INFORMATION SCIENCE (BA)

College of Arts and Sciences

Program Website (https://as.cornell.edu/)

CIP: 11.0103 | **HEGIS:** 0702.00 | **NYSED:** 28116

Program Description

Information Science is fundamentally concerned with the human-centered aspects of computing and information—ranging from how individuals interact with computing devices, to studying people through their social and information network use, and understanding the way computing systems affect our society and culture.

Who Should Major in Information Science?

Students interested in the human-centered aspects of computing and information, such as algorithmic fairness; ethics, law, and policy; computational social science; digital humanities; human-computer and human-robot interaction; interaction and critical design; machine learning; market and mechanism design, natural language processing; network analysis; science and technology studies; and user experience (UX) and design.

Who is Eligible to Major in Information Science?

Students in the College of Agriculture and Life Science (CALS) and the College of Arts and Sciences (A&S). A&S students earn a Bachelor of Arts (BA) in Information Science; students in CALS earn a Bachelor of Science (BS).

- The BA and BS in Information Science share the same requirements and elective course options.
- The differences are in each admitting college's foundational requirements.

Honors

To qualify for departmental honors, students must apply by the end of their seventh semester and meet the GPA requirement of 3.5 or higher at the time of application and maintained through their graduation date. Students intending to pursue honors must complete the following course work in addition to their IS major courses:

- Three additional credit hours of IS coursework at or above the 5000-level (graded courses only; no seminars or 2-credit project courses);
- Six credit hours of INFO 4900 Independent Reading and Research with one or more IS faculty members, spread over at least two semesters (at least 3.0 credits each semester) and with grades of A– or higher. It is expected that the INFO 4900 research will result in a project report.

The 9 credit hours of work for departmental honors cannot be counted towards any other major requirement.

Criteria for Good Standing

Students must meet the following criteria for good standing at the end of each semester:

- Earn an overall GPA of at least 2.3
- Earn a weighted GPA for the IS major of at least 2.5
- Complete all courses with a grade of C- or higher
- Complete at least 12 academic credits per semester
- Complete all core INFO courses prior to the start of the final semester of study (students must pre-enroll in any remaining core coursework by the end of their 3-2 semester)

Declaring the IS Major as a Current A&S Student

Current A&S students looking to affiliate with the IS major, change majors to IS, or add IS as a second major should start taking courses to meet the criteria for admission as outlined below. Contact the IS Advising office to schedule an advising meeting. Once students have met the admission criteria (or final courses needed are in progress), students should apply online (https://affiliations.coecis.cornell.edu/is/).

All potential majors are reviewed on a case-by-case basis relative to the following criteria:

Completion of 4 courses:

1) Introductory Programming: Choose one

Code	Title	Hours
CS 1110	Introduction to Computing: A Design and Development Perspective	4
CS 1112	Introduction to Computing: An Engineering and Science Perspective	4

Note:
Advanced Placement (AP) Computer Science A (score of 5), International Baccalaureate (IB) Computer Science (score of 6 or 7), or a passing Computer Science Advanced Standing Exam (CASE) score may be used to fulfill the programming requirement.

2) Calculus or Statistics: Choose one

Code	Title	Hours
Calculus		
MATH 1106	Modeling with Calculus for the Life Sciences	4
MATH 1110	Calculus I	4
MATH 1910	Calculus for Engineers	4
Statistics		
AEM 2100	Introductory Statistics	4
BTRY 3010	Statistics I (crosslisted)	4
CEE 3040	Uncertainty Analysis in Engineering	4
ECON 3110	Applied Probability and Statistics (crosslisted)	4
ECON 3130	Probability and Statistics	4
ENGRD 2700	Eng Probability and Statistics: Modeling and Data Science	4
ILRST 2100	Introductory Statistics and Data Science (crosslisted)	4
MATH 1710	Statistical Theory and Application in the Real World	4
PUBPOL 2100	Introduction to Statistics	4
PSYCH 2500	Statistics and Research Design	3
SOC 3010	Statistics for Sociological Research	4
STSCI 2100	Introductory Statistics and Data Science (crosslisted)	4
STSCI 2150	Introductory Statistics for Biology	4
STSCI 2200	Statistics I (crosslisted)	4

Note:

- AP Calculus AB (score of 4 or 5), AP Calculus BC (score of 4 or 5), IB Mathematics (AA or AI; score of 6 or 7), General Certificate of Education (GCE) Advanced ("A") Level Mathematics (score of A*, A, B, or C), or a passing Mathematics Department Placement Exam score may be used to fulfill the calculus requirement.
- AP Statistics is not accepted for the IS major.

3) Core Courses: Choose two

Code	Title	Hours
INFO 1200	Information Ethics, Law, and Policy (crosslisted)	3
or INFO 1260	Choices and Consequences in Computing	
INFO 1300	Introductory Design and Programming for the Web	4
INFO 2040	Networks (crosslisted)	3
INFO 2450	Communication and Technology (crosslisted)	3
INFO 2950	Introduction to Data Science [1]	4
or INFO 2951	Introduction to Data Science with R	

[1] Due to an overlap in content, students may only receive academic credit for INFO 2950 or INFO 2951, not both.

Note:

- Students may count CS 2800 + CS 2110 together in place of INFO 2950 for affiliation purposes only. Once admitted to the major, INFO 2950 or INFO 2951 must be completed.
- Students can count INFO 1380 in place of one core course for the purposes of affiliation, only. After affiliation, students will still need to complete all listed core classes.

Grade & GPA Requirement

- A grade of C or higher in each of the completed courses used to declare the major.
- A GPA of 2.5 or higher for courses used to declare the major.

Note

- Courses used for the purpose of declaring the major may be repeated if the original course grade was below a C. The most recent grade will be used for all repeated courses. Qualifying courses must be taken at Cornell.
- Students in their senior year of study intending to change majors to IS or add IS as a second major must submit a course plan to demonstrate they can complete all degree requirements by their current expected graduation date.

