Strategies for Cultivating Successful Virtual Internships in GIS

GeoEd Conference '22 – June 7, 2022

Monroe Community College
STATE UNIVERSITY OF NEW YORK

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Welcome and Introductions

Poll question: Have you offered a virtual internship for your students?

MCC's GIST Team:

Jonathon Little: Geography/GIST Professor + NSF ATE Principal Investigator

Wayne Howard: GIST Professor + Senior Collaborator
Co-owner of Solara Concepts

Heather Pierce: Geography/GIST Professor + Co-PI

Catherine DuBreck: MCC GIST + Co-PI

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MCC's Geospatial program

- Stackable:
  - 24 Credit GIST Certificate
  - A.A.S. in GIST
  - 9-credit micro-credential for GIST professionals
  - All fully accessible on campus and online
- A.S. Geography concentration in GIST

AAS in Geospatial Information Science & Technology (GIST)

Table 1			
FALL Year 1	**Cr**	**SPRING Year 1**	**Cr**
Introduction to GIST	3	***Web Mapping***	3
Cartography	3	Spatial Analysis	3
English	3	Art/Foreign Language	3
Introduction to Remote Sensing	3	Physical Geography Lab	1
Math	3	Physical Geography	3
		Physical/Health Education	2
FALL Year 2	**Cr**	**SPRING Year 2**	**Cr**
UAS Data Acquisition and Management	3	***Introduction to Programming for GIS***	3
Statistics	3	Capstone Course in Geospatial Technology	2
Elective	3	American History	3
Human Geography	3	Program Elective	3
Elective	3	Elective	3
		Elective	3

Micro-credential for GIST Professionals

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Micro-credential

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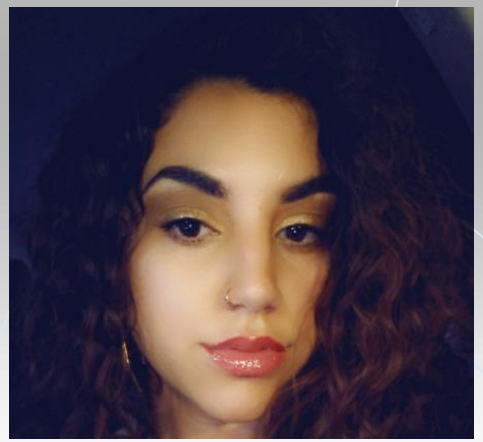
Alumni Mentoring

Four alumni are providing support to our current students!

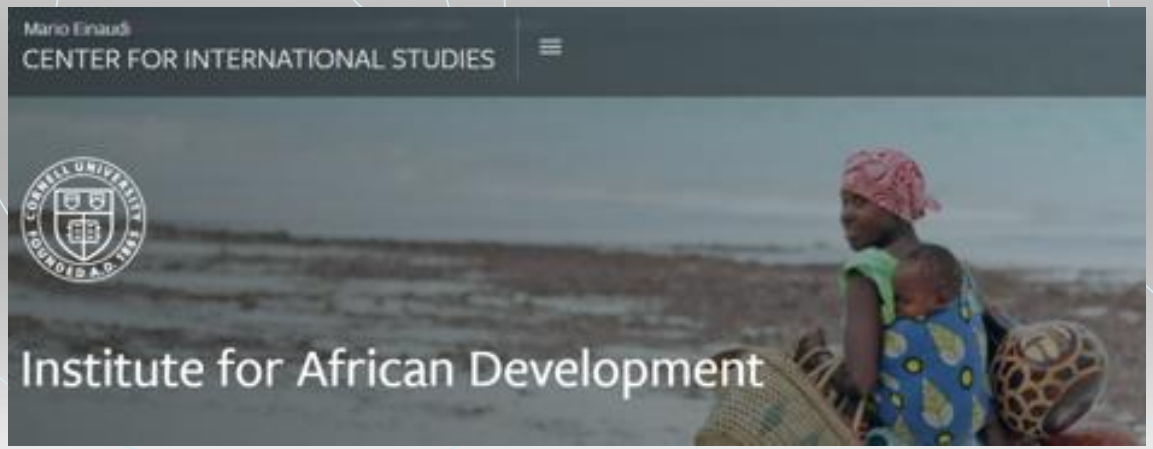


Virtual Internships/Partnerships include:

