

PROGRAM REVIEW

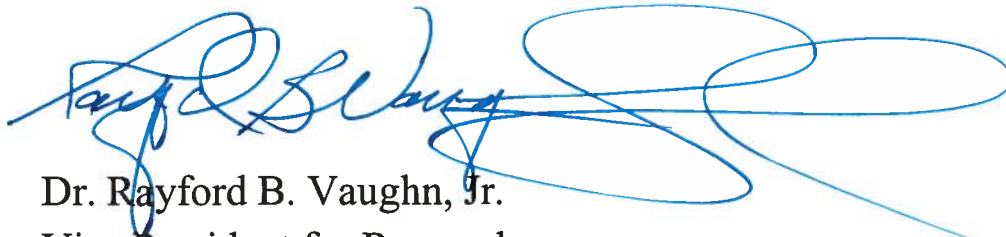
Dakota State University

**MASTERS OF SCIENCE IN INFORMATION ASSURANCE &
COMPUTER SECURITY (MSIA) – Graduate School**

**BACHELORS OF SCIENCE IN NETWORK & SECURITY
ADMINISTRATION (NETSEC) – College of Business and
Information Systems**

**ASSOCIATES IN NETWORKS & SYSTEM ADMINISTRATION
(NETSEC) – College of Business and Information Systems**

Review Conducted March 3, 2014 by:



Dr. Rayford B. Vaughn, Jr.
Vice President for Research
The University of Alabama in Huntsville

PART 1: Executive Summary

This program review was conducted on March 3, 2014 according to the schedule provided in this report. Overall, the program is healthy and has an outstanding national reputation for teaching information assurance skills to its students and is recognized by national level credentials. The faculty are exceptionally dedicated to this program and well qualified to deliver the technical material required. The facilities dedicated to these programs are adequate and the isolated laboratory used for student exercises (both on campus and distance) is exceptional. While the schedule did provide time for students to be interviewed by the evaluator, no students came at the scheduled time, so their comments were not included in this report.

Strengths of the reviewed programs which are noted in this report include the 4+1 Graduate program which allows students to obtain an MS degree in five years; the strong hands on components of the programs which gives students the opportunity to practice what they are taught in the classroom, the dedicated IA laboratory which represents a major capital investment by DSU, and the leadership role the DSU takes in the cyber security community through its hosting of the National Collegiate Cyber Defense Competition (CCDC) and its participation in National programs such as the Center of Academic Excellence program that the National Security Agency and the Department of Homeland Security oversee and the National Science Foundation's Scholarship for Service program which prepares students for government service as cyber security professionals.

Areas of concern that were shared with the administration include the extraordinary high teaching loads that the faculty are assigned, the lack of institutional support for research by the faculty, an apparent below average salary structure, a lack of recognition of the additional workload required of faculty with respect to teaching large numbers of distance students taking the same class as those on campus, and faculty retention. It appeared to the reviewer that the high teaching loads coupled with enrolment of distance and on-campus students together resulted in a less than optimal delivery of course material to the distance students. There was some concern also expressed by the faculty with respect to overlap between several degree programs being offered at DSU and not enough differentiation between them. Last, more assessment data needs to be collected on distance students' graduation rates and persistence in DSU programs.

The administration was also advised to reconsider the construction of a Special Compartmented Information Facility (SCIF) being considered and to perhaps opt for a modular, pre-constructed SCIF instead once commitment was obtained from a government sponsor to authorize classified research at the facility; to consider a name change from MS in Information Assurance and Computer Security to something that drops the Information Assurance term (perhaps consider Cyber Security); and, to form a committee to review the proposed Cyber Ops doctorate program and consider whether or not the program may be too narrow.