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 120

Program Requirements

Majors are required to take core courses that introduce them to the variety of theories and methods of study within the discipline. Students will specialize in a particular area of interest in Information Science by choosing courses from one concentration that will provide in-depth study in that area. Courses under each concentration come from within and outside the department. In addition to the courses in their chosen concentration, students are required to complete three elective classes that will contribute to their studies in either breadth or depth.

- Students must complete the major's five core courses: INFO 1200 or INFO 1260, INFO 1300, INFO 2040, INFO 2450, and INFO 2950 or INFO 2951.
- Students must take Introductory Programming (CS 1110 or CS 1112), one Calculus course, and one Statistics course.
  - AP credit may be used to fulfill the CS 1110 and calculus requirements.
- Students must complete four courses in at least one Concentration from the options listed below.
- Students must complete three electives. See the Elective requirements guidelines.
- Counting courses for more than one requirement within the major is not permitted.
- Minimum number of credits required for the major = 50 credits.
- Students may apply transfer credit towards the introductory programming, calculus, or statistics requirement for the major. Transfer credit must be approved by the appropriate department (e.g., Computer Science for CS 1110 equivalency) and A&S before it can be applied towards the major.
- Students may petition the Director of Undergraduate Studies to count transfer credit or other relevant Cornell courses towards concentration or elective requirements. Transfer credit must be approved by the IS Department and A&S before it can be applied towards the major.
- Up to two courses from a qualified study abroad program may be counted towards the major in one of two ways: (1) one concentration course and one major elective or (2) two major electives. Courses must be approved in advance by the Director of Undergraduate Studies. See the IS Studying Abroad website (https://infosci.cornell.edu/undergraduate/studying-abroad/) for more information.

Grading

All courses in the major must be taken for a letter grade. Affiliated students must earn a C- or higher in all courses used for the major.

Introductory Courses

Core (5 required courses):

Code	Title	Hours
INFO 1200	Information Ethics, Law, and Policy (crosslisted)	3
or INFO 1260	Choices and Consequences in Computing	
INFO 1300	Introductory Design and Programming for the Web	4
INFO 2040	Networks (crosslisted)	3
INFO 2450	Communication and Technology (crosslisted)	3
INFO 2950	Introduction to Data Science [1]	4
or INFO 2951	Introduction to Data Science with R	

[1] Due to an overlap in content, students may only receive academic credit for INFO 2950 or INFO 2951, not both.

Programming and Math Requirements

Programming Courses

- CS 1110 Introduction to Computing: A Design and Development Perspective or

- CS 1112 Introduction to Computing: An Engineering and Science Perspective
- Advanced Placement (AP) Computer Science A (score of 5), International Baccalaureate (IB) Computer Science (score of 6 or 7), or a passing Computer Science Advanced Standing Exam (CASE) score may be used to fulfill the programming requirement.

Note: Students are expected to learn the appropriate programming language(s) for their courses as needed, regardless of the language in which introductory programming was taught. It is assumed that all Information Science majors will have Python programming knowledge.

Math Courses

Choose one:

Code	Title	Hours
MATH 1106	Modeling with Calculus for the Life Sciences	4
MATH 1110	Calculus I	4
MATH 1910	Calculus for Engineers	4

Note:
AP Calculus AB (score of 4 or 5), AP Calculus BC (score of 4 or 5), IB Mathematics (AA or AI; score of 6 or 7), General Certificate of Education (GCE) Advanced ("A") Level Mathematics (score of A*, A, B, or C), or a passing Mathematics Department Placement Exam score may be used to fulfill the calculus requirement.

Statistics Courses

Choose one:

Code	Title	Hours
AEM 2100	Introductory Statistics	4
BTRY 3010	Statistics I (crosslisted)	4
CEE 3040	Uncertainty Analysis in Engineering	4
ECON 3110	Applied Probability and Statistics (crosslisted)	4
ECON 3130	Probability and Statistics	4
ENGRD 2700	Eng Probability and Statistics: Modeling and Data Science	4
ILRST 2100	Introductory Statistics and Data Science (crosslisted)	4
MATH 1710	Statistical Theory and Application in the Real World	4
PUBPOL 2100	Introduction to Statistics	4
PSYCH 2500	Statistics and Research Design	3
SOC 3010	Statistics for Sociological Research	4
STSCI 2100	Introductory Statistics and Data Science (crosslisted)	4
STSCI 2150	Introductory Statistics for Biology	4
STSCI 2200	Statistics I (crosslisted)	4

Note:
AP credit is not accepted for the introductory statistics requirement.

Concentrations

Each of the introductory Information Science courses is the beginning of a path of in-depth study. We call these paths Concentrations. Each one is described in further detail below. Students must complete 4 courses within their chosen concentration.

Select one:

Behavioral Science

This concentration provides students with an in-depth understanding of the behavioral and social aspects of interacting with and through information technology.

A. Understanding Social Behavior: Choose Two Courses

Code	Title	Hours
INFO 4430	Teams and Technology	3
INFO 4450	Computer-Mediated Communication (crosslisted)	3
INFO 4490	Social Behavior and Technology (crosslisted)	3
INFO 4500	Language and Technology (crosslisted)	3
INFO 4505	Computing and Global Development	3
INFO 4940	Special Topics in Information Science [1]	1-4
COMM 4380	Communication in Virtual Worlds	3
PSYCH 3800	Social Cognition	3

[1] Specific topics approved by advisor.

B. Social Data Analytics: Choose One Course

Code	Title	Hours
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3
INFO 3950	Data Analytics for Information Science	3
INFO 4100	Learning Analytics	3
INFO 4300	Language and Information (crosslisted)	3
INFO 4350	Conversations and Information	3
INFO 4940	Special Topics in Information Science [1]	1-4
CS 3780	Introduction to Machine Learning	4
CS 4740	Natural Language Processing (crosslisted)	4

[1] Specific topics approved by advisor.

Choose One Course from Section C

*One course from any of the below "Behavior in Context" sections. You do not need to take one course from each.

