

GEOGRAPHIC INFORMATION SYSTEMS

Graduate Program Head	Anthony C. Robinson
Program Code	GIS
Campus(es)	World Campus (M.G.I.S.)
Degrees Conferred	Master of Geographic Information Systems (M.G.I.S.)
The Graduate Faculty	View (https://secure.gradsch.psu.edu/gpms/?searchType=fac&prog=GIS)

The Master of Geographic Information Systems (M.G.I.S.) degree is awarded to students who demonstrate mastery of the technical competencies and leadership skills required to design, manage, and use geographic information technologies in a wide range of professional fields.

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (<https://gradschool.psu.edu/graduate-admissions/how-to-apply/>). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

The language of instruction at Penn State is English. English proficiency test scores (TOEFL/IELTS) may be required for international applicants. See GCAC-305 Admission Requirements for International Students (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-305-admission-requirements-international-students/>) for more information.

Additional requirements imposed by the Department of Geography include:

- Statement of professional experience and goals. A résumé should be attached as a supplement, but the statement itself should be an essay (two to three pages) that demonstrates the applicant's written communication skills and clarifies the applicant's objectives in completing the degree program;
- Two letters of recommendation that attest to the applicant's readiness for graduate study;
- Official transcripts from all post-secondary institutions attended (<http://www.gradschool.psu.edu/prospective-students/how-to-apply/new-applicants/requirements-for-graduate-admission/>), including the institution that conferred the applicant's baccalaureate degree (and any graduate degrees, if applicable);
- Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) score, if applicable;
- Nonrefundable application fee.

Applications will be evaluated by the M.G.I.S. Admissions Committee based on the applicants' technical qualifications for the program relative to their previous educational experience, academic interests, and English Language proficiency. In general, successful applicants are expected to have earned an undergraduate grade-point average of at least 3.0 on a 4.0 scale. Applicants with a marginal record are encouraged to first complete a related Graduate Certificate before applying for admission to the M.G.I.S. program. Exemplary performance in the Graduate Certificate

will be taken into consideration for possible admission into the M.G.I.S. program, but completion of a certificate does not imply or guarantee admission into a degree program.

Credits earned at other institutions but not used to earn a degree may be applied toward the requirements for a graduate degree, subject to restrictions outlined in GCAC-309 Transfer Credit. (<http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/transfer-credit/>)

Degree Requirements

Master of Geographic Information Systems (M.G.I.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

Students earn the M.G.I.S. degree by successfully completing 33 credits of course work, including a supervised culminating project. Course requirements include a minimum of 18 credits at the 500 or 800 level, with at least 6 credits at the 500 level.

The culminating experience for the degree is an independent project completed while enrolled in GEOG 870. The independent project completed in GEOG 870 demonstrates the student's ability to apply advanced knowledge and skills related to geographic information systems in a way that makes a substantial contribution to their professional work. The culminating experience will include a formal presentation and scholarly paper.

Code	Title	Credits
Required Courses		
GEOG 482 or GEOG 581	Making Maps That Matter With GIS Spatial Data Science Ethics	3
GEOG 483	Problem-Solving with GIS	3
GEOG 484	GIS Database Development	3
GEOG 583	Geospatial System Analysis and Design	3
GEOG 871	Geospatial Technology Project Management	3
GEOG 586	Geographical Information Analysis	3
Electives		12
Culminating Experience		
GEOG 870	Capstone in Geographic Information Systems	3
Total Credits		33

In lieu of specified prescribed and elective courses, M.G.I.S. students may elect to substitute those for courses that comprise an option. There are two option choices: Geospatial Intelligence Option (15 credits) and Geodesign Option (12 credits).

Geospatial Intelligence Option

M.G.I.S. students who choose to complete the Geospatial Intelligence Option may substitute the 15 credits that comprise the option for 15 credits of prescribed and elective courses (including GEOG 482 or GEOG 864, GEOG 483, and GEOG 484). This option is designed for current or aspiring practitioners in government agencies, businesses, and non-governmental organizations that rely on insights produced through skillful, knowledgeable, and conscientious analysis of diverse georeferenced data to plan for emergencies, to coordinate responses to natural and human induced disasters, to enforce the law, and to plan and conduct military operations.

