Descriptive Statistics I
Readings: Ch. 2: Sections 2.1, 2.2, 2.3, 2.4, 2.5
Assignments: Problem Set 1 – due February 14

Session 3- February, 14

Topics: Descriptive Statistics II. Introduction to Stata.
Readings: Ch. 2: Sections 2.6, 2.7 & 2.8.

Monday, February, 21 - No Class

Session 4 – Friday February, 25 Make-up Day

Topics: Probability.
Readings: Ch. 3
Assignments: Problem Set 2 – due February 28

Session 5- February, 28

Topics: Discrete random variables. The binomial distribution.
Readings: Sections 4.1, 4.2 & 4.3
Assignments: Problem Set 3 – due March, 7

Session 6- March, 7

Topics: Continuous Random Variables. The Uniform distribution.
Readings: Ch. 5: Sections 5.1, 5.2.

Session 7- March, 14

Midterm on the first 5 Chapters

Monday, March 14 - Sunday, March 20: Spring Break

Session 8- March 21

Topics: The Normal distribution.
Readings: Ch. 6

Session 9- March 28

Topics: Foundations of statistical inference. The Central Limit Theorem.
Readings: Ch. 7 Sections 7.1 and 7.3 (skipping CLT for sums).
Assignments: Problem Set 4 – due April 4

Session 10- April 4

Topics: Confidence intervals
Readings: Ch. 8: Sections 8.1, 8.2 & 8.3

Session 11 - April 11

Topics: Hypothesis Testing I
Readings: Ch. 9

Monday, April 18 -No Classes - Local Holiday

Session 12 – Friday, April 22: Make Up Day

Topics: Hypothesis Testing II
Readings: Ch. 9
Assignments: Problem Set 5 – due April 29

Monday, April 25 - No Classes - Local Holiday

Session 13 Friday, April 29: Make Up Day;

> <u>Topics</u>: Linear Regression and correlation I
> <u>Readings</u>: Ch. 12: Sections 12.1, 12.2 & 12.3

Session 14 May 2

> Topics: Linear Regression and correlation II
> Readings: Ch. 12: Sections 12.4, 12.5
>
> <u>Assignments</u>: Problem Set 6 – due May 9

Session 15 – May 9

> Buffer and Review Session

May 16   FINAL EXAM on chapters 6-12

Your Lecturer

Carla Rampichini PhD is Full Professor of Statistics at the University of Florence, Department of Statistics, Computer Science, Applications (link). Her research interests relate mainly to random effects models for multilevel analysis, program evaluation and causal inference. Her methodological work is joined with applications on real data, often concerning the effectiveness of universities, but she also made applications on public health, demographic and socio-economic data. She presented her research work at many international and Italian conferences and workshops. She has authored several scientific articles on statistical models, with applications to education, health and socio-economic data. Some relevant results of her research work on multilevel models have been published on international journals, such as Statistical Modelling, Structural Equation Modeling, and Journal of Educational and Behavioral Statistics.

Academic Honesty & Plagiarism

As the University's policy on "<u>Academic Integrity for Students at NYU</u>" states: "At NYU, a commitment to excellence, fairness, honesty, and respect within and outside the classroom is essential to maintaining the integrity of our community. By accepting membership in this community, students take responsibility for demonstrating these values in their own conduct and for recognizing and supporting these values in others." Students at Global Academic Centers   must   follow   the   University   and   school   policies.

NYU takes plagiarism very seriously; penalties follow and may exceed those set out by your home school. Your lecturer may ask you to sign a declaration of authorship form, and may check your assignments by using TurnItIn or another software designed to detect offences against academic integrity.

The presentation of another person's words, ideas, judgment, images, or data as though they were your own, whether intentionally or unintentionally, constitutes an act of plagiarism. It is also an offense to submit work for assignments from two different courses that is substantially the same (be it oral presentations or written work). If there is an

overlap of the subject of your assignment with one that you produced for another course (either in the current or any previous semester), you MUST inform your professor.

For guidelines on academic honesty, clarification of the definition of plagiarism, examples of procedures and sanctions, and resources to support proper citation, please see:

NYU Academic Integrity Policies and Guidelines

NYU Library Guides

Inclusivity Policies and Priorities

NYU's Office of Global Programs and NYU's global sites are committed to equity, diversity, and inclusion. In order to nurture a more inclusive global university, NYU affirms the value of sharing differing perspectives and encourages open dialogue through a variety of pedagogical approaches. Our goal is to make all students feel included and welcome in all aspects of academic life, including our syllabi, classrooms, and educational activities/spaces.

Attendance Rules on Religious Holidays
Members of any religious group may, without penalty, excuse themselves from classes when required in compliance with their religious obligations. Students who anticipate being absent due to religious observance should notify their lecturer and Office of Academic Support in writing via e-mail one week in advance. If examinations or assignment deadlines are scheduled on the day the student will be absent, the Academics Office will schedule a make-up examination or extend the deadline for assignments. Please note that an absence is only excused for the holiday but not for any days of travel that may come before and/or after the holiday. See also University Calendar Policy on Religious Holidays

Pronouns and Name Pronunciation (Albert and Zoom)
Students, staff, and faculty have the opportunity to add their pronouns, as well as the pronunciation of their names, into Albert. Students can have this information displayed to faculty, advisors, and administrators in Albert, NYU Brightspace, the NYU Home internal directory, as well as other NYU systems. Students can also opt out of having their pronouns viewed by their instructors, in case they feel more comfortable sharing their pronouns outside of the classroom. For more information on how to change this information for your Albert account, please see the Pronouns and Name Pronunciation website.

Students, staff, and faculty are also encouraged, though not required, to list their pronouns, and update their names in the name display for Zoom. For more information on how to make this change, please see the Personalizing Zoom Display Names website.

Moses Accommodations Statement
Academic accommodations are available for students with documented and registered disabilities. Please contact the Moses Center for Student Accessibility (+1 212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance. Accommodations for this course are managed through NYU Florence.

Bias Response

The New York University Bias Response Line provides a mechanism through which members of our community can share or report experiences and concerns of bias, discrimination, or harassing behavior that may occur within our community.

Experienced administrators in the Office of Equal Opportunity (OEO) receive and assess reports, and then help facilitate responses, which may include referral to another University school or unit, or investigation if warranted according to the University's existing Non-Discrimination and Anti-Harassment Policy.

The Bias Response Line is designed to enable the University to provide an open forum that helps to ensure that our community is equitable and inclusive.

To report an incident, you may do so in one of three ways:

- Online using the Web Form (link)

- Email: bias.response@nyu.edu

- Phone: 212-998-2277

- Local Telephone: 055 5007277