MASTERS OF SCIENCE IN INFORMATION ASSURANCE & COMPUTER SECURITY (MSIA)

BACHELORS OF SCIENCE IN NETWORK & SECURITY ADMINISTRATION (NETSEC)

ASSOCIATES IN NETWORKS & SYSTEM ADMINISTRATION (NETSEC)

PROGRAM REVIEW

College of Business & Information Systems

Dakota State University
February, 2014

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Part 1: Institutional History

Heritage: 1881-1982

Dakota State University was established in 1881 as the first teacher education institution in Dakota Territory. Teacher education remained the primary mission of the institution through the 1950s. However, in response to the changing needs of South Dakota in the 1960s, the university began to expand its role to include degree programs in the liberal arts and business.

In 1980, South Dakota welcomed a major new industry into the state: the banking and credit card industry. The success and growth of this new industry, as well as the success of other information-oriented, computer-based industries in the state, prompted the state's leadership to carefully examine the degree programs being offered at the public institutions of higher education within the state. After lengthy discussions, leaders in state government, the banking and information services industries, and the Board of Regents agreed to develop new degree programs at one institution and then to use the experience and knowledge from this development to expand programs throughout the state's public higher education system.

Mission Change: 1983-84

In 1984, the Legislature of the State of South Dakota (South Dakota Codified Law 13-59-2.2) assigned Dakota State University the role and mission of developing technology-based degree programs in information systems, business, teacher education, and allied health care services at both the undergraduate and graduate levels. The Legislature provided $2.6 million in additional operating funds to support a three-year mission change at DSU. During the initial phase of the transition, the academic programs of the institution were reviewed. Degree programs were phased out if they were duplicated at the other five Regental institutions or if graduates would enter an over-supplied marketplace. New information systems programs, computer equipment, and facilities were approved for DSU. During the transition, special attention was given to ensure that all students in programs slated for phase-out received a full opportunity to complete those programs. To ensure the continuation of education quality, when the number of students continuing in a program became very small, a special faculty-mentoring program was developed.

The second phase of the transition began in August 1984, with the development of degree programs that integrated computers and information technologies into traditional academic subjects and added coursework specific to the computer and information systems areas. Existing faculty were retrained, and new faculty were hired. Programs to implement the research and service aspects of the new role and mission were started. This was a period of stress for the campus, but it was also a period of great exhilaration with faculty and staff invigorated and renewed by the need for innovation, adaptation, and change. Some faculty and staff were unable to adapt to the changing conditions and left the university, but those who stayed on for the ride were justly proud of their accomplishments.

Realizing that the innovative programs being developed at DSU were expensive, private industry and state government provided the university with additional financial resources. Consultants from state agencies and from national corporations also provided assistance and guidance that contributed greatly to the success of the mission change.

Since the Mission Change: 1984-Present

Today, the institution remains focused on the mission adopted in 1984. The curriculum in established degree programs is carefully scrutinized each year to ensure that it remains on the cutting edge relative to technology. When new degree programs are proposed by the colleges, they must clearly satisfy the "Is it compatible with our mission?" question before any additional planning is done. Improvements in equipment and facilities continue to be a high priority in the institution's agenda. The institution initially provided training in both mainframe and desktop computing. In recent years, the emphasis switched first to desktop computing and more recently to encompass wireless, mobile, and tablet computing. With the addition of degree programs that emphasize information assurance and security issues, additional computer lab facilities have been added to the campus infrastructure.

Prior to the mission change, most DSU students lived within a 50-mile radius of the campus. Most were traditional students coming to the institution directly from high school. Since the mission change, the DSU audience and student population has changed markedly. Immediately after the mission change, enrollments plunged from 1,246 to 867 in two years – a frightening 27.6 percent decline the first year, followed by another 12.6 percent decline the second year. But the new curriculum changes, combined with new institutional vigor, provided the institution with unprecedented enrollment growth and stability. Since that rather rocky start, the institution's enrollments have climbed, reaching 3129 in Fall 2013 (1740.6 FTE).

In 1999, the Higher Learning Commission of the North Central Association of Colleges and Schools (NCA) approved DSU's request to add its first graduate program, a Master of Science degree program in information systems, to the curriculum. In 2000, a master of science in education degree program in computer education and technology was also approved by the Higher Learning Commission. (The program name for the Master of Science in education degree program has since been changed to educational technology.) In 2004, the Master of Science in Information Assurance & Computer Security was approved. In December 2005, the South Dakota Board of Regents authorized DSU to offer its first doctoral degree, a doctorate in Information Systems. The Master of Science in Health Informatics was approved in 2009 with the Master of Business Administration program getting approval in 2011. Of the 3,129 students enrolled at DSU in fall 2013, 2,876 students were enrolled at the undergraduate level; another 253 students were enrolled at the graduate level. This number reflects both degree-seeking students and special (non-degree seeking) students.