- National GeoTech Center of Excellence
- New York Geographic Alliance
- New York State Department of Environmental Conservation
- NY State Department of State at University of Albany
- GIS Scholars (Inner City Rochester GIS program)
- EagleView
- Freshwater Future – Petoskey Michigan
- FLOW – For the Love of Water – Traverse City Michigan
- Water for South Sudan
- SUNY Cortland
- American Red Cross – Rochester New York
- New York Sea Grant
- Genesee Land Trust
- MCC Library
- River Area Council of Governments (RACOG)

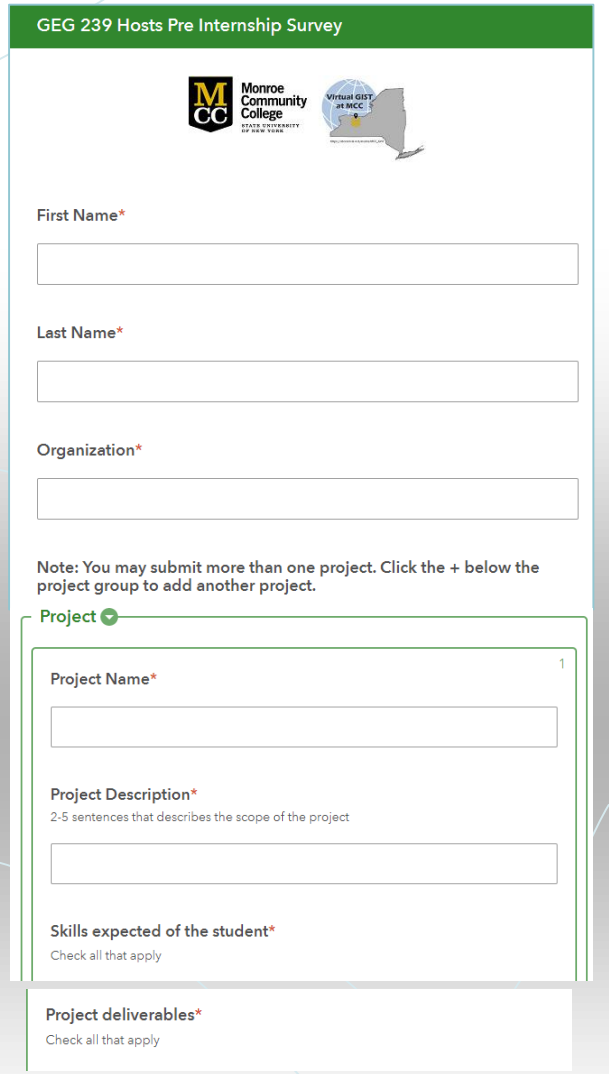
Global Virtual Internships

- Colombia: Fundación Universitaria Tecnológico Comfenalco
- Costa Rica: Monteverdi Institute
- Mexico: Universidad Autónoma de San Luis Potosí
- Kazakhstan: Kazakh State Agrotechnical University
- Malawi: Cornell University and partner in Malawi



Virtual Internship process and timeline

1. Host develops tentative project ideas (Oct/Nov) for Capstone course.
2. Host completes a pre-assessment survey (using Survey123) to match organization needs with student skills and interests (Dec).
3. Students entering the GIST Capstone Course develop a resume, send it to the instructor, and complete a pre-assessment survey (Dec).


GEG 239 Hosts Pre Internship Survey

Monroe Community College

First Name*

Last Name*

Organization*

Note: You may submit more than one project. Click the + below the project group to add another project.

Project

Project Name*

Project Description*

2-5 sentences that describes the scope of the project

Skills expected of the student*

Check all that apply

Project deliverables*

Check all that apply

Virtual Internship process and timeline

4. The Virtual Internship Coordinator meets with the Host organizations to discuss expectations and student skills to help find the best match (Jan).

5. Selection committee: Student matched with host (Jan).

6. Class begins late January.

7. Each student meets with instructor via Zoom to discuss the project Goals & Objectives and internship expectations (late Jan/early Feb).