Code	Title	Hours
C1. Behavior in Sociological Context		
INFO 3200	Technology, Behavior and Society (crosslisted)	3
INFO 4140	Law, Policy, and Politics of Cybersecurity	3
INFO 4940	Special Topics in Information Science [1]	1-4
C2. Behavior in Network Context		
INFO 4360	Communication Networks and Social Capital (crosslisted)	3
COMM 4940	Special Topics in Communication [1]	1-3
C3: Behavior in Design Context		
INFO 3450	Human-Computer Interaction Design (crosslisted)	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4400	Qualitative User Research and Design Methods (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4

[1] Specific topics approved by advisor.

Data Science

This concentration will equip students to learn about the world through data analytics.

A. Data Analysis: Choose One Course

Code	Title	Hours
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3
INFO 3900	Causal Inference (crosslisted)	3
INFO 3950	Data Analytics for Information Science	3
INFO 4940	Special Topics in Information Science [1]	1-4
CS 3780	Introduction to Machine Learning	4
ORIE 3120	Practical Tools for Operations Research, Machine Learning and Data Science	4
ORIE 3741	Learning with Big Messy Data	4
ORIE 4740	Statistical Data Mining I	4
STSCI 3740	Data Mining and Machine Learning	4

[1] Specific topics approved by advisor.

B. Domain Expertise: Choose One Course

Code	Title	Hours
INFO 2770	Excursions in Computational Sustainability (crosslisted)	3
INFO 3130	Data and the State: How Governments See People and Places	4
INFO 3350	Text Mining History and Literature	3
INFO 3370	Studying Social Inequality Using Data Science	3
INFO 4100	Learning Analytics	3
INFO 4120	Ubiquitous Computing	3
INFO 4300	Language and Information (crosslisted)	3
INFO 4350	Conversations and Information	3
INFO 4940	Special Topics in Information Science [1]	1-4
CS 4740	Natural Language Processing (crosslisted)	4

[1] Specific topics approved by advisor.

C. Big Data Ethics, Policy and Society: Choose One Course

Code	Title	Hours
INFO 3200	Technology, Behavior and Society (crosslisted)	3
INFO 4140	Law, Policy, and Politics of Cybersecurity	3
INFO 4145	Privacy and Security in the Data Economy	3
INFO 4200	Information Policy: Applied Research and Analysis (crosslisted)	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4250	Surveillance and Privacy	3
INFO 4260	Computing On Earth: Planetary Dimensions and Consequence of Computing (crosslisted)	3
INFO 4390	Practical Principles for Designing Fair Algorithms	3
INFO 4561	Evaluation and Society (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4
ENGL 3778	Free Speech, Censorship, and the Age of Global Media (crosslisted)	4
PUBPOL 3460	Culture, Law, and Politics of Information Policy	3

[1] Specific topics approved by advisor.

D. Data Communication: Choose One Course

Code	Title	Hours
INFO 3312	Data Communication	3
INFO 4310	Interactive Information Visualization	3
COMM 3150	Organizational Communication: Theory and Practice	3
COMM 3189	Taking America's Pulse: Creating and Conducting a National Opinion Poll (crosslisted)	3-4
COMM 4860	Risk Communication	3
COMM 4940	Special Topics in Communication [1]	1-3
SOC 3580	Big Data on the Social World	3

[1] Specific topics approved by advisor.

Digital Culture and Production

This concentration explores computing as a cultural phenomenon. It equips students to analyze technology's role in society and culture, understand it historically, and produce media artifacts.

This concentration can be completed by following either of the two options below:

- Option 1. One course each from A, B, and C, and an additional course from C.
- Option 2. Three courses from A and one course from B.

For the Media, Art, Design (C) component: Any ARCH elective course or option studio at the 3000 level or higher that addresses IT as a significant component can work for this portion. Elective courses can be found on the College of Arts, Architecture, and Planning website (https://aap.cornell.edu/academics/architecture/). Please contact the IS Advising office for course approval.

A. Digital Culture and History: Choose One Course

Code	Title	Hours
INFO 2921	Inventing an Information Society (crosslisted)	3
INFO 3200	Technology, Behavior and Society (crosslisted)	3
INFO 4140	Law, Policy, and Politics of Cybersecurity	3
INFO 4260	Computing On Earth: Planetary Dimensions and Consequence of Computing (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4
STS 4040	Digital Due Process Clinic	4

[1] Specific topics approved by advisor.

B. Digital Production: Choose One Course

Code	Title	Hours
INFO 2300	Server-Side Web Development	4
INFO 2310	Interactive Web Development	4
INFO 3152	Introduction to Computer Game Design [1]	4
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3

INFO 4320	Introduction to Rapid Prototyping and Physical Computing	4
CS 4620	Introduction to Computer Graphics	3
CS 4758	Autonomous Mobile Robots (crosslisted)	3

[1] Students must take the INFO version of INFO 3152. CS 3152 does not count towards the major.

C. Media, Art, Design: Students Pursuing Option 1 for This Concentration: Choose One Course

Code	Title	Hours
INFO 3450	Human-Computer Interaction Design (crosslisted)	3
INFO 3660	History and Theory of Digital Art (crosslisted)	3
INFO 4152	Advanced Topics in Computer Game Design [1]	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4400	Qualitative User Research and Design Methods (crosslisted)	3
INFO 4420	Human Computer Interaction Studio	4
INFO 4940	Special Topics in Information Science [2]	1-4
ART 3705	Media Arts, Performance, and Sound: Sound	4
ARTH 4151	Topics in Media Arts (crosslisted)	3
COML 3115	(crosslisted)	3

[1] Students must take the INFO version of INFO 4152. CS 4152 does not count towards the major.

[2] Specific topics approved by advisor.

Information Ethics, Law, and Policy

This concentration provides training and insight into the ethical, legal, and policy dimensions of contemporary information technology.

