

**STA 4930: Overseas Studies in Statistics
Perspectives on the History of Statistics: English Origins
Spring 2022**

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Course Description and Objectives

Course Description: This study abroad program takes students to the historical beginnings of the discipline of statistics in England. The discipline of statistics represents a number of different philosophies (e.g., Bayesian, frequentist) as well as heated debates between Fisher and Pearson in the early literature. Students will visit sites, such as Rothamsted Research Station, Bletchley Park, and the University of Cambridge, which are linked to the birthplace of modern statistics.

Prerequisite: Junior or Senior Statistics or Data Science major.

Learning Objectives: Students taking this course will:

- i) understand the basic historical motivations behind several key advances in statistics.
- ii) develop their capacity to understand the contemporary world in the larger framework of tradition and history.
- iii) be introduced to the ways in which modern scholars, by interpreting the past, can think critically about the present and future.
- iv) develop their ability to better research historical questions and to present statistical history in written forms.

Course Materials

Required:

Salsburg, D., *The Lady Tasting Tea – How Statistics Revolutionized Science in the Twentieth Century*, Owl Books, 2001

Stigler, S., *The Seven Pillars of Statistical Wisdom*, Harvard College, 2016

Recommended:

Johnson, S., *The Ghost Map, The Story of London’s Most Terrifying Epidemic and How It Changed Science, Cities and the Modern World*, Penguin, 2006.

McGrayne, S., *The Theory That Would Not Die, How Bayes Rule Cracked the Enigma Code*, Yale University Press, 2011

Course Content

This program will focus on the following statistical and data science themes:

Gathering Information

The Royal Statistical Society, founded in 1834, is one of the world's most distinguished and renowned statistical societies. Not only is it the learned society for statistics in Britain, it also promotes statistics for the public good. The National Archives Museum in Kew, London, is the UK government's official archive containing 1000 years of history from the Domesday Book to the present with records from parchment and paper scrolls through to digital files.

Associated Activities:

- Students will visit the RSS central office in London and hear about the role that statistics and data analysis can play in society by attending a lecture.
- While at the RSS, we will also visit the nearby tomb of Thomas Bayes.
- Students will visit the National Archives Museum in Kew, London and attend talks on topics such as the Blue Books of Statistics and Census Records in addition to a general introduction to the NA and how to use archival records.

Experimental Design

Rothamsted Research Station is where Sir Ronald Fisher conducted his historic agricultural experiments giving birth to the subject of Experimental Design. Cambridge University, founded in 1209, is one of the oldest universities in the world. Some notable scientific alumni include: Sir Isaac Newton, Stephen Hawking, Alan Turing, Charles Babbage.

Associated Activities:

- Students will attend talks given by the research teams at Rothamsted Research Station and then take a trip out to the fields with a guide to see how modern agricultural experiments are conducted.
- Students will take a two-hour private guided walking tour of Cambridge University with a Science theme.

Data Visualization

In both the Florence Nightingale Museum and the Science Museum, London, we will see how statistical diagrams came to be first used in the study of deaths and diseases during the 1850's.

Associated Activities:

- Students will take a guided tour of the Florence Nightingale Museum. In the Winton Gallery of the Science Museum (see below) on the second floor (mathematics, computing and information) they will see the early works of Florence Nightingale.

Early Computers

In London, we will look at early computers and be able to see how innovation in information and communication technology have transformed our lives.

Associated Activities:

- Students will take a guided tour of the Winton Gallery in the Science Museum. The Winton Gallery contains some of the earliest computing devices such as the Babbage's Analytical Engine.

Cryptography

At Bletchley Park Estate we will learn how Alan Turing and the team of statistical “code breakers” were able to break the Enigma code and shorten the Second World War.

Associated Activities:

- Students will attend a lecture by a guest speaker in the hotel conference room on the mathematics behind code breaking the evening before our visit to Bletchley Park.
- Students will attend a four-hour guided tour of Bletchley Park which includes a talk on “The Story of Enigma”.

Epidemiology

As London's 1854 cholera outbreak took hold, a physician ultimately solved the most pressing medical riddle of that time, offering us a unique insight into the nature of scientific inquiry.

Associated Activities:

- Students will locate the site of the 1854 cholera outbreak in central London to learn how one of the world's first graphical analyses “The Ghost Map” was created.
- Students will attend a short lecture on the history of this graphical analysis prior to visiting the site.

