# GEOSPATIAL ANALYSIS AND TECHNOLOGY, COMPREHENSIVE MAJOR 

Liberal Arts (Code 141-001)

## University Requirements

| GRADUATION REQUIREMENTS FOR BACCALAUREATE |  |
| :--- | ---: |
| DEGREE |  |
| Credit Requirements |  |
| Minimum total for graduation |  |
| Upper division credits (courses numbered 300 and higher) | 120 |
| Liberal Education Core (http://catalog.uwec.edu/ | 39 | undergraduate/graduation-requirements/\#header1)

Academic Concentrations (http://catalog.uwec.edu/ undergraduate/graduation-requirements/\#header16)
Grade Point Requirements (http://catalog.uwec.edu/ undergraduate/graduation-requirements/\#header14) ${ }^{2}$

| Total | 2.00 average |
| :--- | ---: |
| Resident | 2.00 average |
| Major | 2.00 average |
| Minor | 2.00 average |
| Certificate | 2.00 average |
| University Residency Requirements (http://catalog.uwec.edu/ |  |
| undergraduate/graduation-requirements/\#header15) | 30 |
| Minimum total | 23 |
| Senior year | 12 |
| Major, Standard, upper division in residence | 21 |
| Major, Comprehensive, upper division in residence |  |
| ertifa |  |

Certificate 25 percent of credits

## Procedures Required for Graduation

Obtain admission to the degree program and/or the College offering it.
Apply for graduation on CampS.
1 Certain programs exceed this minimum.
2 See special requirements in each College.

## Applicability of Credits Toward Graduation

Junior College or Two-Year College Credits. A maximum of 72 semester credits earned in a junior college or two-year college will be accepted as degree credits at UW-Eau Claire.

Extension Credits. Credits earned in credit outreach courses offered by UWEau Claire are treated as resident credits. Credits earned in extension courses offered by other units of the University of Wisconsin System are treated as transfer credits. All other (non-UW) extension and correspondence credits are normally limited to one-fourth of the total required for graduation from any curriculum.

WTCS Credits. A maximum of 72 semester credits earned in college parallel programs at Madison Area Technical College, Milwaukee Area Technical College, Nicolet Area Technical College, or Chippewa Valley Technical

College may be accepted as degree credits at UW-Eau Claire. A set number of general education courses will be accepted from other technical schools. Occupational and technical courses may also be considered for transfer if the quality and content of the course work from the technical college is judged to be comparable to course work at UW-Eau Claire. Refer to the Transfer Credit Wizard (https://my.uwec.edu/psp/PUBLIC/EMPLOYEE/HRMS/c/ EAU_SS_CUSTOM.EAU_TRNCRDWZ.GBL) or contact the UW-Eau Claire Admissions Office for information about the current transfer policy.

USAFI Credit. UW-Eau Claire will accept up to 32 semester credits for work done through the United States Armed Forces Institute, under the provision for non-UW correspondence credit (see Extension Credits above).

Activity Credit (band, chorus, drama, KINS 100-184 courses) Students may count toward graduation no more than one credit of KINS 110-184 courses. Students may count toward graduation no more than four credits earned in any single activity course and no more than 12 credits resulting from any combination of activity courses (excluding KINS 110-184 courses).

Other Restricted Credits. For other University restrictions, see the following: Cooperative Education; Credit by Examination; Satisfactory/Unsatisfactory Registration; Transfer of Credits. College or departmental restrictions may also be placed on Independent Study (399-499 courses), Directed Study (395-495), and other types of credits.

| APPLICABILITY OF CREDITS TOWARD GRADUATION | Credit |
| :---: | :---: |
| Satisfactory/Unsatisfactory |  |
| Total degree credit | maximum 12 |
| Major, Standard | maximum 1 course |
| Major, Comprehensive | maximum 2 courses |
| Minor | maximum 1 course |
| Credit by Examination |  |
| Total degree credit | maximum $1 / 4$ of total |
| Major or minor | maximum $1 / 2$ of total |
| Two-Year College Credits |  |
| Total degree credit | maximum 72 credits |
| Activity credit (band, chorus, drama, KINS 100-184) |  |
| Total KINS 100-184 | maximum 1 credit |
| Total Band, chorus, drama | maximum 12 credits |
| Single course band, chorus, drama | maximum 4 credits |
| Extension credits |  |
| UW-System | no maximum |
| Other extension/correspondence | maximum $1 / 4$ of total |
| USAFI |  |
| USAFI | maximum 32 credits |

