ATTACHMENT 1M-1

LETTER OF NOTIFICATION – 8

UNDERGRADUATE CERTIFICATE PROGRAM

(7-18 SEMESTER CREDIT HOURS)

1. Institution submitting request:
   University of Arkansas, Fayetteville

2. Contact person/title:
   Dr. Sharon Gaber/Provost

3. Phone number/e-mail address:
   479-575-2151/sgaber@uark.edu

4. Proposed effective date:
   Fall 2014

5. Name of proposed Undergraduate Certificate Program (Program must consist of 7-18 semester credit hours):
   Geospatial Technical Certificate

6. Proposed CIP Code:
   45.0702

7. Reason for proposed program implementation:
   The new certificate responds to the growing need for trained practitioners with demonstrated skills. The Department of Labor has identified this area as one of the three fastest growing job areas over the next decade. An extensive employer survey in the proposed program's service area has confirmed this demand. Additionally employers, especially county and local governments, in rural areas in Arkansas and surrounding states find it difficult to find qualified employees and the lack is holding back economic development.

8. Provide the following:
   a. Curriculum outline - List of courses in new program – Underline required courses

      GEOS 2003* Geospatial Technologies Mathematical Toolkit (3 credits)
      GEOS 2103* Geospatial Technologies Computational Toolkit (3 credits)
      GEOS 3543 Geographic Applications and Information Science (3 credits)
      GEOS 3553 Geospatial Analysis Using ArcGIS (3 credits)
      GEOS 3563 Geospatial Technologies Statistical Toolkit (3 credits)
      GEOS 3593 Introduction to Geodatabases (3 credits)

      *This course may be waived by means of successfully passing a proficiency examination.

   b. Total semester credit hours required for proposed program (Program range: 7-18 semester credit hours)

      18 hours are required for the certificate. If students pass proficiency exams for GEOS 2003 and GEOS 2103, those requirements may be waived.

c. New courses and new course descriptions

GEOS 2003 Geospatial Technologies Mathematical Toolkit (3 credits)
Basic mathematical tools applied in geospatial technology, including trigonometry in mapping, linear algebra in remote sensing, optimization in spatial decision support, and graph theory in routing. Course develops the framework for spatial data analysis and decision support. Students may receive credit for the course through testing.

GEOS 2103 Geospatial Technologies Computational Toolkit (3 credits)
Basic computational tools and processes applied in geospatial software, related computer hardware components, systems and applications software, and spatial database fundamentals. Python, including SciPy and NumPy, geospatial implementations will be emphasized. No programming experience is required. Students may receive credit for the course through testing.

GEOS 3553 Geospatial Analysis Using ArcGIS (3 credits)
Applications of analysis of spatial data using ArcGIS tools in map design, on-line mapping, creating geodatabases, accessing geospatial data, geo-processing, digitizing, geocoding, spatial analysis including basic spatial statistics, analysis of spatial distributions and patterning and 3D application using ArcGIS 3D Analyst.

GEOS 3563 Geospatial Technologies Statistical Toolkit (3 credits)
Basic statistical tools for geospatial technologies. Exploratory spatial data analysis, single and multivariate spatial analysis and hypothesis testing, Bayesian analysis, and spatial smoothing and interpolation. Emphasis will be on problem solving in geospatial settings using the R statistical language.

GEOS 3593 Introduction to Geodatabases (3 credits)
Fundamental concepts and applications of geospatial databases. Schema development and spatial data models for geodata. Spatial and attribute query and optimization, properties and structures of relational and object-oriented geodatabases. Spatial extensions of SQL, spatial indexing, measurement, and geometry.

d. Program goals and objectives

Two primary sources define the skills and technical content of educational programs in the geospatial area. These are the Department of Labor's Geospatial Competency Model (2011) and the University Consortium for Geographic Information Science's (UCGIS) Body of Knowledge document (2012). The Geospatial Technical Certificate is designed to provide the skills needed to effectively execute the responsibilities of the "mapping technician" and to also serve as foundational skills for additional education and advanced employment. It is expected that the students enrolling will be derived from three populations. Individuals already employed who wish to increase their skill sets in this area, recent graduates of associate degree programs from community colleges in the service area and undergraduates in institutions in the area who wish to develop these skills but do not have access to these educational opportunities.

e. Expected student learning outcomes

Students will be prepared to effectively perform the duties of the Mapping Technician as defined by the U.S. Department of Labor – specifically "mapping technicians assist cartographers in collecting data and making maps of the earth's surface. Mapping

technicians use geographic data to create maps". They will be able to perform the critical work functions defined in the US Department of Labor's Geospatial Competency Model's areas of: (a) Earth Geometry (b) Data Quality and (c) Geographic information systems.

    f.   Documentation that program meets employer needs

The U.S. Department of Labor has recognized geo-technology as one of the three most progressive professions today, alongside nanotechnology and biotechnology. Over 500,000 professionals are now being asked to use these methods in their jobs. The Bureau of Labor Statistics show that mapping technicians are experiencing faster than average employment growth - anticipating annual growth at 16-19 percent between 2008 and 2018 and that there will be "much faster than average" growth, in excess of 20 percent or more, in collateral jobs for which the certificate provides a foundations skill set. (Department of Labor 2010). Money Magazine and Payscale.com listed geographic information system analyst in its list of the "Top 100 Best Jobs in America" in 2010 and the 2011 list of the "Best Jobs in Fast-Growth Fields" includes various careers that utilize GIS. In the proposed programs primary service area (defined as encompassing the area from Kansas City KS to Jackson MS and Dallas TX to St Louis MO) that there were some 11,450 individuals employed as survey and mapping technicians. With the DOL's project growth an estimated 2,000 new positions will require new hires each year.

Note: As of 13 Sep 2013 an employer survey is currently in progress. Seven employer surveys have been received and more are expected before a summary is completed.

    g.   Student demand (projected enrollment) for proposed program

The GEOS department is currently offering one of these courses on-line GEOS 3543. Enrollment has grown from 20/academic year to 90/academic year (two offerings). We believe that an enrollment of 25-30 students is a conservative projection with the actual numbers likely to be substantially higher. Newly proposed online courses are also in demand by on-campus students who will have various options to utilize these in their existing programs of study.

    h.   Program approval letter from licensure/certification entity, if required

        n/a

    i.   Name of institutions offering similar programs and the institution(s) used as model to develop proposed program

        Pennsylvania State University

    j.   Scheduled program review date (within 10 years of program implementation)

        August 2022

9.   Institutional curriculum committee review/approval date:

10. Will this program be offered on-campus, off-campus, or via distance delivery? Indicate mode of distance delivery.

        Online via University of Arkansas Global Campus

11. Identify off-campus location. Provide a copy of email notification to other institutions in the area of the proposed off-campus program offering and their responses; include your reply to the

institutional responses.

n/a

12. Provide additional program information if requested by ADHE staff.

Initial course development will be funded by the UA Global Campus. Courses will be administered by Geosciences/ENDY PhD students with oversight by a UA Geosciences faculty member. PhD students will be funded by tuition earned from the on-line courses. A minimum enrollment of 20 students per course for each of the six courses will fund 2 PhD students each semester. No new faculty positions are required for the certificate program.

President/Chancellor Approval

Date: Board of Trustees

Notification Date:

Chief Academic Officer: Date: