



SOUTHEAST MISSOURI
STATE UNIVERSITY · 1873

June 29, 2016

Angelette Prichett
Research Associate - Academic Affairs
Missouri Department of Higher Education
205 Jefferson Street
P.O. Box 1469
Jefferson City, MO 65102

Dear Angelette:

With approval of College Council, Academic Council, and the Board of Regents, Southeast Missouri State University is submitting the following proposal(s):

New Program

- Bachelor of Science in Geographic Information Science

Program Changes

- EDS Educational Leadership Development – Program Title Change to EDS in Teacher Leadership

The signed form(s) are enclosed. If you need any additional information or have any questions, please do not hesitate to contact me. Thank you for your assistance.

Sincerely,

Karl R. Kunkel, Ph.D.
Provost

Enclosure(s)



NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): Southeast Missouri State University

Program Title: Geographic Information Science

Degree/Certificate: Bachelor of Science

Options: N/A

Delivery Site(s): Cape Girardeau, Southeast Main Campus

CIP Classification: 45.0102

*CIP code can be cross-referenced with programs offered in your region on MDHE's program inventory highered.mo.gov/ProgramInventory/search.jsp

Implementation Date: August 2017

Cooperative Partners: N/A

*If this is a collaborative program, form CL must be included with this proposal

AUTHORIZATION:

Dr. Karl Kunkel, Provost

Name/Title of Institutional Officer


Signature

6-29-16
Date

Dr. John Kraemer

(573)651-2355

Person to Contact for More Information

Telephone

www.dhe.mo.gov • info@dhe.mo.gov

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STUDENT ENROLLMENT PROJECTIONS

Year	1	2	3	4	5
Full Time	10	15	20	20	36
Part Time	5	10	15	15	24
Total	15	25	35	35	60

Please provide a rationale regarding how student enrollment projections were calculated:

Student enrollment was based on the current enrollment of students taking geotechnical classes at the University and the projected needs derived from the Bureau of Labor and Statistics. No other state funded university has a BS degree in Geographic Information Science in Missouri, so we would also draw from a large pool of students in the state. There are limited opportunities to certificates or a Master Degree in Missouri.

Provide a **rationale** for proposing this program, including **evidence of market demand and societal need supported by research**:

Labor market experts predict that geospatial information scientists and technologists and remote sensing scientists and technologists will be a major source of new jobs over the coming decade. In addition, federal and state governmental programs and private companies are developing or have developed new employment opportunities for graduates from this major. The national market for these majors is expected to be 29% and 11% respectively (See Table 1). This growth is expected in the public and private sectors. In the private sector, students may find employment with top software development companies. Job activities range from designing desktop systems and implementing Web and mobile applications to developing workflow systems. Public sector job activities, such as with local or national governmental agencies, involve customizing desktop and project management systems as well as spatial models and systems, including both Web and mobile applications. (US Bureau of Labor and Statistics, 2015)

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Students in the GIS bachelor's program are well positioned to find high-paying jobs at private companies like Google, ESRI, GPS navigation software companies and software development companies, or with local or national government. Job activities will range from designing desktop systems, implementing web and mobile applications, and developing workflow systems. Public sector job activities involve customizing spatial models and systems for agencies such as the military or U.S. government, including web or mobile applications, customized desktop systems and project management.

Science, technology, engineering and math (STEM) jobs such as those using GIS are projected to grow twice as quickly as jobs in other fields, according to the U.S. Bureau of Labor Statistics. Similarly, **80 percent of jobs** in the next decade will require technical skills, such as those found in our GIS program.

Table 1. Percent Job Increases Over the Next Five Years and Median Salary.

<u>Geospatial Information Scientists and Technologists</u>	29%	\$81,140
<u>Remote Sensing Scientists and Technologists</u>	11.07%	\$91,640



PROGRAM STRUCTURE

A. Total credits required for graduation: 120

B. Residency requirements, if any: NA

C. General education: Total credits: 53

Courses (specific courses OR distribution area and credits):

