Math 494: Cryptography and War:
How Mathematicians Saved Democracy
Course Syllabus

Course Goals: This upper-division course has two goals. The first is to explore the mathematics of cryptography and cryptanalysis. In the process of doing so, we will investigate several other areas of mathematics including linear algebra, number theory, and probability. The second goal of this course is to provide a unique study-abroad experience. To meet this goal there will be a number of field trips that will enhance our study of mathematics.

Prerequisite: Math 250 or Math 160 with C- or better.

Participation: I expect every member of this course to be an active participant. That means that you must do all homework necessary to prepare for class, be willing to present material to your classmates, and be active in group and individual exercises. Attendance in class is mandatory. An unexcused absence will result in significant loss of participation points, and repeat offenders will be sent home.

Class: The class will meet Monday through Thursday from 9-12 in the morning, starting Monday, June 29 and ending Thursday, July 16.

Field Trips: The class will include six mandatory field trips and one optional field trip. The field trips will all be paid for as part of your tuition, plus some meals might be included. The time, meeting place, and any additional details will be provided later. The tentative field trip schedule is:

Sunday, June 28	London Walk, Churchill War Rooms
Tuesday, June 30	Tower of London
Thursday, July 2	British Museum (optional)
Tuesday, July 7	Play: The Curious Incident of the Dog
Thursday, July 9	Bletchley Park (Class starts at 8AM)
Monday, July 13	Science Museum
Wednesday, July 15	Top Secret Location Wait for Encrypted Message

Additionally, the following events will take place for all the London classes:

Friday, June 26	Orientation
Sunday, June 28 (Evening)	London Eye and Dinner
Friday, July 3 (All Day)	Trip to Oxford (Optional)
Sunday, July 5 (Evening)	Group Dinner (Optional)
Saturday, July 11 (All Day)	Trip to either Hampton Court or Westminster Abbey or Tower of London (Optional)

Free Time: You can feel free to plan side trips or other activities starting the late afternoon of Thursday July 2 (or Saturday July 4 if you choose to go on the optional Oxford trip) through the evening of Sunday, July 5 and starting the evening of Thursday, July 9 through the evening Sunday, July 12 (if you do not go on the optional trip).

Homework: There will be nightly assignments in this class which must be completed by the next day. These will make up a high percentage of your grade and you should expect to spend several hours a day on them. The solutions must be written up clearly and, whenever possible, in complete sentences.

Paper: You will write a 2-4 page paper on a topic inspired by one of our field trips. The paper could address topics such as: World War II, history of cryptography, modern cryptosystems we did not cover, deciphering ancient scripts or the history of computing. Your assignment is to take something you learned on one of the field trips and investigate it further. You must get approval on your topic from me before you begin work on it to ensure the appropriateness of the topic and to make sure the topics for different students are sufficiently different. The paper needs to be emailed to me by Wednesday, July 22nd.

Exams: There will be two exams in this course: one hour-and-a-half midterm on Wednesday, July 8 (taken the second half of the class) and a comprehensive two-hour final exam on Friday, July 17.

Plagiarism: The work you turn in must be your own. You may work together on the homework assignments but what you turn in must be your own understanding of how to solve the problem. The best way to ensure this is write up your solutions by yourself after you have worked together on the problem. **Copying from another student or another source without proper documentation is a violation of academic integrity and will not be tolerated.**

Grading: Your grade will be determined by the following assignment of points:

Participation in Class	20 Points
Participation in Field Trips	20 Points
Homework	60 Points
Paper	25 Points
Midterm	50 Points
Final	75 Points
Total	**250 Points**

YR MV RX IV RK KZ DV ZE CF EU FE !