## Liberal Education Core

The University of Wisconsin-Eau Claire measures learning outcomes to ensure that its graduates have achieved a liberal education and prepared themselves to contribute to a complex society. Upon graduation, each undergraduate will have met the five learning goals of our liberal education core and the 12 learning outcomes they comprise.

| LIBERAL EDUCATION CORE REQUIREMENTS | a minimum of 36 credits |
| :---: | :---: |
| Knowledge Goal |  |
| Knowledge Outcome 1 (K1): Natural Sciences (http:// catalog.uwec.edu/undergraduate/attribute-k1/) | Two (2) <br> learning experiences |
| One experience in laboratory science must be selected from either K1 or K2. |  |
| Knowledge Outcome 2 (K2): Social Sciences (http:// catalog.uwec.edu/undergraduate/attribute-k2/) | Two (2) <br> learning experiences |
| One experience in laboratory science must be selected from either K1 or K2. |  |
| Knowledge Outcome 3 (K3): Humanities (http:// catalog.uwec.edu/undergraduate/attribute-k3/) | Two (2) learning experiences |
| Knowledge Outcome 4 (K4): Fine Arts (http:// catalog.uwec.edu/undergraduate/attribute-k4/) | One (1) learning experience |

## Skills Goal

| Skills Outcome 1 (S1): Written and Oral Communication (http:// | Two (2) |
| :--- | ---: |
| catalog.uwec.edu/undergraduate/attribute-S1/) | learning <br> experiences |

One S1 must meet the University Writing Requirement
(http://catalog.uwec.edu/undergraduate/graduation-

requirements/\#header10) \begin{tabular}{l}
Skills Outcome 2 (S2): Mathematics (http://catalog.uwec.edu/ <br>
undergraduate/attribute-S2/)

 

One (1) <br>
learning <br>
experience
\end{tabular}

One S2 to meet the University Mathematics Requirement
(http://catalog.uwec.edu/undergraduate/graduationrequirements/\#header11)

Skills Outcome 3 (S3): Creativity (http://catalog.uwec.edu/
One (1)
undergraduate/attribute-S3/) learning

## Responsibility Goal

| Responsibility Outcome 1 (R1): Equity, Diversity, and Inclusivity | Two (2) <br> (http://catalog.uwec.edu/undergraduate/attribute-R1/) |
| :--- | ---: |
|  | learning <br> experiences |

One R1 must satisfy Design for Diversity (http://
catalog.uwec.edu/undergraduate/attribute-DDIV/
\#header13)

| Responsibility Outcome 2 (R2): Global Perspectives (http:// |  |
| :--- | ---: |
| catalog.uwec.edu/undergraduate/attribute-R2/) | One (1) <br> learning <br> experience |
| Responsibility Outcome 3 (R3): Civic and Environmental Issues  <br> (http://catalog.uwec.edu/undergraduate/attribute-R3/) One (1) <br> learning <br> experience  |  |

## Integration Goal

Integration Outcome 1 (I1): Integration (http:// Two (2) catalog.uwec.edu/undergraduate/attribute-I1/) learning experiences

## Service-Learning Goal

Service-Learning (http://catalog.uwec.edu/undergraduate/
30 hours attribute-SL/\#header13)

## College Degree Requirements

## Bachelor of Arts or Bachelor of Science Degree

 (B.A./B.S.)University Graduation Requirements. All candidates for degrees must fulfill the requirements for credits, curriculum, GPA, and University residency as specified in the section of this catalog titled University Graduation Requirements (http://catalog.uwec.edu/undergraduate/graduationrequirements/).

College Graduation Requirements: Grade Point Averages. All candidates for degrees in the College of Arts and Sciences must earn minimum resident and total GPAs of 2.00 in the major, the minor, and the certificate. The resident and total GPAs for the major are computed using all attempted credits applicable to the major including those offered by departments other than the major department. The resident and total GPAs for the minor and the certificate are computed similarly.