A. Frameworks and Institutions: Choose One Course

Code	Title	Hours
INFO 4113	Technology and Law Colloquium (crosslisted)	3
INFO 4140	Law, Policy, and Politics of Cybersecurity	3
INFO 4200	Information Policy: Applied Research and Analysis (crosslisted)	3
INFO 4250	Surveillance and Privacy	3
INFO 4301	Ethics in New Media, Technology, and Communication (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4
HADM 4890	The Law of the Internet and E-Commerce	3
PUBPOL 3460	Culture, Law, and Politics of Information Policy	3

[1] Specific topics approved by advisor.

B. Methods and Analysis: Choose One Course

Code	Title	Hours
INFO 2921	Inventing an Information Society (crosslisted)	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4940	Special Topics in Information Science [1]	1-4
PUBPOL 2300	Introduction to Policy Analysis	4
PUBPOL 2301	Introduction to Public Policy	4

[1] Specific topics approved by advisor.

C. Cases/Topics: Choose One Course

Code	Title	Hours
COMM 4940	Special Topics in Communication [1]	1-3
INFO 3200	Technology, Behavior and Society (crosslisted)	3
INFO 4145	Privacy and Security in the Data Economy	3
INFO 4260	Computing On Earth: Planetary Dimensions and Consequence of Computing (crosslisted)	3
INFO 4390	Practical Principles for Designing Fair Algorithms	3
INFO 4561	Evaluation and Society (crosslisted)	3
STS 4040	Digital Due Process Clinic	4

[1] Specific topics approved by advisor.

D. Tools and Technical Domains: Choose One Course

Code	Title	Hours
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3
INFO 3350	Text Mining History and Literature	3
INFO 3370	Studying Social Inequality Using Data Science	3
INFO 4100	Learning Analytics	3
INFO 4120	Ubiquitous Computing	3
INFO 4300	Language and Information (crosslisted)	3
INFO 4350	Conversations and Information	3

Students may petition the Director of Undergraduate Studies to allow an upper-level (3000-level or above) technical IS course relevant to their work in Information Ethics, Law, and Policy to be used to satisfy this requirement.

Interactive Technologies

This concentration provides students with the analytical and technical skills they need to design and build functional technical systems.

Required Course

- CS 2110 Object-Oriented Programming and Data Structures (crosslisted)

A. Building (with Hardware): Choose One Course

Code	Title	Hours
INFO 4120	Ubiquitous Computing	3
INFO 4320	Introduction to Rapid Prototyping and Physical Computing	4
CS 4758	Autonomous Mobile Robots (crosslisted)	3

B. Working with Data/Software: Choose One Course

Code	Title	Hours
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3
INFO 4340	App Design and Prototyping	3
INFO 4555	Business Intelligence Systems	4
CS 3780	Introduction to Machine Learning	4
CS 4620	Introduction to Computer Graphics	3
CS 5150	Software Engineering	4
ORIE 3120	Practical Tools for Operations Research, Machine Learning and Data Science	4
ORIE 4740	Statistical Data Mining I	4

ORIE 3741	Learning with Big Messy Data	4
STSCI 3740	Data Mining and Machine Learning	4

C. Context/Application Domains: Choose One Course

Code	Title	Hours
INFO 4152	Advanced Topics in Computer Game Design	3
INFO 4310	Interactive Information Visualization	3
INFO 4410	Re-Designing Robots (crosslisted)	3
INFO 4430	Teams and Technology	3
INFO 4505	Computing and Global Development	3
INFO 4940	Special Topics in Information Science [1]	1-4

[1] Specific topics approved by advisor.

- Students must take the INFO version of INFO 3152 and INFO 4152. CS 3152 and CS 4152 do not count towards the major.

Networks, Crowds, and Markets

This concentration helps students to understand formal models, data and policy issues surrounding networked systems.

A. Models: Choose Two Courses

Code	Title	Hours
INFO 4220	Networks II: Market Design (crosslisted)	3
INFO 4360	Communication Networks and Social Capital (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4
COMM 3150	Organizational Communication: Theory and Practice	3
ECON 4020	Game Theory I	3
ECON 4610	Industrial Organization I	3
ECON 4660	Behavioral Economics	4
ORIE 4350	Introduction to Game Theory	4
SOC 3080	Social Networks and Power	3

[1] Specific topics approved by advisor.

B. Data: Choose One Course

Code	Title	Hours
INFO 3300	Visual Data Analytics for the Web (crosslisted)	3
INFO 3950	Data Analytics for Information Science	3
INFO 4300	Language and Information (crosslisted)	3
INFO 4350	Conversations and Information	3
INFO 4940	Special Topics in Information Science [1]	1-4
CS 3780	Introduction to Machine Learning	4
CS 4740	Natural Language Processing (crosslisted)	4
ECON 3120	Applied Econometrics	4
ECON 3140	Econometrics	4

[1] Specific topics approved by advisor.

C. Policy/Values: Choose One Course

Code	Title	Hours
INFO 4140	Law, Policy, and Politics of Cybersecurity	3
INFO 4145	Privacy and Security in the Data Economy	3
INFO 4200	Information Policy: Applied Research and Analysis (crosslisted)	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4250	Surveillance and Privacy	3
INFO 4940	Special Topics in Information Science [1]	1-4
COMM 4940	Special Topics in Communication [1]	1-3
PUBPOL 3460	Culture, Law, and Politics of Information Policy	3

[1] Specific topics approved by advisor.

UX (User Experience)

This concentration is designed to help students gain a better understanding of user experience design through studies in design and user perception.

A. Core Principles of Design: Choose One Course

Code	Title	Hours
INFO 3450	Human-Computer Interaction Design (crosslisted)	3
INFO 4410	Re-Designing Robots	3
INFO 4400	Qualitative User Research and Design Methods (crosslisted)	3
INFO 4940	Special Topics in Information Science [1]	1-4

[1] Specific topics approved by advisor.

B. Design in Context: Choose One Course

Code	Title	Hours
INFO 2921	Inventing an Information Society (crosslisted)	3
INFO 4240	Designing Technology for Social Impact (crosslisted)	4
INFO 4420	Human Computer Interaction Studio	4
INFO 4505	Computing and Global Development	3
INFO 4940	Special Topics in Information Science [1]	1-4

[1] Specific topics approved by advisor.

