

REVIEW OF

SPATIAL INFORMATION SYSTEMS  
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PROGRAM  
PROGRAM

UNIVERSITY OF ARKANSAS AT MONTICELLO

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Evaluator

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This report is the result of review of various documents submitted by the institution and the program including a program assessment self-study written by the program (dated 2011), a report completed by the UAM Program Review Committee (dated December 17, 2011) and various other UAM documents such as the institutional catalog and the institution's website.

The report addresses specific areas specified by the institution and ends with a general narrative in Section X that includes observations and recommendations. *Text in blue in serif font is taken directly from the specified areas and questions relating to them.* Text in black in sans serif font is the evaluator's responses, observations and recommendations.

## **I. Review of Program Goals, Objectives and Activities**

### **A. Are the intended educational (learning) goals for the program appropriate and assessed?**

Educational objectives are generally appropriate. More focus on the two options within the program is desirable. Dialog with professionals in industry is recommended before modifying them. (It is clear the objectives were written based on those of the forestry program; updated objectives that relate directly to the two options areas are recommended.)

Evidence was examined that demonstrates attention to the assessment of outcomes to determine if they are appropriate and that goals have been properly set. It appears that this process is in place and working although it could be improved in SIS. One clear way is to collect and collate graduate placement information and to assess progress in their careers at three to five year intervals.

### **B. How are the faculty and students accomplishing the program's goals and objectives?**

Attainment of objectives is exceptional. This was determined from the self-study report, interaction with the students, alumni, employers, faculty and staff. The students are, in general, happy with the program, graduates have reported excellent workplace entry and advancement, employers are so happy they keep coming back looking for more graduates, because they realize that it is not just the individual, but the quality of the program.

### **C. How is the program meeting market/industry demands and/or preparing students for advanced study?**

See B above. Preparation for advanced study was not directly researched through the site visit, however the school's assessment of its graduates indicates good preparation for advanced study. Faculty voiced this opinion in interviews. From student interaction and

review of student work, this evaluator found that they exhibit strong potential for success in advanced study.

#### D. Is there sufficient student demand for the program?

The self-study indicates strong data for uptake of graduates. The limiting factor is enrollment in the program. It is likely that if enrollment doubled or tripled that the graduates would continue to be all successfully placed at graduation or soon thereafter.

#### E. Do course enrollments and program graduation/completion rates justify the required resources?

Currently enrollment is low. It has been higher in the past (the program has only existed for twelve years). It does not appear that current enrollment rates are supportable over the long-term future. See observations and recommendations below on strategies for enrollment increase.

## II. Review of Program Curriculum

#### A. Is the program curriculum appropriate to meet current and future market/industry needs and/or to prepare students for advanced study?

Program curriculum is well suited to needs in industry. It is recommended that program faculty periodically review course content, teaching methodologies, equipment and software used, and even course titles to be sure that they are current. It is also recommended that this be done with an industrial advisory council. A simple example is a recommendation that the courses with "GPS" [for global navigation system] in their titles be revised to be "GNSS" [global navigation satellite system(s)] to reflect the increase in use by professionals of the Russian GLONASS and accelerating development of the European Galileo systems. This also expands the topic to include recognition of regional and SBAS systems such as WAAS, EGNOS, MSAT, QZSS, Gagan and Beidou/Compass.

#### B. Are institutional policies and procedures appropriate to keep the program curriculum current to meet industry standards?

- Program will be helped with better funding to keep technology (hardware and software) used in SIS to be more current. Fostering relationships with vendors is one way to ameliorate some of the difficulties, however a dedicated budget to anticipate and fill the need for gaps created by aging technology is recommended. A possible solution is to establish and generate funding for an endowment.

- Faculty reported difficulties for implementing industry standard practice of using a file transfer protocol (FTP) site or equivalent for transferring large imagery datasets (at the gigabyte or higher level). It is recommended that this gap be remedied.

### C. Are program exit requirements appropriate?

The capstone course has been put together with much thought about course learning objectives and student outcomes. In fact, all courses in the program pay attention to these learning objectives with a “do not pass GO” policy to ensure that when assessment of students occurs, program completion is assured on a course-by-course or semester-by-semester basis.

The curriculum that all students are required to complete is thorough and prepares the graduates well for job entry, job advancement and/or advanced studies.

### D. Does the program contain evidence of good breadth/focus and currency, including consistency with good practice?

In a word, yes. This is reinforced from the evaluator’s experience in industry and academia, evaluation of other programs. Most importantly, alumni and employers good reports serve as the best evidence, as described above in I.B.

### E. Are students introduced to experiences within the workplace and introduced to professionals in the field?

There are elements of the student experience that give them opportunities to interact with professionals at conferences. Some, but probably not enough, interaction with professionals occurs via the SIS Club. It is recommended that the program reach out more to practitioners, consumers of SIS data and information, government officials involved in licensure and other regulatory activities, and active members of professional societies. Additionally more incentives and encouragement should be offered to make student attendance at professional events possible. Negotiating with societies to get no cost or low cost memberships for the students and increasing the number of periodicals in the industry and academic press are some other ways to increase the opportunities and quality of this desired interaction.