Throughout its 131 years, Dakota State University has had a proud heritage of preparing graduates to meet the needs of a changing society. Since 1881, the university has provided challenging academic programs in one of the best educational environments in the state. The continuation of this tradition of service is of prime importance to the faculty, students, staff, and administration of Dakota State University.

Accreditation History

Dakota State University was granted accreditation by the Higher Learning Commission for a period of ten years in 1961 and accreditation has been continued after each comprehensive visit. Since being accepted into the Higher Learning Commission's (HLC) Academic Quality Improvement Program (AQIP) in February 2005, DSU has participated in two strategy forums (November 2005 and February 2010), a systems appraisal in 2008-09 and again in 2012 and a Quality Check-Up Visit in October 2010. On February 20, 2011, the HLC's Institutional Actions Council (IAC) voted to continue the accreditation of Dakota State University through the AQIP process with the next reaffirmation in 2018-19.

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Dakota State University (DSU) has been a Center of Academic Excellence in Information Assurance Education (CAE-IAE) since 2003 and a Center of Academic Excellence in Research (CAE-R) and a Center of Academic Excellence in Cyber Operations (CAE-CO) since 2012. DSU offers both graduate and undergraduate degrees in Information Assurance (IA) with 350+ students currently studying in the Bachelors of Science in Computer and Network Security (NETSEC) and Computer Science (CS) programs in addition to the Masters of Science in Information Assurance & Computer Security (MSIA) and Masters of Applied Computer Science (MSACS).

DSU recently created a "4+1" program that allows high achieving students to earn both an undergraduate and graduate degree in five total years. DSU is a national leader with its hands-on IA Lab to support both on-campus and distance education students in the NETSEC and MSIA programs. This Lab supports 100 concurrent on-campus students and 500 concurrent distance education students. The IA curriculum at DSU emphasizes teaching the same techniques used by attackers today.

Since 2005, DSU was awarded grants from NASA, the Department of Education, the Department of Defense, and the National Science Foundation to research in Information Assurance.

History of the University

- 1881: Dakota Normal School established by the Territorial Legislature.

- 1947: Name changed to General Beadle State Teachers College.

- 1969: Name changed to Dakota State College.

- 1984: SD Legislature mandated mission change at Dakota State. The new mission integrated technology across all areas of the curriculum.

- 1989: Name changed to Dakota State University.

- 2004: DSU goes wireless with tablet computer initiative. DSU is named Center of Academic Excellence in Information Assurance Education (CAE-IAE) by the National Security Agency and the Department of Homeland Security.

- 2012: DSU is named Center of Academic Excellence in Information Assurance Research (CAE-R) by the National Security Agency and the Department of Homeland Security.

- 2012-2013: DSU is named Center of Academic Excellence in Cyber Operations (CAE-CO) by the National Security Agency.

Mission of the University

The mission of Dakota State University as it appears in the Board of Regents Policy Manual (1:10:5, adopted 08/07) states:

"The Legislature established Dakota State University as an institution specializing in programs in computer management, computer information systems, and other related undergraduate and graduate programs as outlined in SDCL § 13-59-2.2. A special emphasis is the preparation of the elementary and secondary teachers with expertise in the use of computer technology and information processing in the teaching and learning process."

The Board implemented SDCL § 13-59-2.2 by authorizing undergraduate and graduate programs that are technology-infused and promote excellence in teaching and learning. These programs support research, scholarly and creative activities and provide service to the State of South Dakota and the region. Dakota State University is a member of the South Dakota System of Higher Education.

College Mission Statement

"The mission of the College of Business and Information Systems is to educate and prepare students to be life-long learners and professionals in business, computer information systems, electronic commerce, computer science, business and computer education, and health information management.

We will accomplish our mission by challenging students to build a solid base of knowledge in their chosen fields, to develop excellent information management skills, to think logically, and to make sound decisions."