Code	Title	Credits
Required Courses		
GEOG 583	Geospatial System Analysis and Design	3
GEOG 586	Geographical Information Analysis	3
GEOG 871	Geospatial Technology Project Management	3
Geospatial Intelligence Option Courses		
GEOG 571	Intelligence Analysis, Cultural Geography, and Homeland Security	3
GEOG 882	Geographic Foundations of Geospatial Intelligence	3
GEOG 883	Remote Sensing Image Analysis and Applications	3
GEOG 884	Spatial Data Science and Intelligence Analysis	3
GEOG 885	Analytical Methods and GeoAI in Geospatial Intelligence	3
Electives		6
Culminating Experience		
GEOG 870	Capstone in Geographic Information Systems	3
Total Credits		33

Geodesign Option

In lieu of 3 credits of a prescribed introductory course (GEOG 484) plus 9 additional elective credits, M.G.I.S. students may substitute 12 credits associated with courses that comprise the Geodesign Option. This option is designed for current or aspiring professionals in government agencies, businesses, and non-profit organizations who see limitations in current regional and urban planning and design approaches, and who seek a foundation in geospatially-based design through investigating the methods and collaborative nature of the Geodesign process.

Code	Title	Credits
Required Courses		
GEOG 482	Making Maps That Matter With GIS	3
or GEOG 581	Spatial Data Science Ethics	
GEOG 483	Problem-Solving with GIS	3
GEOG 583	Geospatial System Analysis and Design	3
GEOG 586	Geographical Information Analysis	3
GEOG 871	Geospatial Technology Project Management	3
Geodesign Option Courses		
GEODZ 511	Geodesign History, Theory, Principles	3
GEODZ 822	GeoDesign Models I: Evaluation and Decision	3
GEOG 487	Environmental Challenges in Spatial Data Science	3
GEOG 865	Cloud and Server GIS	3
Electives		3
Culminating Experience		
GEOG 870	Capstone in Geographic Information Systems	3
Total Credits		33

Minor

A graduate minor is available in any approved graduate major or dual-title program. The default requirements for a graduate minor are stated in Graduate Council policies listed under GCAC-600 Research Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>) and GCAC-700 Professional Degree Policies (<https://gradschool.psu.edu/graduate-education-policies/>), depending on the type of degree the student is pursuing:

- GCAC-611 Minor - Research Doctorate (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-611-minor-research-doctorate/>)
- GCAC-641 Minor - Research Master's (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-641-minor-research-masters/>)
- GCAC-709 Minor - Professional Doctorate (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-709-professional-doctoral-minor/>)
- GCAC-741 Minor - Professional Master's (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-741-masters-minor-professional/>)

Student Aid

World Campus students in graduate degree programs may be eligible for financial aid. Refer to the Tuition and Financial Aid section (<https://www.worldcampus.psu.edu/tuition-and-financial-aid/>) of the World Campus website for more information.

Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Geography (GEOG) Course List (<https://bulletins.psu.edu/university-course-descriptions/graduate/geog/>)

Learning Outcomes

1. **KNOW:** Graduates will demonstrate the technical and analytical competencies required to effectively design, manage, and apply geographic information technologies to create solutions to challenges in a wide range of professional domains.
2. **APPLY/CREATE:** Graduates will apply geographic information technologies using appropriate data, accepted analytical methods, and evaluation criteria to develop solutions for a variety of complex scenarios.
3. **COMMUNICATE:** Graduates will communicate technical knowledge, including ideas, designs, data analysis, findings, or decision justification in appropriate written and oral presentation formats.
4. **THINK:** Graduates will demonstrate proficiency of geospatial information technology to define problems, create and implementation analytical solutions to address challenges within a variety of domains.
5. **PROFESSIONAL PRACTICE:** Graduates will demonstrate professional standards and ethical practices, engage in professional and community-based service, and develop the skills required to lead geospatial technology organizations.

Contact

Campus	World Campus
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Program Website	View (https://gis.e-education.psu.edu/mgis/)