### F. Does the program promote and support interdisciplinary initiatives?

Simply by being in the School of Forest Resources makes these students, from evaluator’s observations, better rounded than some students in similar programs across the nation. Especially in the area of the capstone class projects, the evaluator found interdisciplinary interaction...and not just at academic levels. An example is the project done to evaluate hot

spots for certain types of crime in a city. This required working with people and data from the justice system.

It is recommended however that outcomes directly pertaining to interdisciplinary activities and education be implemented following consultations with industry.

**G. Does the program provide respect and understanding for cultural diversity as evidenced in the curriculum, in program activities, in assignment of program responsibility and duties; in honors, awards, and scholarship recognition; in recruitment?**

Program does not reflect in the student body or faculty national trends for gender, cultural and ethnic diversity. It does not appear that there is any plan to exclude anyone; it may be a reflection of the region. However, the program cannot aspire to national or even statewide excellence, recognition and credibility without taking specific steps to market to prospective students and attract faculty of diverse backgrounds.

### **III. Review of Academic Support**

**A. Does the program provide appropriate quality and quantity of academic advising and mentoring of students?**

Course advisement is done by faculty associated with each of the options in SIS, as appropriate for the student. Other advising (academic, professional, career) is well done and often due to generally good and frequent interaction between students and faculty. Mentoring during the communications between faculty and students frequently occurs. Students are appreciative of this support they receive; they hold the faculty in high regard.

**B. Does the program provide for retention of qualified students from term to term and support student progress toward and achievement of graduation?**

Student progress is well monitored as reflected in responses to several of the above sections and are not repeated here. As this campus has an open enrollment policy, there is the likelihood of students who enroll in the program unsuited in temperament, interests, and abilities or ill prepared academically. Tutoring is available, when that is a solution through various departments including the School of Forest Resources. Remedial coursework that is likely to extend the period on campus or increase the credit-hour load is also possible. The campus, school and program offer a number of support options when these remedies are the appropriate response to a student in difficulty in the program.

## IV. Review of Program Faculty

### A. Do program faculty have appropriate academic credentials and/or professional licensure/certification?

Faculty are well grounded in professional practice, and do possess appropriate licensure or certification. For the most part, they possess advanced degrees. In the surveying area, the instructors do not have advanced degrees. This is a common problem—to find qualified faculty for this instructional area. The appropriate faculty at this institution has enrolled or is enrolled in advanced study programs that improve their depth, and can lead to advanced degrees. From review of the course materials, syllabi and discussions with students, alumni and employers, it is evident that the breath and depth of learning that occurs within the surveying option does not reflect any shortcomings due to the lack of advanced degrees among some of the faculty.

### B. Are the faculty orientation and faculty evaluation processes appropriate?

Faculty members are evaluated annually by the dean or departmental heads and by students. They are also evaluated during graduating student exit interviews. The assessment data indicates that faculty performing at less than par levels have eventually left the institution. These actions and outcomes indicate the effectiveness of the evaluation system.

### C. Is the faculty workload in keeping with best practices?

SIS is laboratory-intensive. Faculty workloads are difficult currently due to a resignation and a medical leave. When both these issues are addressed (a faculty member is being recruited at the time of this writing to address the resignation), it is likely that workloads will be appropriate to ensure a good experience for students and faculty.

## V. Review of Program Resources

### A. Is there an appropriate level of institutional support for program operation?

In addition to issues already addressed, faculty salaries appear to be low. While perhaps standard for the region, administrators, state executive and legislative branch leaders need to realize that competition is national or even worldwide. A commitment to excellence requires being competitive at the local, regional, national and sometimes international levels, depending on the availability of likely qualified candidates. Level and frequency of salary increases is a constant issue in the background...though it is a reflection of the current state

of the country's economy as well. An effort of the university wide administration to not pass on increases in health insurance premiums is appreciated by the faculty.

Functions such as information technology, computing resources and facilities (with the recent addition of a new building and renovation of existing structures) vary from very good to excellent.

## B. Are faculty, library, professional development and other program resources sufficient?

Faculty salaries, perhaps location can have a negative impact on new faculty. Library and other program resources are excellent to adequate. Professional development resources appear to be good.

## VI. Review of Program Effectiveness

### A. Indicate areas of program strength.

- Faculty knowledge
- Communications strength (faculty and students)
- Commitment to student needs
- Institutional resources such as IT
- Recent facility and infrastructure improvements at the school
- Successful placement and demand for graduates
- Integration with other disciplines within the School of Forest Resources

### B. Indicate the program areas in need of improvement within the next 12 months; over the next 2-5 years.

Areas of improvement in 12 months:

- Improve delivery of high tech resources such as providing a facility to the program to move gigabyte level datasets.
- Improve marketing for enrollment.
- Improve marketing for diversity (women and ethnic groups—national averages, or even campus averages place the program at low levels for diversity).
- Improve interaction opportunities between students and professionals.
- Add an industrial advisory council.