Major-Minor and Major-Certificate Requirements. A standard major (a minimum of 36 credits) must be supplemented by a minor (a minimum of 24 credits) or by a certificate ( 12 to 18 credits) to meet graduation requirements for completing a first and second degree program. No minor or certificate is required with a Comprehensive Major ( 60 or more credits) or with two majors of 36 or more credits each.

Certain degree programs, which include Comprehensive Majors, may require more than the minimum of 120 credits for graduation.

Acceptable academic program combinations are determined at the college level. A major and a minor or a major and certificate or two majors (if available) may not be elected in the same department or program, except in the approved combinations listed here (http://catalog.uwec.edu/undergraduate/ arts-sciences/\#academicprogramstext).

College Credits. Earn at least 90 credits in courses offered by the College of Arts and Sciences.

## Bachelor of Arts Degree in the College of Arts and Sciences (B.A.)

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); foreign language competency at the 102 level. Foreign language competency may be met in one of two ways: (1) Achieve a score on the foreign language placement test that qualifies the student to enter the 201-level course in a foreign language. (2) Earn a grade of at least C (not C-) or a mark of S in a 102-level foreign language course (or AIS 112 or AIS 122 / LANG 122 or CSD 103).

## Bachelor of Science Degree in the College of Arts and Sciences (B.S.)

Fulfillment of all University Graduation Requirements (which includes the Liberal Education Core); all College-level degree requirements (major and minor/certificate emphases, GPAs, earning at least 90 credits in Arts and Sciences course work); mathematics competency at the MATH 111, MATH 112
or MATH 113 level. Mathematics competency can be met in one of three ways: (1) Achieve a score on the mathematics placement test that qualifies the student to enter MATH 114. (2) Earn a grade of at least C (not C-) or a mark of S in MATH 111, MATH 112, or MATH 113. (3) Achieve a satisfactory score on the MATH 112 competency test. This test may be attempted no more than two times.

## Major Requirements

## Liberal Arts (Code 141-001)

The Geospatial Analysis and Technology major will ground students in current geographic and geospatial traditions in a multidisciplinary learning approach. This comprehensive major integrates tools and skills with an engaging curriculum and high impact practices, such as internships and undergraduate research opportunities. It engages critical thinking both inside and outside the classroom. Specific areas of interest include Geographic Information Systems, Remote Sensing, LiDAR, Field Data Collection, Business Geographics, and Unmanned Aerial Systems.

## Minimum of 60 semester credits including:



Any 300 or 400 level geography course not noted in major

## requirements

| Subtotal | $43-44$ |
| :--- | :--- |
| Remaining credits to be chosen from the following with at | $16-17$ |
| least 6 credits from outside Geography: |  |
| Geography Geospatial Electives |  |

Geography Geospatial Electives

| GEOG 280 | Introduction to Cartography and <br> Visualization |
| :--- | :--- |
| GEOG 339 | Applied Cartography and <br> Geovisualization |
| GEOG 352 | Business Geographics |
| GEOG 358 | LiDAR Analysis \& Applications |
| GEOG 363 | Watershed Analysis |
| GEOG 390 | Geospatial Applications of UAS |
| GEOG 395 | Directed Studies ${ }^{2}$ |