Course Number	Credits	Course Title
UI 100	3	First Year Seminar
EN 100	3	English Composition
	3	Artistic Expression (see Undergraduate Bulletin for list of courses)
	3	Literary Expression (see Undergraduate Bulletin for list of courses)
	3	Living Systems (see Undergraduate Bulletin for list of courses)
	3	Oral Expression (see Undergraduate Bulletin for list of courses)
	3	Behavioral Expression (see Undergraduate Bulletin for list of courses)
MA 137	5	Logical Systems
	3	Physical Systems (see Undergraduate Bulletin for list of courses)
	3	Development of a Major Civilization (see Undergraduate Bulletin for list of courses)
	3	Economic Systems (see Undergraduate Bulletin for list of courses)
	3	Political Systems (see Undergraduate Bulletin for list of courses)
GG 150	3	Social Systems
	3	Written Systems (see Undergraduate Bulletin for list of courses)
IU 314	3	Interdisciplinary Studies
	6	One other UI 3xx and one UI 4xx

D. Major requirements: Total credits: 55

Course Number	Credits	Course Title
GO 110	3	Physical Geology
GO 340	3	Remote Sensing
GO 445	3	Geographic Information System
GO 520	3	GIS Application
AG 440	3	Precision Agriculture
AG 444	3	Spatial Analysis
IU 314	3	GeoInfo Science Today*
EV 425	3	GIS Planning for Emergency Response
MA 137	5	Precalculus*
MA 140	5	Calculus I
MA 138	5	Discrete Mathematics I
MA 223	3	Elementary Probability and Statistics
GG 150	3	Cultural Geography*
GG 445	3	Introduction to Computer Cartography
EV 483	3	Internship [#]
CS 177	3	Programming for Scientists and Engineers
IS 130	3	Application Development I
IS 175	3	Computer Information Systems I
IS 275	3	Computer Information Systems II
IS 330	3	Application Development II

* Courses with an asterisk are accounted for in the University Studies Hours

[#]AG 465 Internship may be taken in place of EV 483.

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E. Free elective credits: (Sum of C, D, and E should equal A.) 12

12 hours of electives are needed to complete the degree requirements. This offers students the opportunity to take additional courses in an area of interest (e.g., environmental science courses and GIS mapping for public health needs or anthropology courses and cultural mapping).

F. Requirements for thesis, internship or other capstone experience:

Students will be required to complete a three credit hour internship in the program.

G. Any unique features such as interdepartmental cooperation:

The proposed program will expand utilization of existing resources, such as the Center for Environmental Analysis. The Center has performed GIS-training to several municipality employees over the 10 years. In addition, the Center has performed numerous GIS mapping projects for public and private clients. These activities will create excellent future experiential learning positions for students in the new program.



PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name Southeast Missouri State University
 Program Name BS, Geographic Information
Science
 Date August 2017

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

1. Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.

No special preparation is needed.

- Characteristics of a specific population to be served, if applicable.

The new degree not only serves the general student population, but may be of particular interest to the computer science program. This degree program provides an opportunity for students to perform code development and the direct application of their work to applied science projects concurrently. This new field provides high paying employment opportunities to students wishing to develop and practice geographic information system work.

2. Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.

The multidisciplinary faculty expected to teach the courses included in the major have the appropriate degrees to instruct the required courses.

- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.

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All courses offered in this new program will be taught by full-time faculty. The courses included in this new major are offered as part of the regular teaching loads for the faculty in each of the colleges providing coursework to the major.

- Expectations for professional activities, special student contact, teaching/learning innovation.

The required face-to-face contact time is 45 hours per course. Instructors will use current simulations, case studies, and response templates to measure student learning and application techniques. In addition, instructors will be required to demonstrate effective teaching skills and quality applications of the materials.

3. Enrollment Projections

- Student FTE majoring in program by the end of five years.

A minimum of 60 students are expected to be enrolled by the end of 5 years.

- Percent of full time and part time enrollment by the end of five years.

60 % of the students will be full-time and 40% will be part-time students. The estimates for the number of students filling the full-time and part-time categories is based on the trend observed at the University as a whole (i.e., 75% full-time and 25% part-time) and the expectations that more majors will be non-traditional students or students working in the field.

4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.

As this is a four year degree program, we expect no graduates after three years; however, after five years of program operation we expect 15 graduates per year.

- Special skills specific to the program.

The skills developed in this program will include critical thinking, digital map development, quantitative assessment skills, and leadership skills to (a) respond to a range of uncertain, always-evolving urban and rural mapping complexities, (b) anticipate needs, evaluate alternative approaches and make critical decisions that facilitate “whole community” operations, and, (c) work within the boundaries of ethical, legal and regulatory limits.

