Integrating Education, Research and Development in Geospatial Information Technology at Southwestern Indian Polytechnic Institute

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What is Geospatial Information Technology?

- *The Science of “Where”*
- **Acquiring Spatial Data**
  - Global Positioning Systems (GPS)
  - Remote Sensing
- **Analyzing Spatial Data**
  - Image Processing
  - Geographic Information Systems (GIS)

**Communicating Spatial Information**
- Digital Mapping
SIPI Geospatial Information Technology (GIT) Program

AAS Degree • Certificate
GIS Job Listings on Oct. 26, 2019

USAjobs.gov
All states: 73

Indeed.com
AZ: 182
NM: 106
ND: 40
SD: 27
MT: 61
OK: 79
## Summer GIT Courses
Open to Tribal Employees & Tribal Members

<table>
<thead>
<tr>
<th>Dates</th>
<th>Course Number</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>May 13-17</td>
<td>GIT 101</td>
<td>Digital Cartography</td>
</tr>
<tr>
<td>May 20-24</td>
<td>GIT 111</td>
<td>Intro to GIS and GPS</td>
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<tr>
<td>June 3-7</td>
<td>GIT 121</td>
<td>Advanced GIS and GPS</td>
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<tr>
<td>June 10-14</td>
<td>GIT 202</td>
<td>Photogrammetry</td>
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<td>June 24-28</td>
<td>GIT 203</td>
<td>Remote Sensing</td>
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<tr>
<td>July 15-19</td>
<td>GIT 201</td>
<td>GIS and GPS Applications</td>
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<tr>
<td>July 29-Aug 2</td>
<td>GIT 290</td>
<td>Special Topics: Intro to Mapping with Small Unmanned Aircraft Systems (sUAS)</td>
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Summer GIT Courses
Open to Tribal Employees & Tribal Members

• 2020 Summer registration opens mid-March
• Info on SIPI website

https://www.sipi.edu/
SIPI Advanced Technical Education (ATE) Dept.

- Geospatial Information Technology (GIT)
- Natural Resources Management
- Environmental Science
- Pre-Engineering & CADD
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- Geospatial Information Technology (GIT)
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Research Project #1
Enhancing Native American Education and Land Management through Research, Collaboration and Training on Remote Sensing of Southwest Rangelands

Collaborators: SIPI (lead), NMSU, Pueblo of Isleta, UNM, USDA-ARS Jornada
Funding: USDA-NIFA Tribal College Research Area of Expertise (TCRAE)
Period: 2 yrs, 2019-2021

• Science
  • Satellite monitoring of grass forage conditions in Southwest rangelands
  • Data and information system for rangeland management

• Education
  • Engage students in research experiences
  • All majors are eligible

• Extension
  • Input from Tribes and other stakeholders on information needs
  • Share knowledge, methods and products
Rangeland Project Activities

- **Field Research**
  - Vegetation phenology
  - Handheld spectroradiometer
  - Portable multispectral imaging systems
  - UAV-based imaging

- **Lab Research**
  - Satellite image processing
  - Data analysis
  - GIS mapping

- **Training & Outreach**
  - SIPI students
    - summer course in desert ecology
    - mentoring by NMSU researchers
  - Tribes & other stakeholders
    - Consultation meetings
    - Workshops
Research Project #2
Developing a Multispectral Imaging System for Landscape Analysis and Monitoring

Funding: NSF Tribal College and University Program (TCUP)

- Advanced Technology
  - Scientific quality
  - Natural color, red, NIR, NDVI
  - Portable or fixed (phenocam)

- Interdisciplinary Collaboration
  - Hardware/Software: Engineering/CADD students
  - Applications: GIT, Nat. Res. Mgt, Env. Sci. students

- Extension
  - Share knowledge and tools
    - Tribes
    - Other TCUs
Conclusions

• Research ...
  • Enhances students’ educational experience
  • Promotes inter-program collaborations
  • Strengthens foundation for Extension

• Future Directions ...
  • Build on successes
  • Emphasis on precision agriculture and environmental monitoring
  • New training opportunities for Tribal communities
2019 National Tribal GIS™ Conference
November 18th - 22nd, 2019
Albuquerque, NM

Tribal GIS Event Brochure | Save The Date Card

Book Your Hotel Room

With Transportation or Without Transportation

**Register For The Conference Today**
Thank You