C. Knowing the User: Choose One Course

Code	Title	Hours
INFO 4125	Project Management	3
INFO 4430	Teams and Technology	3
INFO 4450	Computer-Mediated Communication (crosslisted)	3
INFO 4490	Social Behavior and Technology (crosslisted)	3
COMM 4380	Communication in Virtual Worlds	3
PSYCH 3420	Human Perception: Application to Computer Graphics, Art, and Visual Display (crosslisted)	3

D. Knowing the Technology: Choose One Course

Code	Title	Hours
INFO 3152	Introduction to Computer Game Design	4
INFO 4152	Advanced Topics in Computer Game Design	3
INFO 4310	Interactive Information Visualization	3
INFO 4320	Introduction to Rapid Prototyping and Physical Computing	4

INFO 4340	App Design and Prototyping	3
CS 5150	Software Engineering	4

- Students must take the INFO version of INFO 3152 and INFO 4152. CS 3152 and CS 4152 do not count towards the major.

Electives

Majors must also complete three elective courses. Each elective course must be at least 3.0 credits, taken for a letter grade, and completed with a grade of "C-" or higher.

Approved Electives

Code	Title	Hours
INFO 3000-level or higher [1]		
INFO 2300 or INFO 2310	Server-Side Web Development (but not both) Interactive Web Development	4
CS 2110	Object-Oriented Programming and Data Structures	4
CS 3110	Data Structures and Functional Programming	4
CS 3410	Computer System Organization and Programming	4

[1] Except for INFO 4910, INFO 4997, and INFO 4998.

- Please note that students may only apply one semester (3.0 - 4.0 credits) of INFO 4900 Independent Reading and Research toward their elective coursework requirements.

University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (https://registrar.cornell.edu/service-resources/college-registrar-directory/) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Additional Requirements for Undergraduate Students

The University has two requirements for graduation that must be fulfilled by all undergraduate students: the swim requirement, and completion of two physical education courses. For additional information about fulfilling University Graduation Requirements, see the Physical Education website (https://scl.cornell.edu/pe/).

Physical Education

All incoming undergraduate students are required to take two credits (two courses) of Physical Education prior to graduation. It is recommended they complete the two courses during their first year at Cornell. Credit in Physical Education may be earned by participating in courses offered by the Department of Athletics and Physical Education (https://courses.cornell.edu/preview_program.php?catoid=60&poid=30232) and Cornell Outdoor Education, by being a registered participant on a varsity athletic team, or performing in the marching band.

Students with medical concerns should contact the Office of Student Disability Services (http://sds.cornell.edu/).

Swim Requirement

The Faculty Advisory Committee on Athletics and Physical Education has established a basic swimming and water safety competency requirement for all undergraduate students. Normally, the requirement is taken during the Fall Orientation process at Helen Newman Hall or Teagle Hall pools. The requirement consists of the following: jump or step feet-first into the deep end of the pool, float or tread for one minute, turn around in a full circle, swim 25 yards using any stroke(s) of choice without touching the bottom or holding on to the sides (there is no time limit) and exit from the water. Students who do not complete the swim requirement during their first year, during a PE swim class or during orientation subsequent years, will have to pay a $100 fee. Any student who cannot meet this requirement must register for PE 1100 Beginning Swimming as their physical education course before electives can be chosen.

If a student does not pass the swim requirement in their first Beginning Swimming PE class, then the student must take a second Beginning Swimming PE class (PE 1100 or PE 1101). Successful completion of two Beginning Swimming classes (based on attendance requirements) with the instructor's recommendation will fulfill the University's swim requirement.

Students unable to meet the swim requirement because of medical reasons should contact the Office of Student Disability Services (http://sds.cornell.edu/). When a waiver is granted by the Faculty Committee on Physical Education, an alternate requirement is imposed. The alternate requirement substitute is set by the Director of Physical Education.

College of Arts and Sciences Graduation Requirements

Undergraduate Degrees

Graduation Requirements for the Bachelor of Arts Degree

Credit Requirement: 120 academic credits are required, 100 of which must be taken in the College of Arts & Sciences. 100 credits in Arts & Sciences is a minimum number, as is the 120 credit total. A minimum of 80 credits must be in courses for which a letter grade was received. AP, IB, CASE and A-Level credits count toward the 120 total credits but not toward the 100 A&S credits. Transfer credits for non-transfer students cannot count towards the 100 A&S credits. (See list of courses (https://

as.cornell.edu/registrar/courses-that-dont-count/) that do not count as academic credit.)

Residency Requirement: eight full-time semesters in residence (in person) are expected to complete degree requirements with a minimum of six full-time semesters being required. External transfer students must complete a minimum of four full-time residence semesters.

First-year Writing Seminar (FWS) Requirement: two courses are required. A 5 on either the AP English Composition or Literature exam, or a 7 on the IB HL English Literature or Language exam will count towards one of these seminars. First-year students should take an FWS during their first semester at Cornell and are required to complete two by the end of their sophomore year.

Foreign Language Requirement: a student must either pass an intermediate Cornell language course at the 2000-level or above (Option 1) or complete at least 11 credits in a single foreign language at Cornell (Option 2). AP and IB credits cannot complete this requirement, but usually indicate that a student can place into a higher level course. Note: Native speakers of a foreign language may be exempted from this requirement. For a list of language offerings and placement, see Language Study at Cornell.

Distribution Requirement: Must take a minimum of 8 courses of at least 3 credits to fulfill 10 distribution categories. How an individual course is categorized is indicated with the appropriate abbreviation in its course description. It is important to recognize that only courses with the proper designation in the catalog can be used toward fulfilling the distribution requirements in Arts and Sciences. Unless otherwise specified, variable credit courses, including independent study courses, may not be used for distribution credit.