- Proportion of students who will achieve licensing, certification, or registration.

All of the students who complete the major can qualify for a certificate in GIS Application offered by external agencies.

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- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.

There are no standardized tests for the degree; however, all students must perform with a minimum score of 75% to pass the FEMA certification exams.

- Placement rates in related fields, in other fields, unemployed.

Geographic Information Science is a growing field and many professional positions are found in government, private business and higher education. Due to the increasing demand for graduates with this degree, we anticipate high employment rates for our graduates.

1. Anticipated rate of employment in related fields (federal/state government and private companies) = 85-90%
2. Anticipated rate of employment in other fields (e.g., higher education) = 10-15%
3. Anticipated rate of unemployed or under-employed = 0%

- Transfer rates, continuous study.

We anticipate a very low rate of transfer from this program and a high rate of graduation for those who begin the program because this program is not offered at other Missouri Institutions of Higher Learning or nearby regional universities.

5. Program Accreditation

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. **If there are no plans to seek specialized accreditation, please provide a rationale.**

There is no institutional plan for accreditation since there is no national accreditation body for this type of program.

6. Alumni and Employer Survey

- Expected satisfaction rates for alumni, *including timing and method of surveys.*

To insure quality instruction, students will evaluate their instructors and experiential learning experiences at the end of each semester. Students will complete an exit interview after completing the degree requirements. Students will also be mailed a questionnaire one year and three years after graduation to assess course preparation and track employment. The expected satisfaction rate is 80-85%.

- Expected satisfaction rates for employers, including timing and method of surveys.

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A questionnaire will be developed to gather information about employers' perception of the program, suggestions for improvement and their overall satisfaction with graduates of the program. The questionnaire will be sent to employers 6-8 months after hiring the program graduate. The expected satisfaction rate is 80-85%.

7. Institutional Characteristics

- Characteristics demonstrating why your institution is particularly well-equipped to support the program.

Southeast Missouri State University will be the first publicly-funded institution in Missouri to develop a BS in Geographic Information Science. The Geographical Information Sciences degree is an interdisciplinary, interdepartmental program. It will be housed in the Environmental Science Program. The program is well established and is fiscally and pedagogically effective. The Environmental Science Program is also an interdisciplinary, interdepartmental program. This brings multiple science and sociological disciplines together to address policies. This characteristic allows the university to best address the educational needs of students who wish to pursue employment in the emergency management or planning sectors as GIS technology plays a pivotal role in these arenas. This new program would be an expansion of an already existing, successfully functioning interdisciplinary Environmental Science Program. In addition, the College of Science, Technology, and Agriculture offers courses and a minor in Applied Geographic Information System Technology. The existing GIS Minor Committee would provide support to the curriculum. Members of the Committee are from Agriculture, Criminal Justice, Environmental Science, Global Cultures and Languages, Historic Preservation, and Political Science.

The proposed new degree program is consistent with the University's Strategic Plan. The University has identified as an institutional priority "efforts to protect the environment" and this new program will assist the university to achieve that goal by providing graduates to our region capable of explaining environmental impacts from human and natural sources through detailed mapping and spatial analysis. In addition, the new program is a distinct application of technology into the curriculum and enables our graduates to begin careers in an expanding job market focused on technology use and development.

CITY of CAPE GIRARDEAU

OFFICE OF THE CITY MANAGER

Letter No. 16-47

June 22, 2016

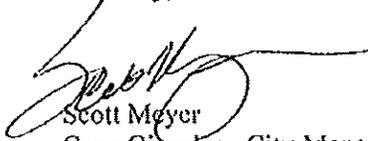
Dr. John Kraemer
Southeast Missouri State University
One University Plaza, MS 6200
Cape Girardeau, MO 63701

Dear Dr. Kraemer:

I am happy to provide this letter of support for the new Bachelor of Science in Geographic Information Sciences program at Southeast. This degree program will provide the background needed in solving logistic information challenges facing urban and rural development today. I look forward to seeing the incredible impact this program should have on filling regional and national employment needs.

Good Luck in this new endeavor!

Sincerely,



Scott Meyer
Cape Girardeau City Manager





Unilever
2400 Rose Parkway
Sikeston, MO 63801-7192
USA

Tel: 573 472 8400
Fax: 573 472 9549

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One University Plaza, MS 6200
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Philip Deuster