



# Computational Social Science major

[www.PoliSci.Pitt.edu/Undergraduate](http://www.PoliSci.Pitt.edu/Undergraduate)

Revised: 10/2021

This major will prepare students to understand, engage with, and innovatively solve evolving, complex multi-scale challenges such as climate change, transnational political violence, cybersecurity, social polarization, and inequality. This major will draw on and enhance Pitt's strength in both social science theory, broadly construed, as well as computer science, informatics, and networked systems. Students will gain an understanding of modern computational tools and resources, and social, political, and economic concepts from core social science classes. This integrated training will empower students to a) enhance scalable computational tools with useful domain knowledge from the social sciences as well as b) extend existing theories related to social challenges using digital data sources and computation on them. The ultimate goal of the computational social science major is to train students to build, compute, and improve theoretically informed models of social processes, bridging domain and technical expertise.

## Required courses for the Computational Social Science major

The Computational Social Science major requires the completion of 52 to 53 credits distributed as follows.

### Mathematics course

MATH 0220 Analytic Geometry and Calculus 1

### Foundations of Computational Social Science courses

#### Introduction to Computational Social Science

PS 0702 Introduction to Computational Social Science

#### Introduction to Social Science

Choose one of the following courses.

PS 0200 American Politics

PS 0300 Comparative Politics

PS 0500 International Relations

#### Introduction to Computational Approaches and Basic Tools

Choose one of the following courses.

CS 0010 Introduction to Computing for Engineers

CS 0011 Introduction to Computing for Scientists

CS 0012 Introduction to Computing for the Humanities

#### Intermediate Computational Approaches

CMPINF 0401 Intermediate Programming

#### Elective in Computational Approaches

Choose one of the following courses.

INFSCI 0410 Human Centered systems

INFSCI 0510 Data Analysis

INFSCI 0610 Networks and Information

INFSCI 1500 Database Management Concepts and Applications

#### Social Science Research Design course

PS 0700 Methods of Political Research

#### Modeling Social Interactions and Motivations course

Choose one of the following courses.

PS 1250 Strategy, Games, and Politics

PS 1514 Political Strategy in International Relations

PS 1710 Formal Political Analysis

### Ethics, Security, and Privacy courses

Choose two of the following courses.

CMPINF 1205 Comparative Digital Privacies

CS 0590 Social Implications of Computing

INFSCI 1600 Security and Privacy

PS 1693 Political theory and the Future

### Intermediate Techniques for Computational Social Science courses

#### Computational Skills courses

Choose two courses from the following list.

INFSCI 1440 Social Computing

INFSCI 1520 Visualization

INFSCI 1530 Data Mining

INFSCI 1550 Spatial Information

INFSCI 1620 Advanced Security and Privacy

#### Two Upper-level Social Science courses

Students will delve deeper into their domain specialization with two classes. One class should be within a domain theme (such as international relations), another substantive class can be outside that theme (such as in comparative politics).

American Politics: PS 1200-level

Comparative Politics: PS 1300-level

International Relations: PS 1500-level

#### Integrated Analytics course

Students must complete one analytics-intensive course in the PS 1290X, PS 1390X, or PS 1590X series, or PS 1702.

#### Application Development Capstone course

Choose one of the following courses.

INFSCI 1700 Data Driven Communication

INFSCI 1710 Directed Research

INFSCI 1730 Independent Study

INFSCI 1740 Team-Based Capstone

PS 1782 Application in Computational Social Science

### Grade requirements

A grade of C or better is required in each course that is to count toward the major. A minimum GPA of 2.0 in departmental courses is required for graduation.

## Satisfactory/No Credit option

No course that counts toward the major can be taken on an S/NC basis without the approval of the advisor.

## Writing (W) requirement

Students must complete at least one W-course in the major. CS 0590 meets this requirement when offered as a writing-intensive course.

## Advising

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## Checklist for the Computational Social Science major

### Mathematics course

\_\_\_\_\_ MATH 0220 Analytic Geometry and Calculus 1

### Foundations of Computational Social Science courses

#### Introduction to Computational Social Science

\_\_\_\_\_ PS 0702 Introduction to Computational Social Science

#### Introduction to Social Science

Choose one of the following courses.

- \_\_\_\_\_ PS 0200 American Politics
- \_\_\_\_\_ PS 0300 Comparative Politics
- \_\_\_\_\_ PS 0500 International Relations

#### Introduction to Computational Approaches and Basic Tools

Choose one of the following courses.

- \_\_\_\_\_ CS 0010 Introduction to Computing for Engineers
- \_\_\_\_\_ CS 0011 Introduction to Computing for Scientists
- \_\_\_\_\_ CS 0012 Introduction to Computing for the Humanities

#### Intermediate Computational Approaches

\_\_\_\_\_ CMPINF 0401 Intermediate Programming

#### Elective in Computational Approaches

Choose one of the following courses.

- \_\_\_\_\_ INFSCI 0410 Human Centered systems
- \_\_\_\_\_ INFSCI 0510 Data Analysis
- \_\_\_\_\_ INFSCI 0610 Networks and Information
- \_\_\_\_\_ INFSCI 1500 Database Management Concepts and Applications

### Social Science Research Design course

\_\_\_\_\_ PS 0700 Methods of Political Research

### Modeling Social Interactions and Motivations course

Choose one of the following courses.

- \_\_\_\_\_ PS 1250 Strategy, Games, and Politics
- \_\_\_\_\_ PS 1514 Political Strategy in International Relations
- \_\_\_\_\_ PS 1710 Formal Political Analysis

### Ethics, Security, and Privacy courses

Choose two of the following courses.

- \_\_\_\_\_ CS 0590 Social Implications of Computing
- \_\_\_\_\_ CMPINF 1205 Comparative Digital Privacies
- \_\_\_\_\_ INFSCI 1600 Security and Privacy
- \_\_\_\_\_ PS 1693 Political theory and the Future

### Intermediate Techniques for Computational Social Science courses

#### Computational Skills courses

Choose two courses from the following list.

- \_\_\_\_\_ INFSCI 1440 Social Computing
- \_\_\_\_\_ INFSCI 1520 Visualization
- \_\_\_\_\_ INFSCI 1530 Data Mining
- \_\_\_\_\_ INFSCI 1550 Spatial Information
- \_\_\_\_\_ INFSCI 1620 Advanced Security and Privacy

#### Two Upper-level Social Science courses

- \_\_\_\_\_ Social Science course aligning with introductory course theme
- \_\_\_\_\_ Social Science course from another theme

#### Themes

American Politics: PS 1200-level  
Comparative Politics: PS 1300-level  
International Relations: PS 1500-level

#### Integrated Analytics course

\_\_\_\_\_ Analytics course

#### Application Development Capstone course

Choose one of the following courses.

- \_\_\_\_\_ PS 1782 Application in Computational Social Science
- \_\_\_\_\_ INFSCI 1700 Data Driven Communication
- \_\_\_\_\_ INFSCI 1710 Directed Research
- \_\_\_\_\_ INFSCI 1730 Independent Study
- \_\_\_\_\_ INFSCI 1740 Team-Based Capstone