CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS, BS

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext) section of the *Guide*.

General Education	• Breadth—Humanities/Literature/Arts: 6 credits • Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits • Breadth—Social Studies: 3 credits • Communication Part A & Part B * • Ethnic Studies * • Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF SCIENCE (BS)

Students pursuing a Bachelor of Science degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either the Bachelor of Arts or the Bachelor of Science degree requirements.

BACHELOR OF SCIENCE DEGREE REQUIREMENTS

Mathematics	Complete two courses of 3+ credits at the Intermediate or Advanced level in MATH, COMP SCI, or STAT subjects. A maximum of one course in each of COMP SCI and STAT subjects counts toward this requirement.
Language	Complete the third unit of a language other than English.
L&S Breadth	Complete: • 12 credits of Humanities, which must include at least 6 credits of Literature; and • 12 credits of Social Science; and • 12 credits of Natural Science, which must include 6 credits of Biological Science and 6 credits of Physical Science.
Liberal Arts and Science Coursework	Complete at least 108 credits.
Depth of Intermediate/Advanced Coursework	Complete at least 60 credits at the Intermediate or Advanced level.
Major	Declare and complete at least one major.
Total Credits	Complete at least 120 credits.
UW-Madison Experience	Complete both: • 30 credits in residence, overall, and • 30 credits in residence after the 86th credit.
Quality of Work	• 2.000 in all coursework at UW–Madison • 2.000 in Intermediate/Advanced level coursework at UW–Madison

NON–L&S STUDENTS PURSUING AN L&S MAJOR

Non–L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

REQUIREMENTS FOR THE MAJOR

BREADTH

3 courses, 1 each from these areas:

Code	Title	Credits
Human Geography (1 course)		**3**
GEOG 101	Introduction to Human Geography	
GEOG 104	Introduction to Human Geography	
GEOG/ART HIST/ ENVIR ST/ HISTORY/ LAND ARC 239	Making the American Landscape	
GEOG 300	Weird Geographies	
GEOG 301	Revolutions and Social Change	
GEOG 302	Economic Geography: Locational Behavior	
GEOG/ URB R PL 305	Introduction to the City	
GEOG 307	International Migration, Health, and Human Rights	
GEOG/CHICLA/ GEN&WS 308	Latinx Feminisms: Women's Lives, Work, and Activism	
GEOG/ INTL ST 311	The Global Game: Soccer, Politics, and Identity	
GEOG/ INTL ST 315	Universal Basic Income: The Politics Behind a Global Movement	

GEOG 318	Introduction to Geopolitics
GEOG 340	World Regions in Global Context
GEOG 342	Geography of Wisconsin
GEOG 355	Africa, South of the Sahara
GEOG 358	Human Geography of Southeast Asia
GEOG/ AMER IND 410	Critical Indigenous Ecological Knowledges
GEOG 501	Space and Place: A Geography of Experience
GEOG/ URB R PL 503	Researching the City: Qualitative Strategies
GEOG/ GEN&WS 504	Feminist Geography: Theoretical Approaches
GEOG/ URB R PL 505	Urban Spatial Patterns and Theories
GEOG 507	Waste Geographies: Politics, People, and Infrastructures
GEOG 510	Economic Geography
GEOG 511	Critical Social Theory
GEOG/ GEN&WS 514	Feminist Geography: Methodological Approaches
GEOG 518	Power, Place, Identity
GEOG 566	History of Geographic Thought
People-Environment (1 course)	**3**
GEOG/ ENVIR ST 139	Global Environmental Issues
GEOG/ART HIST/ ENVIR ST/ HISTORY/ LAND ARC 239	Making the American Landscape
GEOG/ ENVIR ST 309	People, Land and Food: Comparative Study of Agriculture Systems
GEOG/ ATM OCN/ ENVIR ST 332	Global Warming: Science and Impacts
GEOG/ ENVIR ST 333	Green Urbanism
GEOG/ ENVIR ST 337	Nature, Power and Society
GEOG/ BOTANY 338	Environmental Biogeography
GEOG/ ENVIR ST 339	Environmental Conservation
GEOG 340	World Regions in Global Context
GEOG 344	Changing Landscapes of the American West
GEOG/ AMER IND/ ENVIR ST 345	Caring for Nature in Native North America
GEOG 359	Australia: Environment and Society
GEOG/ AMER IND 410	Critical Indigenous Ecological Knowledges
GEOG/C&E SOC/ ENVIR ST 434	People, Wildlife and Landscapes
GEOG/ ENVIR ST 439	US Environmental Policy and Regulation
GEOG/ENVIR ST/ HISTORY 460	American Environmental History
GEOG/ SOIL SCI 526	Human Transformations of Earth Surface Processes
GEOG/ ENVIR ST 534	Environmental Governance: Markets, States and Nature
GEOG/ ENVIR ST 537	Culture and Environment
GEOG 538	The Humid Tropics: Ecology, Subsistence, and Development
GEOG/ ENVIR ST 557	Development and Environment in Southeast Asia
Physical Geography (1 course)	**3**
GEOG/ ENVIR ST 120	Introduction to the Earth System
GEOG/ ENVIR ST 127	Physical Systems of the Environment
GEOG/ GEOSCI 320	Geomorphology
GEOG/ ATM OCN/ ENVIR ST 322	Polar Regions and Their Importance in the Global Environment
GEOG 329	
GEOG/ ATM OCN/ ENVIR ST 332	Global Warming: Science and Impacts
GEOG/ ATM OCN/ ENVIR ST/ GEOSCI 335	Climatic Environments of the Past
GEOG/ BOTANY 338	Environmental Biogeography
GEOG 342	Geography of Wisconsin
GEOG 344	Changing Landscapes of the American West
GEOG/ GEOSCI 420	Glacial and Pleistocene Geology
GEOG 523	Advanced Paleoecology: Species Responses to Past Environmental Change
GEOG/ SOIL SCI 525	Soil Geomorphology
GEOG/ SOIL SCI 526	Human Transformations of Earth Surface Processes
Total Credits	**9**