8. Host organizations begin to meet virtually with students via Zoom (early Feb).

Virtual Internship process and timeline

9. Host organizations continue to meet with students weekly or bi-weekly (via Zoom and/or email), (Feb-May).

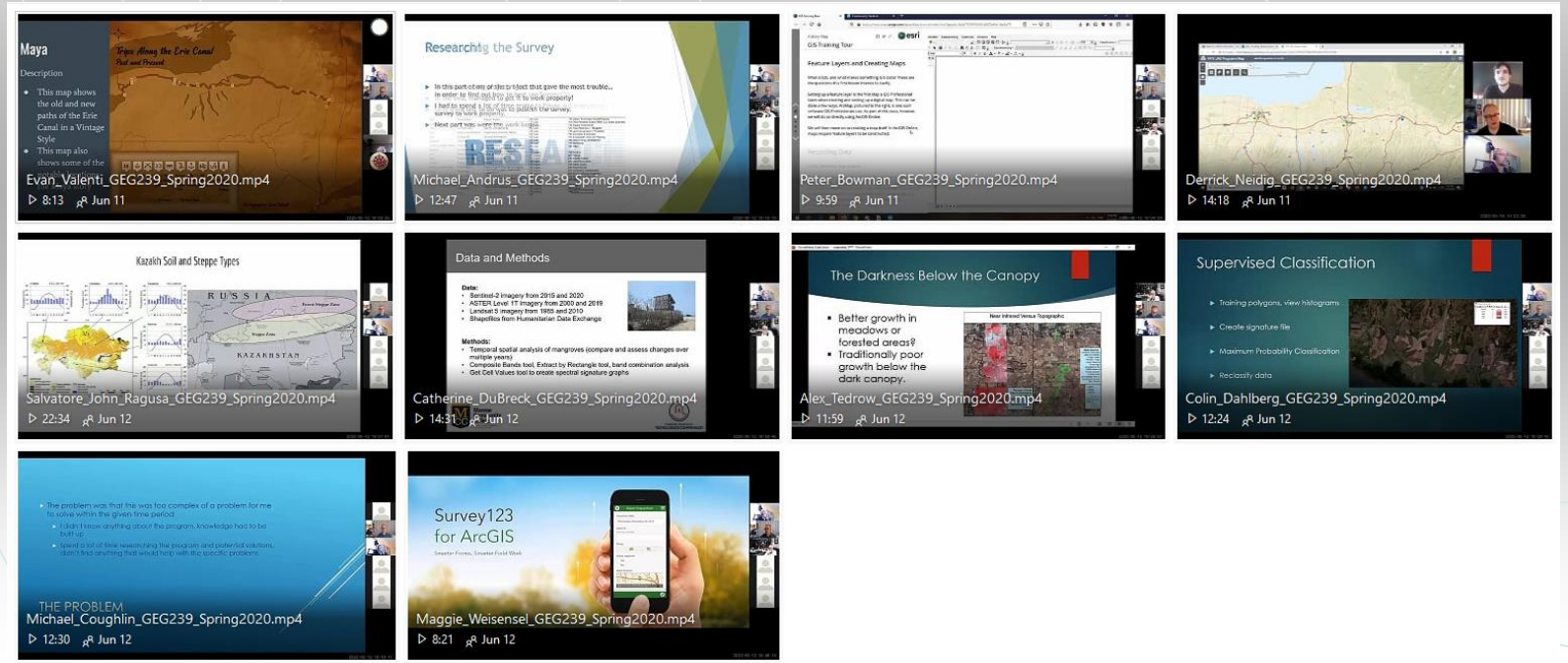
10. Instructor reaches out to the host to continue their dialog with the host (late Feb, early April, & early May).

11. Students produce status updates and “hard-product” reports, end of March and early May.

Virtual Internship process and timeline

12. At the conclusion of the project, students present their work virtually (or in person) mid-May. Hosts are encouraged to attend virtually.