Arts & Sciences Distribution Requirement Categories:

- Arts, Literature, and Culture (ALC-AS)
- Biological Sciences (BIO-AS)
- Ethics and the Mind (ETM-AS)
- Global Citizenship (GLC-AS)
- Historical Analysis (HST-AS)
- Physical Sciences (PHS-AS)
- Social Difference (SCD-AS)
- Social Sciences (SSC-AS)
- Statistics and Data Science (SDS-AS)
- Symbolic and Mathematical Reasoning (SMR-AS)

Distribution Requirement Definitions

Arts, Literature, and Culture (ALC-AS)
Courses in this area examine arts, literature, and culture in various contexts. Students gain insights into the interplay of individual or collaborative creativity and social practice, and understand the complexities of the expression of the human condition. Topics include the analysis of artworks and literary texts, and the belief systems of social groups, cultures, and civilizations; they also focus on artistic expression itself (in creative writing, performing arts, and media such as film and video).

Biological Sciences (BIO-AS)
Courses in this area focus on understanding a wide range of life forms, from single cells to plants, animals, and their ecosystems. Topics include the molecular and biochemical makeup of life, the sub-cellular, cellular and organismal structures of life, and the evolutionary relatedness of all life forms. Students learn to describe how organisms are connected to each other and to their physical environment. Many courses address how genetic information is expressed from DNA, and how this expression leads to complex function and behavior.

Ethics and the Mind (ETM-AS)
Courses in this area investigate the human mind and its capacities, ranging from cognitive faculties shared by humans and animals such as perception, to language and abstract reasoning, to the ability to form and justify ethical values. Courses investigating the mind may use the methodologies of psychology, linguistics, or philosophy. Those focusing on ethics explore ways of reflecting on questions that concern the nature of justice, the good life, or human values in general. Many courses combine these topics and methodologies.

Global Citizenship (GLC-AS)
Courses in this area examine the history, culture, politics, religion, and social relations of peoples in different parts of the world, as well as their interactions. They encourage students to think broadly about the global community and their place within it, beyond the boundaries of their particular national or cultural group, and cultivate skills of intercultural engagement that are vital to their role as global citizens. These courses introduce students to global challenges such as war and peace, social and economic inequalities, international migration, and environmental sustainability, and encourage students to think critically about international responses to these challenges.

Historical Analysis (HST-AS)
Courses in this area train students in the analysis of documentary, material, and oral evidence about social phenomena, institutions, events and ideas of the past. Students learn to evaluate and critically assess differing analyses and interpretations of former times so that they may acquire a better understanding of the origins and evolution of the present. Questions addressed in HA courses include why and under what circumstances changes have occurred in how people have interacted with one another and with the environments in which they live.

Physical Sciences (PHS-AS)
Courses satisfying this requirement provide an appreciation of how science generates and categorizes enduring knowledge of our physical world. This includes the physics, chemistry, and technology involved, of everything from light to atoms, DNA molecules, Earth science, our Solar system, and to the Cosmos. These courses expose students to both the process and some of the substance of science. By learning the universal aspects of scientific enquiry, students will be better equipped to form opinions on scientific issues that affect the world.

Social Difference (SCD-AS)
Courses in this area examine social differences relevant to the human experience. Social categories include class, race, ethnicity, indigeneity, nationality, language, religion, gender, sexuality, and ability as objects of study. Students develop a deeper understanding of these categories and their intersections. Topics may include: how hierarchies in power and status shape social differences; how social, economic and political systems can impact the interpretation of social differences; and how differences attributed to various groups are explained.

Social Sciences (SSC-AS)
Courses in this area examine social, economic, political, psychological, demographic, linguistic, and relational processes. Topics include understanding how different social contexts, for example neighborhoods, families, markets, networks, or political organizations, shape social life. Students learn to identify, describe, and explain the causes and consequences of social phenomena using quantitative and/or qualitative

evidence based on systematic observation of the social world. They also learn to link evidence to theory through rigorous and transparent reasoning, and/or reflect critically on the concepts through which people make sense of the social world.

Statistics and Data Science (SDS-AS)
Courses in this area develop data literacy, essential to be an informed citizen in today's world. Students learn and apply statistical and computational techniques to effectively collect, visualize, analyze and interpret data, and present conclusions. Applications span a wide variety of contexts: providing a better understanding of the communities in which we live, guiding and enriching our lives, and driving forward scientific inquiry. Students gain an appreciation of how to ask the right questions, and how statistics can depend on the context, assumptions, and limitations of data.

Symbolic and Mathematical Reasoning (SMR-AS)
Courses satisfying this requirement help students develop the skills to solve problems through understanding abstract, logical relationships. Such skills include mathematical analysis of patterns and phenomena, modeling natural and technological systems, and creating algorithms essential to computation. These courses explore specific quantitative and symbolic methods, strategies for applying logical reasoning in diverse areas, and the intrinsic elegance of mathematics.

Major Requirement: students must complete the requirements for at least one major in A&S. See individual major listings for major requirements.

Physical Education Requirement: completion of the university requirement of two PE courses and passing the swim test. Note: physical education credit is not academic credit and does not count toward the 120 credits needed to graduate.

Policies on Applying Cornell and Non-Cornell Courses and Credits to Distribution Requirements

Restrictions on Applying AP/Test Credit and Courses from Other Institutions to the Distribution Requirements

- Students may not apply AP/test credit or transfer credit from another institution to the distribution requirements.
- Students who transfer to the college from another institution are under the above rules for advanced placement credit, but are eligible to have credit for post–high school course work taken during regular full-time semesters (not summer terms) at their previous institution count toward all distribution requirements. Transfer students receive a detailed credit evaluation when they are accepted for admission.

Restrictions on Applying Cornell Courses to the Distribution Requirements

- First-year writing seminars and ENGL 2880 Expository Writing or ENGL 2890 taken to satisfy a first-year writing seminar requirement may not count toward any other college or major requirement.
- Only courses with the proper designation in the Courses of Study can be used toward fulfilling the distribution requirements in Arts and Sciences.
- Students may not petition to change the category of any given course, nor may any faculty member change the category of a course for an individual student. Faculty members wishing to change the category for a course in which they are the primary instructor must petition the Educational Policy Committee for a change in category. If granted, the new category must be applied to the course as a whole and not for an individual student.