Areas of improvement in near to medium term:

- Prepare for and get ABET accreditation, this will improve campus and program credibility nationwide. In the evaluator's opinion the excellence observed in the program and the assessment improvements being planned makes achievement of

accreditation an accessible goal. ABET provides numerous resources including seminars and documents to help administrators and faculty understand the requirements and to build their program to achieve attainment of ABET accreditation criteria.

- Find ways to increase the program's visibility across the state so that it is not a regional program. A way to do this is to enlist aid of professional societies to do statewide outreach to high school students and counselors. Another way is to have a traveling recruitment program.
- Develop an alumni association/program to improve many facets including student interaction with professionals, better support (moral, student mentoring, program content improvement, financial), enhancement of marketing programs and improving general stature of the program across the state and the nation.

### C. Indicate areas for program development based on market/industry demands that have not been identified by the institution.

Some areas for improvement have been covered in II.A. Other areas to consider, although this is not intended to be a comprehensive list: close range photogrammetry, vision software, LiDAR (airborne and terrestrial), unmanned airborne systems in mapping and surveying. Not all these areas were explored with faculty...the list is based on report review only.

## **VII. Review of Instruction by Distance Technology (if program courses offered by distance)**

N/A

## **VIII. Review of Program Research and Service**

N/A

## **IX. Local Review Comments**

### A. How is the program meeting market/industry demands and /or preparing students for advanced study?

Covered in I. B. and II. D.

### B. What program modifications are needed?

Covered in II. A. and VI. C.



## X. Report Summary

### A. Include reviewer comments on the overall need for the program graduates/completers in the local area, region, and/or nation over the next 5 years.

Spatial Information Systems graduates, whether with the surveying or GIS option are likely to be in high demand nationally. One of the program's issues is dealing with the reticence of citizens of the state to come to Monticello if not from the region. Graduates exhibit a similar reticence to leave the Monticello region to pursue credible and lucrative opportunities that arise outside the region.

As the self-study report indicates, the demand is high and expected to increase. It will be up to the program, the institution, and the assistance the institution proactively gets from professional societies and individuals to overcome these societal and cultural issues that impede enrollment in the program and eventually, graduate uptake. So far, the aforementioned reticence has not been a problem...but it will become one if the enrollment does not significantly increase. In the evaluator's opinion a graduating class of 15 to 40 per year that is successfully placed is entirely possible between the two SIS options if these issues can be overcome even partially.

### B. Include reviewer comments on overall program quality, state program review process, etc.

The SIS program at UAM, regardless of option, is an excellent one. It fully deserves recognition and credibility, not just statewide, but nationally. It has a problem with being able to recruit students in numbers adequate to assure program viability. The employment potential is for a much higher number of students than is currently graduated.

This higher number (and inadequate diversity) problem can be addressed with good and efficient marketing. The program faculty is limited in available time to perform this function adequately during the school year. On marketing for the surveying option (and to some extent, the GIS option), the state society has helped recently by mailing Arkansas high school counselors information about surveying and the program. They have further indicated willingness to help by going so far as to visit high school students and counselors. During the meeting with alumni and employers, it was indicated (and indeed offered) that Arkansas surveying society officers are willing to call on their membership to assist in this program. All they require are some A/V materials and a script to follow that includes content as well as presentation (communication) tips.

It is likely that by building good relationships with GIS professional societies the same types of marketing strategies can be explored to market to potential students to enroll in the GIS option. The potential with GIS is stronger, as it can be argued that this the best program in

the state, although there are others. The surveying program has no competition in the state save a two-year program.

The national trend for gender, ethnic and cultural diversity is not visible in the program. The diversity reflected among the campus' students is not reflected in the student body and the faculty.

Improvements to the program, opportunities for student interaction with professionals, making the program relevant to society and the industry, and even marketing can all be improved by creation of an advisory council that explicitly serves the SIS program. The evaluator's meeting with alumni and employers clearly indicated a strong willingness and potential for program benefit by creation of such a group.

It appears that SIS outreach can be improved. There is a pent up demand for the professional continuing education that could be well addressed by the faculty. Service and entrepreneurial outcomes to meet the needs of stakeholders outside the academic community are not a high priority with the SIS program. While workload is an issue during the school year, creative use of time and resources during the summer months can improve faculty sharpness, make themselves and the program more visible, and provide real benefits to practitioners and secondary school educators across the state.

This program deserves more recognition and credibility. One way to do that is ABET accreditation. (ABET accredits engineering and applied science programs—surveying and mapping are applied sciences. It is recommended that the program, with the support of the School investigate requirements for ABET accreditation under the applied science accreditation commission (ASAC). In the evaluator's opinion, it will take very little to get the program to that stage. The evaluator has seen many other surveying and geomatics programs where the qualities of some of the elements observed were lower than the excellent qualities exhibited in the UAM SIS program. It will not take much to bring all aspects of the program up to par.

#### **ACKNOWLEDGMENT**

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