13. The students and host organizations complete post-assessment surveys (mid-May).



The Top 8 Strategies for Cultivating Successful Virtual Internships in GIS

1. Establish a foundation.
2. Develop great relationships with the hosts.
3. Find the right student match for the internship project.
4. Establish ground rules.
5. Have a good game plan and execute it well.
6. Pay attention to the fundamentals.
7. Know when you need to be a cheerleader.
8. Celebrate the results!

1. Establish a foundation

- We provide directed internships in MCC's Capstone in GIST Course (GEG 239).
- We look to "meet students where they are" on their career journey.
- Our key to success: Produce something of value for the host organization – in exchange for the host providing outside the classroom GIS experience.
- Result: Three consecutive years of providing internships for all students (approximately 12-14 students/semester).

2. Develop and maintain great relationships with our hosts

- Start early and think broadly!
- Maintain relationships – we have several organizations that have hosted with us multiple times.
- Frequently meet with the hosts
- Host pre-internship survey
- Host post-internship survey

3. Find the Right Student Match for Each Internship Project

- Match projects to student's interests and skillset
- Student resume
- Student pre-internship survey
- Committee consensus
- Gut feeling

4. Establish Ground Rules

- Hosts and school sign an Affiliation Agreement.
- Students sign Internship Agreements that outlines expectations.
- Rules for classroom discussions.
- Require that cameras be on!

5. Have a good game plan – and execute it well

- Promote great communication from the onset!
- Follow the “game plan” and set expectations:
- Purpose Statement
- Goals and Objectives – list, refine and prioritize
- Status updates – good project management
- Weekly or bi-weekly student meetings with host
- Bi-weekly Instructor/Student meetings
- Project reports – show evidence of progress
- Record hours – minimum of 45 hours
- Breakout discussions – their struggles are not unique.

6. Pay attention to the fundamentals!

- Review topics: Map symbology and classification, Projections and Scale, Remote sensing skills, Site suitability analysis, Ethics in GIS, Mobile apps, etc.
- Develop professional “soft” skills:
- Enhancing your resume
- Are you Career Ready?
- Virtual interviews
- Social media and web conferencing
- Build an online GIS Portfolio

7. Know when you need to be a cheerleader

- Boost a student’s self-confidence.
- Often a slow-starting internship is simply the result of a student's paralysis by analysis – or simple procrastination.
- Help them to overcome their tendency to be perfectionists. Some students are reluctant to share anything with you until it's perfect.

8. Celebrate your success!

- Student presentations on Zoom with hosts and department professors.
- Follow up with hosts: thank you and survey.

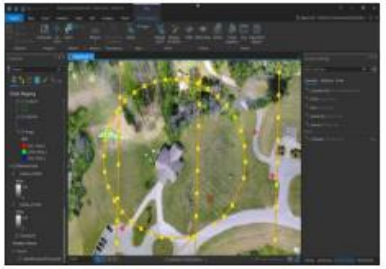
Every Fall

Geospatial Data Acquisition and Management

GEG 236 (3 credit hours) - Part of the micro-credential series (GEG 236, 237, 238), the A.A.S. in GIST and as an elective in the GIST Certificate program.

This course addresses the interpretation and understanding of a variety of data formats used by geospatial professionals. It introduces the fundamental concepts such as primary Geospatial Information Science (GIS) data creation, geodatabase design and creation, data management, and discusses quantitative techniques for the collection, classification, integration, and management of geographical data. Advanced topics include: UAS data collection and processing, mobile data collection, automation using Python and enterprise geodatabases. Students will be guided through a series of lectures hands-on computer-based exercises, and an end of semester project.

Prerequisites: Introduction to Remote Sensing (GEG 133) or permission of the instructor.



Students in this course:

- Learn important geospatial data management skills that are in high demand!
- Learn the fundamentals of UAS (drone) training, safety, mission and flight planning.
- Develop skills in UAS data collection and processing.
- Learn advanced skills in mobile data collection.
- Interact in a multi-user environment using postGIS.

