GIS & GeoInformatics

Degrees Offered

- Master of Science in GIS & GeoInformatics (Non-Thesis)
- Graduate Certificate of GIS & GeoInformatics: Geospatial Information Technology
- Graduate Certificate of GIS & GeoInformatics: GIS for Geohazards Evaluation
- Graduate Certificate of GIS & GeoInformatics: GIS for Environmental Studies
- Graduate Certificate of GIS & GeoInformatics: GIS for Natural Resources Assessment

Program Description

The interdisciplinary online program in Geographic Information System (GIS) and GeoInformatics (GIS & GeoInformatics) focuses on the applications of GIS technology, hands-on geospatial training, multi-criteria decision making, advanced application and quantitative analysis aspects of GIS and Remote Sensing (RS), and is directly aligned with Colorado School of Mines' emphasis on, and strength in, Earth, Energy and Environment. Our programs will enhance students' quantitative geospatial data analysis skills, help the students get ahead of the technology curve, and enable professionals to advance their careers.

Certificate and Degree Requirements

We offer four graduate certificates and a non-thesis Master of Science degree. The courses taken for certificate degrees can be used towards the Master's degree. These programs are available as an online program.

The Master of Science (Non-Thesis) Program in GIS & GeoInformatics

The Master of Science (Non-Thesis) Program outlined below may be completed by individuals already holding an undergraduate or advanced degree or as a combined degree program by individuals already matriculated as undergraduate students at Colorado School of Mines. Courses taken while working on any of the four GIS & GeoInformatics graduate certificates can be applied to this Master of Science program. The program is comprised of a total of 30 credit hours.

All Master of Science (Non-Thesis) program will include the following core requirements:

GEGN575	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	3.0
SYGN588	GIS-BASED REAL WORLD LEARNING PROJECT I - FUNDAMENTALS	3.0
SYGN590	GIS-BASED REAL WORLD LEARNING PROJECT II - ADVANCED APPLICATIONS	3.0
And, the following seven courses:		
GEGN542	ADVANCED DIGITAL TERRAIN ANALYSIS	3.0
GEGN580	APPLIED REMOTE SENSING FOR GEOENGINEERING AND GEOSCIENCES	3.0
DSCI403	INTRODUCTION TO DATA SCIENCE	3.0
GEOL557	EARTH RESOURCE DATA SCIENCE 1: FUNDAMENTALS	3.0

GEOL558	EARTH RESOURCE DATA SCIENCE 2: APPLICATIONS AND MACHINE-LEARNING	3.0
DSCI530	STATISTICAL METHODS I	3.0
CEEN501	LIFE CYCLE ASSESSMENT	3.0

Students attending on campus also may select from semester based, in person courses GEGN532, GEGN568, CEEN581.

Mines Combined Undergraduate / Graduate Program

Students enrolled in Mines' combined undergraduate/graduate program may double count up to six credits of graduate coursework to fulfill requirements of both their undergraduate and graduate degree programs. These courses must have been passed with "B-" or better, not be substitutes for required coursework, and meet all other University, Department, and Program requirements for graduate credit.

Students are advised to consult with their undergraduate and graduate advisors for appropriate courses to double count upon admission to the combined program.

The Graduate Certificate Programs in GIS & GeoInformatics outlined below may be completed by individuals already holding an undergraduate or advanced degree or as a combined degree program by individuals already matriculated as graduate students at Colorado School of Mines. The graduate certificate is comprised of:

Course Work	12.0
Total Semester Hrs	**12.0**

Up to 3.0 credits can be at the 400- level and the remainder will be 500 or 600 level as listed below.

There are four certificates with different specialization areas, namely Geospatial Information Technology, Geohazards Evaluation, Environmental Studies, and Natural Resources Assessment.