| GEOG 399 | Independent Study - Juniors ${ }^{2}$ |
| :---: | :---: |
| GEOG 401 | Capstone Seminar ${ }^{1}$ |
| GEOG 435 | Geographic Information Systems III ${ }^{1}$ |
| GEOG 438 | Remote Sensing Data Analytics ${ }^{1}$ |
| GEOG 455 | Web Geographic Information Systems |
| GEOG 491 | Advanced Special Topics ${ }^{2}$ |
| GEOG 498 | Geography Internship ${ }^{1}$ |
| GEOG 499 | Independent Study - Seniors ${ }^{2}$ |
| Other Elective Options (Minimum of 6 credits) |  |
| IS 304 | Fundamentals of Business Programming |
| IS 307 | Introduction to Business Analytics |
| IS 310 | Business Process Modeling |
| IS 314 | Advanced Business Programming |
| IS 324 | System Development Methodologies |
| IS 344 | Database Management Systems |
| IS 345 | Networking with Client Operating Systems |
| CS 145 | Programming for New Programmers ${ }^{1}$ |
| CS 163 | Introduction to Programming in C++ |
| CS 170 | Computing for the Sciences and Mathematics ${ }^{1}$ |
| CS 245 | Advanced Programming and Data Structures |
| CS 318 | Fundamentals of Web Page Design ${ }^{1}$ |
| CS 319 | Introduction to Web Programming ${ }^{1}$ |
| ART 108 | Foundations: Two-Dimensional Design |
| ART 312 | Design Across the Disciplines |
| ENGL 312 | Science Writing |
| ENGL 313 | Technical Writing |
| ENT 371 | Introduction to Entrepreneurship |
| ENT 373 | New Venture Feasibility |
| MATH 445 | Survey Sampling |
| MATH 447 | Nonparametric Statistics |
| 1 If not taken for Core Requirements. <br> 2 If applicable and with consent of faculty adv |  |

## Program Learning Outcomes

Students completing this program will be expected to meet the following learning outcomes:

- Content:
- Geographic Foundation: Demonstrate geographical knowledge, understanding, and significance through analysis, explanation, and critique (Explain where things are located, why they are located where they are, what difference that location makes, and to whom).
- Skills:
- Geographic Techniques: Effectively use and apply the tools of geographic inquiry (e.g., field and laboratory to gather quantitative and qualitative geographic data; GIS to acquire, manage, display, and analyze spatial data in digital form; cartography to display spatial information effectively; and spatial statistical methods to model and make inferences about spatial relationships and patterns).
- Communication: Effectively explain how geographic approaches and perspectives are used to address socially/environmentally relevant questions and problems and why identifying the underlying spatial relationships is significant.
- Responsibility:
- Equity, Diversity, and Inclusion (EDI): Use geographic knowledge and skills to evaluate assumptions, representations, and institutions in order to challenge existing structures in ways that respect diversity and foster social/environmental equity and inclusivity.
- Ethics: Use geographic knowledge and skills to address social and environmental challenges in ways that maximize the benefits and minimize the harm to others.
- Dispositions:
- Interdisciplinary perspective: Synthesize the information, concepts, and methods of the humanities and the natural and social sciences for geographic research and applications.
- Relational perspective: Explain how people, places, and regions are linked by networks and processes across space and scale (such as local-global, within regions, globalization, trade, immigration, internet technology, climate).
- Comprehensive:
- Geospatial: Expertly use geospatial information/data and technologies to address geographical issues.


## Sample Degree Plan Geospatial Analysis and Technology, Comprehensive Major, B.S.

The following is a sample degree plan, based on the 2023-2024 catalog. It is based on the 120-credit graduation requirement and assumes no transferred credits, no requirements waived by placement tests, no courses taken in the summer or winter, no repeated courses, and no remedial courses that may be required. This sample degree plan is intended for first-year students entering UW-Eau Claire in the fall semester. Your own degree plan may differ depending on the course of study selected (second major, minor, etc.). UW-Eau Claire cannot guarantee all courses will be offered as shown, but will provide a range of courses that may enable prepared students to fulfill their requirements in a timely period. This sample degree plan is just a guide. Please consult your advisor, your degree audit, and the catalog to create your own degree plan. Note: In order to earn the required minimum of 120 credits for the degree in four years, you should plan to take 15 credits each semester or 30 credits each year.

To earn a degree, students must fulfill all University Graduation Requirements, including the Liberal Education (LE) Core. LE Core course work in the following sample degree plan uses abbreviations such as LE-K1, LE-S2, LE-R3, and LE-I1 to represent the learning outcomes students will meet via completion of their liberal education course work. Please click here (https://catalog.uwec.edu/ undergraduate/graduation-requirements/) for a description of the Liberal Education Core outcomes and requirements. Note that the LE Core may be completed through both course and non-course experiences.

Students in this major have the option to pursue either a Bachelor of Arts (B.A.) or a Bachelor of Science (B.S.) degree. The degrees are distinguished by foreign language competency for the B.A. and a higher level of mathematics competency for the B.S.