Topics covered:

- Data models, data formats and data management
- Best practices for data collection and processing
- Database management systems and schema
- Advanced geodatabase design
- Topology
- Enterprise geodatabase design
- Using QGIS in a multiuser, postGIS environment
- Introduction to Python automation

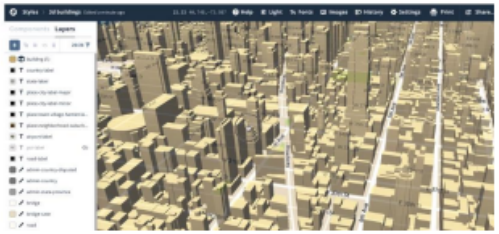
Every Spring

Web Mapping

GEG 237 (3 credit hours) Part of the new micro-credential series (236, 237, 238)

This course is an introduction to Web-based GIS. Students will learn about the usefulness and application of Web GIS tools such as ArcGIS Online Story Maps, Esri Dashboard, Esri Insights, Volunteered Geographic Information (Open Street Map), and Map services (Mapbox or GISCloud). Students will become adept at storing and accessing spatial data in the cloud, practice developing Story Maps to communicate spatial data, and learn how web mapping is key to mobile GIS applications such as field data collection (Esri Field Maps). Students will be guided through a series of lectures and hands-on computer-based lab exercises. An end of a semester project will allow students to work on a project of their own design. Course material used are based upon the United States Department of Labor's Geospatial Technology Competency Model (GCTM) for entry level geospatial occupations including Geospatial or GIS Technicians or Technologists.

Prerequisites: Digital Earth (GEG 130) or permission of the instructor.



Students in this course:

- Learn important geospatial web mapping skills that are in high demand!
- Apply web GIS tools such as ArcGIS Story Maps, Open Street Maps, and MapBox.
- Develop field data collection apps.
- Apply cartographic principles in online map design.
- Practice using web maps as a tool for topics such as emergency management.

Topics covered:

- Web Mapping vs. Desktop
- Spatial Data in the cloud
- Web GIS platforms
- Online map publication on a web service
- Story Map Design
- Apply critical-thinking skills to solve problems by using Web GIS tools in the development, management, completion, and evaluation of a comprehensive geospatial project.

SPRING 2022

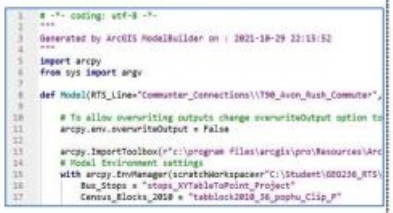
Introduction to Geospatial Programming

GEG 238 (3 credit hours)

Part of the micro-credential series (GEG 236, 237, 238) and the A.A.S. in GIST.

This course teaches how to customize and automate Geospatial Information Science (GIS) applications using the Python scripting language. Automation can make your work easier, faster, and more accurate, and knowledge of a scripting language is a highly desired skill in GIS analysis. Upon completion, students will be able to solve geospatial problems and streamline GIS workflows through the creation and modification of scripts. Students will be guided through a series of lectures and hands-on computer-based lab exercises. Course material used are based upon the United States Department of Labor's Geospatial Technology Competency Model (GCTM) for entry level geospatial occupations including Geospatial or GIS Technicians or Technologists.

Prerequisites: GEG 130, GEG 133, and GEG 230 or GEG 236 all with a grade of C or higher or permission of the instructor.



Students in this course:

- Learn to automate geoprocessing tools and to modify and create scripts in Python.
- Learn geospatial coding best practices.
- Design and develop custom GIS applications.
- Modify user interfaces to increase productivity.
- Understand introductory programming concepts, methods, approaches and workflows.
- Explain advanced programming concepts.

Topics covered:

- Introduction to Python and geoprocessing tools.
- Model Builder and programming fundamentals.
- Geoprocessing and object-oriented programming.
- GIS inventory using the data access module.
- Debugging and error handling.
- Data access and creation with geodatabases.
- Working with geometry and map layout.
- Jupyter notebooks.

Questions/Comments and Thank you!

Email:

Jon jlittle@monroecc.edu

Wayne whoward11@monroecc.edu

Heather hpierce@monroecc.edu

Catherine cdubreck001@monroecc.edu

Geography

Geospatial Information Science and Technology (Gist)

Certificate Department of Chemistry and Geosciences

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