PART 2: SCHEDULE OF ON-SITE VISIT

Dakota State University

Institutional Program Review

M.S. in Information Assurance and Computer Security (MSIA)

B.S. and A.S. in Networks and Security Administration (NetSec)

Schedule of On Site Visit

March 3, 2014

- 8:00 - 8:45 Dr. Judy Dittman, Interim Academic Vice President, Heston Hall 314
- 8:45 – 9:30 Dr. Omar El-Gayar, Dean of Graduate Studies, Heston Hall 309
- 9:30-10:30 Dr. Tom Halverson Dean of College of Business and Information Systems
Dr. Wayne Pauli, Associate Dean of College of Business & Info Systems
Dr. Ashley Podhradsky, MSIA Program Coordinator
Kyle Cronin, Network Security Coordinator
Regent's Room
- 10:30 – 11:15 MSIA faculty, Regent's Room
- 11:15 - 12:00 Dr. Ashley Podhradsky, MSIA Program Coordinator, Regent's Room
- 12:00 – 1:00 Lunch with MSIA / Network Security faculty & Administration
- 1:00 – 1:45 Kyle Cronin, Network Security Program Chair, Regent's Room
- 1:45 – 2:30 Network Security Faculty, Regent's Room
- 2:30 – 3:00 Student Interviews, Regent's Room
- 3:00- 3:45 Carrie Ahern – Assessment Specialist, Heston Hall #309
- 3:45 – 4:00 Haomin Wang, Manager of Instructional Technology, Brinker Conference Room
- 4:00 – 5:00 Exit Interview, Brinker Conference Room
Dr. David Borofsky, President
Dr. Judy Dittman, Interim VPAA,
Dr. Omar El-Gayar, Dean of Graduate Studies
Dr. Tom Halverson, Dean of Business and Information Systems
Dr. Ashley Podhradsky, MSIA Program Coordinator
Kyle Cronin, NetSec Program Chair

PART 3: PROGRAM EVALUATION

1. Introduction: This document provides details concerning the program evaluation of three programs at Dakota State University conducted on March 3, 2014 by Dr. Rayford Vaughn, Vice President for Research at the University of Alabama in Huntsville. The three programs are the Masters of Science in Information Assurance & Computer Security (MSIA); the Bachelors of Science in Network & Security Administration (NETSEC); and the Associates in Networks & System Administration (NETSEC). In each of the major element of review below, all three programs are addressed within each topic. Overall, the program appears healthy and has an outstanding national reputation for teaching information assurance skills to its students and is recognized by national level credentials. The faculty are exceptionally dedicated to this program and well qualified to deliver the technical material required. The facilities dedicated to these programs are adequate and the isolated laboratory used for student exercises (both on campus and distance) is exceptional. While the schedule did provide time for students to be interviewed by the evaluator, no students came at the scheduled time, so their comments were not included in this report.

2. Program goals and strategic planning. The strategic planning goals for the MSIA and NetSec programs at DSU are being addressed effectively. These goals include continuing a strong hands-on aspect of education; delivery of students with strong technical skills; continuing an input stream of approximately 30 new students/year into NetSec and 15-20/year into MSIA. While not an immediate concern in the near term, there appears to be difficulty in developing additional faculty needed to grow the IA programs (this is addressed later in this report). Investment in the IA laboratory has been adequate in the past and the current laboratory resources are adequate to support both on-campus and distance students. It will be important in the near term to address refreshing the technology assets in this lab and to update its equipment. Current faculty are being given adequate additional technical training to keep current in the topics they are responsible to teaching. The goals for the program are appropriate – consideration could possibly be given to forming an IA faculty committee to address a tactical plan to implement and sustain the goals. If such a plan exists, it was not apparent to the reviewer. There was discussion of constructing a SCIF facility at DSU and the reviewer recommended against this unless specific written commitment to support by a government sponsor was received.

2. a. Program goals relative to institutional mission. DSU's current stated institutional mission is one of developing technology-based degree programs in information systems, business, teacher education, and allied health care services at both the undergraduate and graduate levels. This includes development of degree programs that integrate computers and information technologies into traditional academic subjects and coursework specific to the computer and information systems areas. In 2004, DSU received National level credentialing as a Center of Academic Excellence (CAE) in Information Assurance Education. This began the

focus in cyber security education and research activity and has progressed successfully to the current time. The development of the MSIA program in 2004 and the NetSec programs in 2010 are consistent with the DSU mission and emphasis areas.

2. b. Program goals relative to current national trends and forecasts for the discipline.