Courses That May Fulfill More Than One Requirement

- A course may fulfill more than one college requirement in any of the following situations:
- A course may be used to fulfill distribution and a major requirement (except if prohibited by one of the restrictions noted on applying AP/test credit, transfer credit, and Cornell courses to distribution requirements).
- A course may satisfy a maximum of two distribution categories. Students can only double-count distribution requirements on a maximum of two courses.
- A one-semester course in foreign literature (not language) or culture that is acceptable for certifying option 1 in that language may also be applied to the relevant distribution requirement.
- Courses may count toward any other requirement except first-year writing seminars.

Credit Requirement

Credits and Courses: Students must earn a minimum of 120 academic credits (which may include AP/test credits). Of the 120, a minimum of 100 must be from courses taken in the College of Arts and Sciences at Cornell.

Courses that do not count toward the 120 credits required for the degree. The College of Arts and Sciences does not grant credit toward the degree for every course offered by the university. Courses in military training, service as a teaching assistant, physical education, remedial or developmental training, precalculus mathematics, supplemental science and mathematics, offered by the Learning Strategies Center, and English as a second language are among those for which degree credit is not awarded. Students can view the list of courses that do not count for academic credit here (https://as.cornell.edu/registrar/courses-that-dont-count/).

Other cases in which a course may not receive credit include the following:

- A course identified as a prerequisite for a subsequent course may not be taken for credit once a student completes that subsequent course.
- A repeated course. (For more information, see "Repeating courses," below.)
- A "forbidden overlap," that is, a course with material that significantly overlaps with material in a course a student has already taken. Students should consult the list of Forbidden Overlaps for more information.

Courses that count toward the 100 required Arts and Sciences credits may include liberal arts courses approved for study abroad during a semester or academic year of full-time study (not summer abroad study), courses taken in certain off-campus Cornell residential programs, and a maximum of three courses that majors may accept from other colleges at Cornell as fulfilling major requirements. A&S courses taken in Cornell's summer session may count towards the 100 A&S credits.

Courses that do not count toward the 100 required Arts and Sciences credits include credits earned in other colleges at Cornell (except in the cases specifically noted in this section), transfer credits earned in any subject at institutions other than Cornell, and advanced placement/test credits. AP/test credits count as part of the 120 credits required for the

degree but not as part of the 100 Arts and Sciences credits and may not be applied to distribution requirements. AP credits are posted on the transcript. If, subsequently, a student takes the course out of which they had placed, the AP credit will be removed because of the overlap in content.

Repeating Courses

Students occasionally need to repeat courses. Some courses, such as independent study, some music and performance courses, and specific topical seminars, in which content is significantly different, do grant credit when the course is taken more than once. For all repeated courses, both grades appear on the transcript and are included in both the term and cumulative GPA. For repeated courses that do not grant credit more than once, only one instance counts toward degree credits and requirements.

Residency Requirement

The College of Arts & Sciences is a residential community and students typically spend eight semesters of full-time study in residence to earn the B.A. degree.

The completion of a fall or spring term as a full-time registered student at Cornell counts as a semester in residence. Summer and winter terms at Cornell, study in Cornell's School of Continuing Education and at other institutions do not count as semesters of residence.

The residency requirement has two components: a minimum number of semesters in residence and a requirement to spend the last full-time semester of study in residence.

Students matriculating into the College of Arts & Sciences as first-year students must have a minimum of six semesters in residence before graduating. First-year matriculants into A&S can count up to two semesters in an approved off-campus program as semesters in residence. Approved off-campus programs include A&S approved study abroad programs, Cornell in Washington, Cornell in Rome, and the Cornell-China & Asia-Pacific Studies (CAPS) Program.

Students who transfer into the College of Arts & Sciences after matriculating in their first-year in another Cornell college (internal transfers) must have a minimum of six semesters in residence, and a minimum of two semesters in the College of Arts and Sciences before graduating. Internal transfers can count up to two semesters in an approved off-campus program as semesters in residence.

Students who transfer into Cornell from another institution (external transfers) must have a minimum of four semesters in residence, and a minimum of two semesters in the College of Arts & Sciences, before graduating. External transfers can count up to one semester in an approved off-campus program as a semester in residence.

In addition to the minimum number of semesters in residence, all students must complete their final full-time semester of study (i.e., the last semester in which at least 9 academic credits are needed to meet graduation requirements) in residence. Students who have fewer than 9 credits to complete degree requirements, and have met the minimum number of semesters residency requirement, may elect to complete their degree requirements during Cornell summer and winter terms registered as an A&S student or at another institution with approved transfer credit. Students cannot meet final degree requirements registered as an extramural student at Cornell.

Exceptions to the residence requirement are not petitionable.

Foreign Language Requirement

The faculty considers competence in a foreign language essential for an educated person. Studying a language other than one's own helps students understand the dynamics of language, our fundamental intellectual tool, and enables students to understand another culture. The sooner a student acquires this competence, the sooner it will be useful. Hence, work toward the foreign language requirement should be undertaken in the first two years. Students postponing the language requirement for junior and senior years risk not graduating on time. Courses in foreign languages and/or literature are taught in the College of Arts and Sciences by the following departments: Africana Studies and Research Center, Asian Studies, Classics, Comparative Literature, German Studies, Linguistics, Near Eastern Studies, and Romance Studies. For a list of languages and placement see Language Study at Cornell.

The language requirement may be satisfied in one of the following ways:

Option 1 (FLOPI): Passing (a) a non-introductory foreign language course of 3 or more credits at Cornell at the 2000-level or above or (b) any other non-introductory course at the 2000-level or above conducted in a foreign language at Cornell. OR

Option 2: Passing at least 11 credits of study in a single foreign language (taken in the appropriate sequence) at Cornell.

Any exceptions to these rules will be noted elsewhere in individual department descriptions.

