

## **Graduate Certificate in Geographic Information Science and Technology (GIS&T)**

CGS Agenda Item: 16-55 Effective upon IBHE approval
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### **Part 1: Catalog:**

**Name of Department:** Geology and Geography

**Title of Certification Program:** Graduate Certificate in Geographic Information Science and Technology

#### **Certificate Program Mission:**

The Graduate Certificate in Geographic Information Science and Technology (GIS&T) will serve students and career professionals in a broad range of disciplines with a foundation in GIS, Remote Sensing and related geospatial technologies sought after in today's workforce. Target disciplines will include agriculture, business, environment and urban planning, geography, geospatial intelligence and defense, medical, health and social services, information technology, transportation and other disciplines in which spatial planning and analysis techniques are employed. Through a combination of core courses, emerging technologies and electives, the certificate will allow individuals to be competitive in both the job market as well as in admission to higher-level degree programs.

#### **Certificate Admission Requirements:**

To be eligible for admission to the GIS&T Certificate Program, applicants must meet all of the requirements for admission to the Graduate School (see "Admission to Graduate Degree and Certificate Programs").

#### **Degree Audit:**

The graduate plan of study is the EIU Degree Audit, which is generated automatically in the Degree Audit Reporting System (DARS) at the time of degree or certificate candidacy. Modifications of the standard EIU Degree Audit are submitted by the graduate coordinator to the certification officer in the Graduate School at the time modifications are approved. The Degree Audit serves as an unofficial summary of requirements for the program. Degree and certificate candidates are advised to review the comprehensive summary of the Degree Audit process specified on the "Requirements for All Degree and Certificate Candidates" section of the Graduate Catalog. Individual programs may require candidates to submit plans of study in addition to the Degree Audit, candidates should consult with the program coordinator.

#### **\*Certificate Course/Curriculum Requirements:**

*A) GIS Core.*

*Students in the program must complete the following core courses (6 credits).*

- GEO 5810\* – Introduction to Geographic Information Science. Credits: 3
  - GEO 5880 – Geospatial Data Models. Credits: 3
- \* Students who have not taken an undergraduate course in GIS must complete additional training modules prior to or simultaneously with GEG 5810.*

*B) Remote Sensing Core*

*Students must complete one of the following (3 credits):*

- GEO 5820 – Remote Sensing I. Credits: 3
- GEO 5870 – Remote Sensing II. Credits: 3
- Both GEO 3820 & 3870, plus an additional 3 credits from group D (below)

*C) Emerging GIS Technologies*

*Students must complete one of the following (3-4 credits):*

- GEO 4910 – GIS Programming. Credits: 4
- GEO 5830 – Building Geodatabases. Credits: 3
- GEO 5850 – GPS: Mapping the Modern Way. Credits 3

*D) Electives*

*Students in the program must complete 6 additional credits of coursework from the following list of elective courses:*

- GEO 4910 – GIS Programming. Credits: 4
- GEO 5830 – Building Geodatabases. Credits: 3
- GEO 5850 – GPS: Mapping the Modern Way. Credits: 3
- GEO 5870 – Remote Sensing II. Credits: 3
- GEO 5990 – Independent Study
- BIO 4820 – Spatial Analysis for Environmental Sciences. Credits: 4
- BIO 4840 – Resource Management and Environmental Assessment. Credits: 3
- GIS 5970\* – Special Topics in GIS

*\* may be repeated for credit.*

*E) A maximum of 6 credits numbered 4750-5000 may be applied towards the degree.*

**Courses Applicable Toward a Specific Concurrent or Future Degree Program:**

Courses in the program may count toward any of the following Master's degree programs with permission of graduate students' committees:

- Professional Science Master's (PSM) in Geographic Information Science
- MBA with GIS Option

- Dual Degree option in GISci & Sustainable Energy
- MS in Technology – Resource Management