Cyber security is one of the fastest growing areas of instruction and research activity with the academic community and research sponsoring organizations. It is a national priority and the demand for graduates at all levels is far outpacing the numbers of students being produced with the relevant technical skills within academic institutions. This is particularly exacerbated by the need for U.S. citizens in many of these positions within government. The DSU student population is largely U.S. citizen and the MSIA and NetSec programs are aligned very well with the technical skills needed in this job market. DSU has developed a strong national reputation for the production of students with hands-on experience and technical expertise, the faculty appear to have strong technical backgrounds, and the curriculum appears to be appropriate. While the current national trend is for growth in the cyber security programs nationwide, it appears that the DSU program is leveling off in terms of its student enrollment in the MSIA and NetSec programs.

3. Program resources. Overall, the technical resources appear to be adequate for the current curriculum, distance students, on campus students, and faculty engagement. The cyber security laboratory is aging and consideration should be given to development of a plan for technology refreshment – particularly since this lab is heavily used by the distance student population. The lab administrator is currently devoting a significant effort to keep the laboratory up and running. While this reviewer was on campus, the laboratory crashed and the administrator was not able to demonstrate remote connectivity. The administrator is a highly competent and dedicated individual and essential to the functioning of this lab.

3.a. Effective use of resources to meet program goals. No significant concerns were noted here. The resources currently available to the faculty and students appear to be fully used and adequate. The review did, however, identify improvements that could be made in distance delivery of technical courses. Currently it appears that DSU simply records and digitizes classroom lectures while delivering those to on campus students. Off campus distance students then watch the digitized version and interact with the faculty member primarily by email. While this process seems to work, it is not the most efficient way to deliver distance learning courses. It also appears that very little use is being made of the Instructional Technology organization in designing course modules for distance students. Consideration should be given to designing courses specifically for distance students which could be used over several semesters and updated as necessary. Such courses would be comprised of shorter modules or pod casts with periodic assessments being required to determine if the distance student was mastering the material. DSU faculty believe that they are not being given adequate teaching credit for having to combine on campus and off campus distance students in the same class. Such classes count as one course delivery. An argument could be made that these are actually two courses and

require different levels of activity and engagement for the faculty member. While the initial effort to create separate on line courses might be significant – the repeated use of such courses would likely be less burdensome on the faculty and more interesting to the distance students.

3.b. Faculty -- staffing levels and credentials. Faculty teaching loads are very high. In the reviewer's opinion, the faculty are being asked to teach too much at the sacrifice of their ability to conduct any meaningful research or to pursue funding from external sources. Faculty reported being assigned 4 and 5 classes per semester. It was also clear that several very good faculty members had chosen to leave DSU and the faculty seemed to believe it was primarily due to the teaching workload and lack of research time. This seems to result in many of the current faculty being graduates of DSU or Capella and difficulty in attracting faculty from more highly rated universities. Additionally, the consensus among faculty that interacted with the reviewer was that salaries were not competitive at DSU. This review did not include salary information, so this is reported as an observation that might deserve further investigation and/or consideration. The reviewer was also informed by the faculty that the DSU tenure and promotion process heavily valued research productivity which seemed inconsistent with the exceptionally high teaching loads that the faculty are assigned.

3.c. Classroom facilities. Classrooms are modern and most certainly adequate for the student's use. No concerns with respect to classroom facilities were noted, observed, or discussed with the faculty.

3.d. Laboratory facilities and equipment. As previously noted, the information assurance Lab is a unique facility and heavily leveraged for course lectures, in-class exercises, out-of-class assignments, research projects, and team projects. DSU has invested over \$200,000 in hardware and software to support virtualization of the IA Lab, but this investment is showing its age and technology refreshment will soon be needed. The lab allows for hands on learning methodologies to be deployed through the classroom by conducting labs with: password cracking, network scanning, website hacking, firewall administration, and incident responses as part of the NetSec program. The IA Lab is used frequently by distance education students, partner institutions, and high school events from remote location to provide a "sandbox" environment where technical security exercises and research can be conducted. This environment has the same end-user experience for all students, on campus or online. The use, maintenance, and administration of this lab is noteworthy. Future plans include moving into a renovated Madison Community Hospital building in fall 2016.

3.e. Financial support. No particular issues were identified in the area of financial support other than technology refreshment needed in the IA laboratory and faculty indications that their salaries were not competitive. The program review did not include faculty salary data, so this concern was not further investigated. Student financial support programs were available and a strong cyber security scholarship program was in place (NSF SFS program).