FIRST YEAR

## FIRST SEMESTER

GEOG 135
Planet Earth: Our Digital Globe (LE-S3)

| WRIT 114 | Intensive Blugold Seminar in Critical Reading and Writing (S1) | 5 |
| :---: | :---: | :---: |
| OR |  |  |
| WRIT 116 | Blugold Seminar in Critical Reading and Writing (LE-S1) |  |
| LE Option: Knowledge 3 (LE-K3) Humanities |  | 3 |
| LE Option: Skills 1 (LE-S1) Written and Oral Communication |  | 3 |
| SECOND SEMESTER |  |  |
| GEOG 104 | Planet Earth: The Physical Environment (LE-K1 + lab) | 4 |
| GEOG 111 | Planet Earth: Human Geography (LEK2, LE-I1) | 3 |
| LE Option: Knowledge 2 (LE-K2) Social Sciences |  | 3 |
| MATH 111 | A Short Course in Calculus (LE-S2) | 4 |
| OR |  |  |
| MATH 112 | Precalculus Mathematics (LE-S2) |  |
| OR |  |  |
| MATH 113 | Trigonometry (LE-S2) |  |
| Total |  | 28 |
| SECOND YEAR |  |  |
| FIRST SEMESTER |  |  |
| GEOG 200 | Foundations of Geography | 3 |
| IS 240 | Information Systems in Business | 3 |
| LE Option: Responsibility 1 (LE-R1) Equity, Diversity, and Inclusivity |  | 3 |
| LE Option: Knowledge 1 (LE-K1) Natural Sciences |  | 3 |
| LE Option: Knowledge 4 (LE-K4) Fine Arts |  | 3 |
| LE Option: Integration (I1) |  | 2 |
| SECOND SEMESTER |  |  |
| GEOG 335 | Geographic Information Systems I | 3 |
| CS 145 | Programming for New Programmers | 4 |
| LE Option: Responsibility 1 (LE-R1, DDIV) Equity, Diversity, and Inclusivity with Design for Diversity |  | 3 |
| LE Option: Knowledge 3 (LE-K3) Humanities |  | 3 |
| LE Option: Responsibility 3 (LE-R3) Civic and Environmental Issues |  | 3 |
| Total |  | 33 |
| THIRD YEAR |  |  |
| FIRST SEMESTER |  |  |
| GEOG 336 | Geospatial Field Methods | 3 |
| GEOG 370 | Quantitative Methods in Geography | 3 |
| LE Option: Knowledge 3 (LE-K3) Humanities |  | 3 |
| Geospatial Elective ${ }^{\text {a }}$ |  | 3 |
| Geospatial Elective |  | 3 |
| SECOND SEMESTER |  |  |
| GEOG 337 | Geographic Information Systems II | 3 |
| GEOG 338 | Remote Sensing of the Environment | 3 |
| GEOG Elective |  | 3 |
| Geospatial Elective |  | 3 |
| Elective ${ }^{\text {b }}$ |  | 3 |
| Total |  | 30 |
| FOURTH YEAR |  |  |
| FIRST SEMESTER |  |  |


| GEOG 498 | Geography Internship | 3 |
| :--- | :--- | :---: |
| Geospatial Elective | 3 |  |
| Geospatial Elective | 3 |  |
| LE Option: Responsibility 2 (LE-R2) Global Perspectives | 3 |  |
| Elective | 3 |  |
| SECOND SEMESTER |  |  |
| GEOG 435 | Geographic Information Systems III | 3 |
| Geospatial Elective | 3 |  |
| Geospatial Elective | 3 |  |
| Elective | 3 |  |
| Elective | 3 |  |
| Total | 30 |  |

## Minimum total for the baccalaureate degree $=120$ credits

a Environmental Geography and Geospatial comprehensive majors are required to take 12 credits of related course work outside of the major with consent of their advisor.
b Electives need to be carefully selected to ensure that a student's degree comprises at least 39 credits of upper division courses (300-400 level). While students are encouraged to take additional courses in geography, these can be selected from any discipline provided student meets course prerequisites. Required Geography courses plus Geography electives (and environmental electives from other departments) must equal at least 60 credits.