Students whose speaking, reading, and writing competence in a language other than English is at the same level we would expect our entering first-year students to have in English (as shown by completing high school in that language or by special examination during their first year here at Cornell) are exempt from the college's language requirement.

Major Requirement

Most departments and programs specify certain prerequisites for admission to the major; they are found on the pages for each department and program available at Degree Programs.

Students may apply for acceptance into the major as soon as they have completed the prerequisites and are confident of their choice. This may be as early as the second semester of their first year, and must be no later than the end of the second semester of sophomore year. A student without a major at the beginning of the junior year is not making satisfactory progress toward the degree and risks not being allowed to continue in the college. Undeclared first-term juniors must file a Late Declaration of Major form with Student Services and may be placed on a leave of absence during their junior year if they have not yet declared a major.

Double Majors

Completion of one major is required for graduation. Some students choose to complete more than one major. No special permission or procedure is required; students simply become accepted into multiple majors and are assigned to an advisor in each department. All completed majors are posted on the official transcript. Students are not allowed to continue their studies past their eighth semester to complete additional majors.

Early and Delayed Graduation

Graduating Early

A student may elect to graduate early if they are able to complete all graduation requirements in fewer than eight semesters.

Students must still satisfy the college's residency requirement as part of the graduation requirements. This residency requirement requires that students who are first-year matriculants into Cornell spend a minimum of six semesters in residence, external transfers must spend a minimum of four. To request an early graduation, students must notify the A&S Registrar's Office in KG 17 Klarman Hall or at as-studentservices@cornell.edu (as-studentservices@cornell.edu?subject=Early%20Graduation%20Request).

The earliest a student can request to graduate early and officially change their graduation date is immediately following the pre-enrollment period for their anticipated final semester. The student should have pre-enrolled in the classes required to meet the graduation requirements by the requested graduation date. The student must then complete Part I in DUST and have Part II completed by their major advisor.

Graduating Late: Ninth Term Enrollment

The Bachelor of Arts degree is expected to be completed in eight terms. If degree requirements cannot be completed in eight terms, students may seek permission to continue their studies. Requests will only be granted for students who have found themselves in emergent circumstances beyond their control which have prevented them from completing the degree in eight terms. Requests cannot be made until a student's final expected graduation term and will not be reviewed and approved until after the university drop deadline for that semester. Study beyond the eighth term is not automatically granted for the purposes of changing a major. Such requests must be discussed with a college academic advisor and require registrar approval. Requests to add an additional major or minor will not be approved for study beyond the eighth term.

If approved, students in the ninth and tenth term will be on a conditional status and will have restrictions placed on their enrollment to ensure successful completion of their degree. To request a ninth term, students must have their faculty advisor update Part II for any remaining major requirements. They will also need to submit a study plan to their college advisor listing the specific courses that will meet degree requirements for one major.

Student may elect to prorate credits if enrolling in 9 or fewer credits or take a full-time load if they desire. However, enrollment will be limited to 18 credits for the term so students can focus on their remaining required courses. In the rare case where a student may need to enroll in a tenth term to complete their degree, they will be required to prorate tuition and their enrollment will be limited to only the courses/credits needed for successful completion of one major. Additional enrollments will not be allowed.

Graduation Procedures

Application to Graduate

In the first semester of their senior year, students are prompted by Arts & Sciences Student Services to complete an online application to graduate. The application is intended to help seniors identify problems early enough in the final year to make any necessary changes in course selection to satisfy those requirements. Nonetheless, ensuring graduation requirements are fully met is the student's responsibility and any problems that are discovered, even late in the final semester, must be resolved by the student before the degree can be granted. Students are responsible for checking their DUST (https://data.arts.cornell.edu/as-stus/degree_reqts.cfm) reports and transcripts each term and alerting Student Services of any problems with their academic record. To check on their progress in the major, students should consult with their major advisors.

Degree Dates

Cornell has three official degree conferral dates in the year: December, May, and August. Students who plan to graduate in August may attend commencement ceremonies in the preceding or subsequent May. Students graduating in December are invited to a special recognition ceremony in December and may also attend Commencement the following May. All academic work must be complete by the official conferral date in order to receive a degree on that date. Incomplete academic work will result in a later conferral date.

Honors

Notice: beginning with the December 2026 conferral date, Cornell University will institute a standardized Latin Honors system based solely on final cumulative undergraduate GPA. The Latin Honors categories include: Summa Cum Laude (top 5%), Magna Cum Laude (next 10%), and Cum Laude (next 15%).

The student's cumulative undergraduate GPA percentile at the time of degree conferral will be computed with respect to the student's particular college. Existing college-specific Latin Honors systems not based upon the new standardized criteria will be discontinued at the end of Summer 2026. This will apply to all major honors in Arts & Sciences as they will no longer use Latin Honors and will award "Honors in X" (e.g. Honors in Chemistry, Honors in English, etc.) Please see Graduation and Academic Honors for more information.

Bachelor of Arts with Honors

Almost all departments offer honors programs for students who have demonstrated exceptional accomplishment in the major and succeeded in research. The conferring of honors, and the requirements for conferral (cum laude, magna cum laude, or summa cum laude) are set by the departments for each major, the Independent Major Program, or the College Scholar Program. Minors do not offer honors programs. Students should contact the Director of Undergraduate Studies (https://as.cornell.edu/about/directors-undergraduate-study/) with questions about honors in the respective program.

Bachelor of Arts with Distinction

The degree of Bachelor of Arts with distinction in all subjects will be conferred on students who have completed the requirements for the degree of Bachelor of Arts, if they have met the following requirements by the end of their final semester:

1. completed at least 60 credits while registered in regular sessions at Cornell;
2. achieved a GPA in the upper 30 percent of their class at the end of the seventh semester, or next-to-last semester for transfers and accelerants;
3. received a grade below C– in no more than one course;
4. received no failing grade (excluding PE);
5. have no frozen Incompletes on their records; and
6. maintained good academic standing, including completing a full schedule of at least 12 academic credits, in each of their last four semesters. (Students who have been approved to have prorated tuition for their final semester are considered to be in good academic standing).