## **Part II: Rationale:**

### **Program Rationale and Justification:**

In 2011, Provost Lord established the EIU Geographic Information Sciences (GISci) center which was approved by the University Board of Trustees in January 2012. The mission of the GISci center is to provide students with an opportunity to attain a level of proficiency in GISci and to effectively merge into the professional and academic GISci community through a comprehensive and dynamic understanding of the methods and procedures necessary to perform advanced thematic mapping and spatial analysis across disciplines. The GISci Center with facilities in both Geology/Geography and Biological Sciences, provides the necessary hardware, software, geographic data, and methodological framework for the campus community. We have used the GISci Center as a locus for bringing GIS technologies into several Masters level degree programs (listed above) as well as two graduate certificate programs (Certificate in GISci – Biology, Certificate in Public Planning). However, the existing certificate programs are specific to the narrow disciplines of biology and public planning. In contrast, students from numerous disciplines including Geology, Geography, History, Engineering, Sustainable Energy and Sociology/Anthropology have taken at least one of the courses outlined above. Thus, there is a need for a general GISci Certificate Program to serve a broad range of disciplines and career objectives. Formalizing the GISci Graduate Certificate will provide an option for potential students from these and other disciplines to enroll in a graduate-level GISci training program that will enhance their career marketability. Specifically, the GISci Certificate will provide flexibility, allowing students to enroll in a certificate program with potential to continue into one of our several full Master's degree programs listed above.

**Impact on Existing Programs:** The GISci Certificate Program will provide another means for students from a variety of disciplines to take advantage of the graduate level courses already offered by departments associated with the GISci center. The GISci Certificate will not impact the existing GISci-related certificate programs at EIU (Certificate in GISci-Biology, Certificate in Public Planning), as students in these disciplines will be encouraged to enroll in the more narrowly focused disciplinary certificate programs. The GISci Certificate will positively impact the Masters degree programs associated with the GISci Center by providing a flexible pathway in which students can earn a certificate reflecting their GISci training on their way to a full PSM, MS or MBA Degree.

**New Courses Required for the Certificate Program:** No new courses need to be introduced in support of the GISci Certificate Program. Both Geology/Geography and Biological Sciences have the faculty to support the GISci Certificate Program.

**Number of Students Expected to Enroll Each Year:** Since Geology/Geography does not have a graduate program, enrollments listed below represent students from other academic programs including two programs in the Biology department (Masters Degree in in Biological Sciences, Graduate Certificate in GISci in Environmental Life Sciences) as well as the interdisciplinary Professional Science Master's (PSM) in GISci. Since the approval of the latter two programs in AY 11/12 and 12/13, enrollment in graduate-level GISci courses has more than doubled. It is expected that these enrollments will slowly increase over time with the GISci Certificate serving as a recruitment tool for Professional Science Master's degree program. Both Geology/Geography and Biological Sciences have the faculty to support the anticipated increase in enrollment.

Course #*	Course Name	AY 08-09	AY 09-10	AY 10-11	AY 11-12	AY 12-13	AY 13-14	AY 14-15	AY 15-16
GEG 4910	GIS Programming					5		6	
GEG 5810	Geographic Information Systems I**	7	6	4	17	10	11	5	16
GEG 5820	Remote Sensing I	2		1	3	4	1	11	7
GEG 5830	GIS: Building Geodatabases								4
GEG 5850	GPS: Mapping the Modern Way					1	2	5	
GEG 5860	Geographic Information Systems II		2	2	8	8	6	7	
GEG 5870	Remote Sensing II			1	2	1	3	3	3
GEG 5880	GIS Modeling							9	3
BIO 4820	Spatial Analysis for Environmental Sciences**	9			12	6	18		15
<b>TOTAL</b>		<b>18</b>	<b>8</b>	<b>8</b>	<b>42</b>	<b>30</b>	<b>46</b>	<b>40</b>	<b>54</b>

\* Courses equivalent to proposed certificate requirements. All GEG prefix courses are currently in the process of being changed to GEO prefixes.

\*\* Includes online sections offered as GIS 5970

**Department Contact:** Drs. Jim Davis (Chair) and Barry Kronenfeld (Graduate Coordinator)

### Part III: Approvals:

**Department/School Curriculum Committee:**  
**College Curriculum Committee:**

**Council on Graduate Studies:**