Note: All students must complete the 30-hour Service-Learning Requirement via a non-credit or credit option (see University Graduation Requirements (http://catalog.uwec.edu/undergraduate/graduation-requirements/)).

## Course Information

- GEOG 200 is recommended prior to enrollment in GEOG 335 and GEOG 370.
- GEOG 335 is a prerequisite for GEOG 370.
- Student must complete one upper-level GEOG course in an advanced geography approach that is not a Geospatial course (300/400).
- Student must choose either GEOG 435 or GEOG 438 and will be advised to follow similar courses for additional Geospatial Elective (i.e. GEOG 438 would lead into GEOG 358 LiDAR)
- Student can take either GEOG 401 Capstone or GEOG 498 Internship.
- With consent of advisor, a minimum of 12 credits must be taken outside of Geography. Six outside credits are earned by the requirement of CS 145 or CS 170 or CS 318 or CS 319 and IS 240 .
- Required Geography courses plus CS 145 or CS 170 or CS 318 or CS 319 and IS 240 plus Geography electives (and Geospatial Electives and electives from other departments) must equal at least 60 credits.


## RECOMMENDATIONS FOR OPTIONAL HIGH IMPACT PRACTICES (HIPs)

The University of Wisconsin-Eau Claire encourages all students to participate in High Impact Practices. The following information identifies any specific recommendations that faculty in this major have concerning which HIPs might be most beneficial to students, and any recommendations about when those HIPs best fit into the degree plan. Students should also consult their faculty advisor for information on HIPs. There are many additional high impact opportunities available. Talk to your academic advisor for more information about incorporating HIPs like Study Abroad (https://
studyabroad.apps.uwec.edu/), Intercultural Immersion (https://www.uwec.edu/ immersion/), Internship (https://www.uwec.edu/career-services/info-students/ internships/), and/or Student/Faculty Collaborative Research (https:// www.uwec.edu/orsp/students/student-faculty-collaborative-research-guide/) into your time at UW-Eau Claire.

Required HIP: GEOG 498: Geography Internship or GEOG 401: Geography Capstone
Optional HIPs: GEOG 368: Geography Field Seminar , Study Abroad, National Student Exchange, Faculty-led International Immersions (FLIIs), Student-Faculty Collaborative Research

## Liberal Education (LE) Core Guidance

## Liberal Education Core (LE Core)

The LE Core comprises 17 learning experiences across 11 learning outcomes. Students must complete a minimum of 36 credits in courses approved for the LE Core.

- K1 - Natural Sciences; two experiences (one lab science experience is required in K1 or K2).
- K2 - Social Sciences; two experiences (one lab science experience is required in K1 or K2).
- K3 - Humanities; two experiences.
- K4 - Fine Arts; one experience.
- S1 - Written and Oral Communication; two experiences (one experience must satisfy the University writing requirement).
- S2 - Mathematics; one experience (must satisfy the University math competency requirement).
- S3 - Creativity; one experience (can be fulfilled in a student's major).
- R1 - Equity, Diversity, and Inclusivity; two experiences (one experience must meet the UW System Design for Diversity (DD) requirement).
- R2 - Global Perspectives; one experience.
- R3 - Civic and Environmental Issues; one experience.
- I1 - Integration; two experiences (one experience can be fulfilled in a student's major).
- SL—Service Learning; 30 hours


## Additional LE Core Information

- Most LE Core learning experiences are course based, and many courses meet more than one learning outcome (e.g., K3 and R2 or K1 and R3).
- Some learning experiences can also be met outside of a traditional course (e.g., undergraduate research (S3), study abroad (I1)).
- S1 - An English placement score that fulfills the University writing requirement fulfills one S1 experience.
- S1 - A foreign Language placement score that qualifies the student to enter the 102 level satisfies one S1 experience.
- S1, R2 - A foreign language placement score that qualifies the student to enter the 202 level satisfies one experience in S1 and the R2 experience.
- S2 - A math placement score that qualifies the student to enter Math 111, 112,113 or 114 fulfills the $S 2$ experience.
- S3 - Completion of two credits from any approved music ensemble fulfills the S3 experience.
- I1 - Any semester long study abroad program can fulfill one I1 experience.