4. Program curriculum. While there is no defined curriculum nationally for cyber security studies, the MSIA and the NetSec program curricula appeared perfectly reasonable and frequently reviewed. The speed at which courses and curriculum were reviewed and modified at DSU was noteworthy. There were concerns expressed by some faculty that curriculum change occurred so rapidly, that on occasion, it confused the students and made advising somewhat difficult. Concern was also expressed by the faculty that the new Cyber Ops doctoral program was too narrow in focus and perhaps consideration should be given to a broader term for the degree – e.g., Cyber Security. The specialization tracks for the MSIA (Banking and Financial Security or General Specialization) did not really seem to be specializations at all in that there is only a three courses difference between the two tracks. In fact, a student in the general specialization track could select one or two of the Banking and Financial Security courses and make the difference between the two tracks even less significant. It is recommended that a faculty committee be formed and chartered to review the fit between all the IA programs at DSU and asked to make recommendations on curricula change. This review should consider all the IS, IA, and Cyber courses. The 4+1 Graduate program started in 2011 seems to be very popular and is an excellent program in the reviewer's opinion.

5. Technology integration. The three programs reviewed make heavy use of DSU's Information Assurance (IA) lab. Essentially all courses in the programs leverage the resources available in the IA lab. This facility allows all students (on campus and distance) to complete hands on labs in an independent fashion without interference. DSU also has sufficient and modern equipment assets in its digital forensics program such that students are gaining experience with state of the practice hardware and software. The computer infrastructure seems very satisfactory and no concerns were expressed with the infrastructure or the supporting IT staff support.

6. Program assessment. The reviewer met with Ms. Carrie Ahern, assessment specialist at DSU. The assessment criteria for the MSIA and NetSec programs are all available on an assessment web sites at <http://www.dsu.edu/academics/assessment/academic-assessment/major-field-undergrad-table.aspx> and <http://www.dsu.edu/academics/assessment/academic-assessment/major-field-grad-table.aspx>. The assessment plans and assessment data are appropriate, relative to program goals, and supportive of accreditation. The assessment data does not include specifics on distance students such as graduation data, how many take one or two courses and simply transfer them to another school, how many actually complete the program, etc. Such assessment data might be helpful in understanding the best way to deliver distance course material and perhaps in making funding arguments to South Dakota government authorities. Overall, the assessment data was well structured, easily accessible, and very transparent. The collection of data following the assessment plan was noteworthy. Ms Ahern noted no problems in collection or cooperation on the part of the faculty in collecting assessment data.

7. Student support / student enrollments. No students were interviewed during this review – time was scheduled for student interviews, but none showed up at the appointed time. However, reviewing data provided in the self-study document provided sufficient evidence that enrollment numbers are adequate and reasonable. Students are recruited through website efforts, local advertising, and (in the opinion of the reviewer) from a national reputation that DSU has developed in the area of Cyber Security. Academic advising by the faculty is structured, consistent, and managed very well by program coordinators. Graduation rates seem reasonable given the enrollment numbers provided. As previously stated – graduation rates for distance students did not seem to be available and would be worth collecting and tracking. Persistence and retention rates were provided in the self-study document and were excellent. Student support services were not reviewed during the on-campus time, however, no complaints or comments were received in this area from the faculty or administrators.

8. Program strengths and areas for improvement.

Strengths include the following:

- Very dedicated, hardworking and technically competent faculty.
- Strong laboratory facilities
- Hands-on exercises for students integrated into all classes
- Strong distance learning participation
- Very good assessment program
- National credentials

Areas for improvement include:

- Need for teaching load reduction to accommodate research time
- Structure distance learning modules using more modern techniques rather than simply recording lectures and posting them on a web site.
- Assessment data should include graduation rates, persistence, and retention of distance students separate from on-campus students.
- Consider changing the name of the MSIA program to MS Cyber Security (a more current term)
- Consider forming a faculty committee to look at overlap/duplication between various IS/IA programs
- Faculty diversity appears to need improvement – female and minority populations are weak.
- Consider technology refreshment in IA laboratory

9. Specific issues identified by the university: program curriculum, program assessment, and program enrollments. No specific issues were identified by the University prior to the visit.