SKILLS, TECHNIQUES & METHODOLOGY

Code	Title	Credits
Core Cartography/GIS		
GEOG 370	Introduction to Cartography	4
GEOG/ENVIR ST/ F&W ECOL/ G L E/GEOSCI/ LAND ARC 371	Introduction to Environmental Remote Sensing	3

or GEOG 379	Geospatial Technologies: Drones, Sensors, and Applications	
GEOG/CIV ENGR/ ENVIR ST 377	An Introduction to Geographic Information Systems	4
GEOG 378	Introduction to Geocomputing	4
Quantitative Methods (1 course)		**3-4**
GEOG 560	Advanced Quantitative Methods	
STAT 301	Introduction to Statistical Methods	
STAT 324	Introductory Applied Statistics for Engineers	
STAT 371	Introductory Applied Statistics for the Life Sciences	
Mathematics Proficiency		**6**
Complete one of the following by Placement or by completing the course		
MATH 112 & MATH 113	Algebra and Trigonometry	
MATH 114	Algebra and Trigonometry	
Total Credits		**24-25**

DEPTH

Code	Title	Credits
Two courses		**7-8**
GEOG/ENVIR ST/ LAND ARC/ URB R PL 532	Applications of Geographic Information Systems in Planning	
GEOG 572	Graphic Design in Cartography	
GEOG 573	Advanced Geocomputing and Geospatial Big Data Analytics	
GEOG 574	Geospatial Database Design and Development	
GEOG 575	Interactive Cartography & Geovisualization	
GEOG 576	Geospatial Web and Mobile Programming	
GEOG 578	GIS Applications	
GEOG 579	GIS and Spatial Analysis	
Total Credits		**7-8**

CAPSTONE

Code	Title	Credits
Complete one of:		**3-6**
GEOG 565	Colloquium for Undergraduate Majors	
GEOG 681 & GEOG 682	Senior Honors Thesis and Senior Honors Thesis	
GEOG 691 & GEOG 692	Senior Thesis and Senior Thesis	
Total Credits		**3-6**

RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in GEOG and major courses
- 2.000 GPA on 15 upper-level credits, taken in residence [2]
- 15 credits in GEOG, taken on the UW–Madison campus

[2] GEOG courses designated Intermediate/Advanced are upper level in this major.

HONORS IN THE MAJOR

Students may declare Honors in the Cartography and GIS Major in consultation with the Geography undergraduate advisor.

HONORS IN THE CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS MAJOR REQUIREMENTS

To earn Honors in the Major in Cartography and Geographic Information Systems, students must satisfy both the requirements for the major (above) and the following additional requirements:

- Earn a 3.300 overall university GPA
- Earn a 3.300 GPA for all GEOG courses, and all courses accepted in the major
- Complete GEOG 578: GIS Applications with a grade of B or better
- Complete at least one advanced-level course OR 6 credits of honors credits in the major at the 300 level or above
- Complete a two-semester Senior Honors Thesis in GEOG 681 Senior Honors Thesis and GEOG 682 Senior Honors Thesis, a piece of original research composition, for a total of 6 credits.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree	To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency	Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. “In residence” credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.
Quality of Work	Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.