Graduate Certificate of GIS & GeoInformatics: Geospatial Information Technology

Students working towards a Graduate Certificate of GIS & GeoInformatics with specialization in **Geospatial Information Technology** are required to take any four of the following courses:

One Required Course:		
GEGN575	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	3.0
And, any three of the following courses:		
GEGN542	ADVANCED DIGITAL TERRAIN ANALYSIS (One Required Course:)	3.0
GEGN580	APPLIED REMOTE SENSING FOR GEOENGINEERING AND GEOSCIENCES	3.0
CEEN501	LIFE CYCLE ASSESSMENT	3.0
DSCI403	INTRODUCTION TO DATA SCIENCE	3.0
GEOL557	EARTH RESOURCE DATA SCIENCE 1: FUNDAMENTALS	3.0
GEOL558	EARTH RESOURCE DATA SCIENCE 2: APPLICATIONS AND MACHINE-LEARNING	3.0
DSCI530	STATISTICAL METHODS I	3.0

Students attending on campus also may select from semester based, in person courses GEGN532, GEGN568, CEEN581.

Graduate Certificate of GIS & GeoInformatics: Geohazards Evaluation

Students working towards a Graduate Certificate of GIS & GeoInformatics with specialization in **Geohazards Evaluation** are required to take:

One Required Course:

GEGN575	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	3.0
And, any three of the following courses:		
GEGN542	ADVANCED DIGITAL TERRAIN ANALYSIS	3.0
GEGN580	APPLIED REMOTE SENSING FOR GEOENGINEERING AND GEOSCIENCES	3.0
GEOL557	EARTH RESOURCE DATA SCIENCE 1: FUNDAMENTALS	3.0
GEOL558	EARTH RESOURCE DATA SCIENCE 2: APPLICATIONS AND MACHINE-LEARNING	3.0
DSCI530	STATISTICAL METHODS I	3.0
CEEN501	LIFE CYCLE ASSESSMENT	3.0

Students attending on campus also may select from semester based, in person courses GEGN532, GEGN568.

Graduate Certificate of GIS & GeoInformatics: Environmental Studies

Students working towards a Graduate Certificate of GIS & GeoInformatics with specialization in **Environmental Studies** are required to take:

Two Required Courses:

GEGN575	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	3.0
CEEN501	LIFE CYCLE ASSESSMENT	3.0
And, any two of the following courses:		
GEGN542	ADVANCED DIGITAL TERRAIN ANALYSIS	3.0
GEGN580	APPLIED REMOTE SENSING FOR GEOENGINEERING AND GEOSCIENCES	3.0
DSCI403	INTRODUCTION TO DATA SCIENCE	3.0
GEOL557	EARTH RESOURCE DATA SCIENCE 1: FUNDAMENTALS	3.0
GEOL558	EARTH RESOURCE DATA SCIENCE 2: APPLICATIONS AND MACHINE-LEARNING	3.0
DSCI530	STATISTICAL METHODS I	3.0

Students attending on campus also may select from semester based, in person courses GEGN532, GEGN568, CEEN581.

Graduate Certificate of GIS & GeoInformatics: Natural Resources Assessment

Students working towards a Graduate Certificate of GIS & GeoInformatics with specialization in **Natural Resources Assessment** are required to take:

One Required Course:

GEGN575	APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS	3.0

And, any three of the following courses:

GEGN580	APPLIED REMOTE SENSING FOR GEOENGINEERING AND GEOSCIENCES	3.0
DSCI403	INTRODUCTION TO DATA SCIENCE	3.0
GEOL557	EARTH RESOURCE DATA SCIENCE 1: FUNDAMENTALS	3.0
GEOL558	EARTH RESOURCE DATA SCIENCE 2: APPLICATIONS AND MACHINE-LEARNING	3.0
DSCI530	STATISTICAL METHODS I	3.0

Students attending on campus also may select from semester based, in person courses GEGN532, GEGN568, CEEN581.

Program Director

Wendy Zhou, Professor, Geology & Geological Engineering

Program Associate Director

Sebnem Duzgun, Professor, Fred Banfield Endowed Chair in Mining Engineering

Professors

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Teaching Associate Professor

Wendy Fisher, Computer Science, Teaching Associate Professor and Associate Department Head

Research Associate Professor

Zane Jobe, Research Associate Professor, Chevron Center of Research Excellence Director, Geology & Geological Engineering