Course Assessments

1. Reading Quizzes: In the semester preceding the travel component of the program, students will read and answer questions covering material in the two required course books. The purpose of these readings is to provide the required background to connect academic studies to their historical foundations, foundations which will be visited in this program. The book quizzes will be posted on the Canvas course page for students to complete.

The Lady Tasting Tea (TLTT): There will be nine reading quizzes covering material from the chapters in TLTT. This book examines how statistics has revolutionized science in the twentieth century and its impact on our everyday lives.

The Seven Pillars of Statistical Wisdom (SPSW): There will be seven reading quizzes covering material from the chapters in SPSW. In this book Stephen Stigler sets forth the seven foundational ideas of statistics—a scientific discipline related to but distinct from mathematics and computer science and one which often seems counterintuitive.

2. Reflection Paper: Upon completion of the travel component of the program, students will submit a 750-1,000-word report which highlights one of the major themes of the program (see list below). Students will upload their final reflection paper to the Canvas course page within 7 days of the completion of travel component of course.

- 1) Cryptography
- 2) Data Visualization
- 3) Early Computers
- 4) Epidemiology
- 5) Experimental Design
- 6) Gathering Information

In this paper students will describe how their selected theme relates to their major and reflect on how this study abroad program has enhanced their awareness of statistics by providing historical context to help them understand the subtleties and complexities of science.

3. Participation: All students are expected to actively participate in all aspects of this course and program. The success of this course is dependent upon the students taking part in organized activities and contributing to group discussions. Prior to departure, we will have an on-campus group orientation to discuss both academic aspects and more practical issues (e.g., vaccinations, food and water, health, individual safety, travel, money, customs, and behavior).

Additional Comments on Grading: Your instructors truly want your visit to England to be special, unforgettable, transformative, and enjoyable. However, for this to happen, you will need to prepare for each daily activity, participate in all activities, collaborate with the other course participants and with the local experts (e.g., guides and researchers), and keep up with your assignments (e.g., pre-departure reading quizzes). Attendance at all specified (i.e., in-class and in-field) activities is mandatory. Absences will only be excused because of illness or personal

emergency. Unexcused absences or tardiness will be penalized by a 5% deduction from your grade. Late work will be penalized 5 points each day.

GRADING

TLTT Reading Quiz	9@10 points each =	90 points
SPSW Reading Quiz	7@10 points each =	70 points
Reflection Paper		240 points
Participation		<u>500 points</u>
Total Points		900 points

GRADING SCALE

Points	Grade
800 - 900	A
700 < 800	B
600 < 700	C
500 < 600	D
< 500	E

Course Policies

Grading Policies:

*Students are required to notify the instructor in of any issues pertaining to the grade of a graded assignment no later than the last day of the program/course, unless there are any pending graded assignments, but not to exceed a week after the completion of the program/course.

*If you have a disability that requires academic accommodation, contact the Disability Resource Center (DRC). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

* Incompletes are only assigned when extraordinary circumstances (such as an accident, or extended hospitalization), arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete. Information on Medical Withdrawal can be found at <https://umatter.ufl.edu/> . Information on how to Drop a class can be found in UF's Academic Catalog <https://catalog.ufl.edu/> and <https://catalog.ufl.edu/UGRD/academic-regulations/dropping-courses-withdrawals/>

*There is no "extra credit" or forgiven grades – you are responsible for all your work done (or left undone).

Honor Code on Reading Quizzes and Reflection Paper: You are required to abide by the University of Florida Student Honor Code. Any violation of the academic integrity expected of you will result in a minimum academic sanction of **a failing grade on the assignment or assessment**. Any alleged violations of the Student Honor Code will result in a referral to Student Conduct and Conflict Resolution. Please review the Student Honor Code and Student Conduct Code at sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

The Honor Code will be enforced for **all assignments**.

Privacy Policy: Student records are confidential. Only information designated “UF directory information” may be released without your written consent. This applies to parents or anyone else who contacts me about your grades.

Faculty Course Evaluations: Student feedback is welcomed by the instructor and beneficial to future students in the course. Students are requested to provide feedback on the quality of instruction in this course by completing a brief confidential evaluation towards the end of the semester at <https://evaluations.ufl.edu>. Summaries of the evaluation results can be found at <https://evaluations.ufl.edu/results>.

Other University Services

U Matter, We Care: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Sexual Assault Recovery Services (SARS): Student Health Center, 392-1161

University Police Department, 392-1111 (or 9-1-1 for emergencies),
<http://www.police.ufl.edu>

Counseling and Wellness Center, Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

UF International Center Study Abroad:352-273-1539.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.