History of the Programs

The information assurance or security programs at Dakota State University have gone through significant changes in the previous 12 years. Currently, we have the Network and Security Administration program (NetSec) that is somewhat based on the old Computer and Network Security (CONS) degree and the old Network and System Administration degree. Security was originally considered in DSU coursework in 2001 as part of the Computer Information Systems (CIS) B.S. degree. In 2002, the security coursework was integrated in to the Internet & E-Commerce B.S, and in 2003 the security degree became the E-Commerce & Network Security B.S. Finally, in 2005 the security program became the Computer & Network Security B.S. degree that was most recently offered. Naturally, the program's focus has shifted during this timeframe to reflect the current security topics of the degree. From 2001-2003 the focus of the security program emphasized how security topics should be integrated into already established client-side and server-side software packages as part of the CIS degree. From 2003-2005 the emphasis was how security relates to e-business and e-commerce, and then a broad security degree touching many of the ten CISSP domains starting in 2005. In 2008 the emphasis of the CONS degree was directed to one of a technical, hands-on security program that is a top 10 undergraduate security program in the nation judging by our involvement in faculty development grants and workshops in the last three years. The CONS program continued to push closer to Computer Science to gain even more technical fundamentals from core Computer Science courses, while Network and Security Administration included focuses in networking and system administration.

The Masters of Science in Information Assurance & Computer Security (MSIA) program was started in 2004 and has followed the same lifecycle as the NetSec program. This program currently has a technical security component via its General specialization as well as a banking & financial infrastructure protection emphasis via its Banking and Financial Security specialization. These specializations provide options for students to follow a technical or managerial path to security.

The Bachelors of Science in Network and System Administration (NSA) started in 2010 as a stand-alone degree after several years of being a strong interest area of faculty and students alike in the CONS program. The first group of students are now passing through the upper-level coursework and had sizable graduation numbers in spring 2013. The original Bachelor degree of Network and System Administration was merged with CONS in 2013 to produce the current Network and Security Administration (NetSec) program. The degree program is intended to provide graduates with a strong background in computer networking theory, TCP/IP based networks, information security, computer forensics, network operating systems, mission-critical applications (e.g., electronic mail systems), virtualization/cloud computing, and computer and network security. Graduates will have the skills necessary to manage the information technology infrastructure required to operate a modern business, with job titles that include as system administrator, network system engineer, systems analyst, network analyst, network application developer, and technical consultants. In addition, these DSU graduates will have a solid business communication background, which enables them to effectively correspond with and support the various operational units within a business organization. The employment outlook for networking professionals is strong as companies continue to build up and update their network infrastructure.

Part 2: Trends in the Discipline

The demand for skilled security graduates around the world continues to increase. Current business trends have found the value of implementing highly secure environments and leveraging the cost savings of cloud computing. These trends tie in closely with the NetSec degree's technical offerings, which strongly emphasize hands on learning methodologies. In meeting with demands, the skillsets include: deep packet analysis, routing and switching, secure web application assessment, digital forensics, network security assessment, and incident response. These trends are exhibited by businesses of all sizes and types, ranging from small businesses employees to large scale enterprises with thousands of employees distributed globally. Aside from a demand in a diverse size, trends show strong demand for technical security professionals in state and federal governments, financial services, and health care to help protect the confidentiality, integrity, and availability of sensitive information.

Starting in 2009, DSU faculty in the security programs attended several faculty development offerings at other universities around the nation. In 2010, these faculty members also started attending technical security sessions provided by professional trainers and security professional from industry to gain knowledge and skills that were lacking at the faculty development level. These advanced technical trainings are critical to keep the DSU NetSec program as a national leader in technical security education. DSU takes great pride in providing many meaningful initiatives on campus for students and faculty, which are summarized in the following list.

- **4+1 Graduate Program:** Started in January 2011, DSU is offering an advanced academic program that allows students to earn both an undergraduate and graduate degree in a total of five years. Students admitted to the 4+1 program must have a 3.2 cumulative GPA and be within one academic year of earning his/her Bachelor's degree. These students use the last semester of undergraduate studies and then immediately following graduation to take Masters coursework in the MSIA degree.

- **Technical Hands-on Exercises Integrated in all Courses:** Every 200, 300-level and 400-level course in the NetSec degree and every course in the MSIA includes 50% hands-on exercises to augment the learning experience for our students. This emphasis on laboratory exercises has been a byproduct of Student Opinion Surveys completed during past 4 years in which over 90% of students indicated they learn more with hands-on exercises.

- **Dedicated Information Assurance (IA) Lab:** DSU has an IA Lab that is leveraged heavily for course lectures, in-class exercises, out-of-class assignments, research projects, and team projects. Since 2008, DSU has invested over $200,000 in hardware and software to support virtualization of the IA Lab. These capabilities allow 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 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.

- **National Collegiate Cyber Defense Competition (CCDC) Regional Host:** DSU is the host of the North Central Region of the CCDC which provides a 2-day competition in defensive network procedures and completing business tasks for colleges and universities in South Dakota, Nebraska, Iowa, North Dakota, Wyoming, and Montana. The North Central Regional CCDC is held every spring with the winning institution advancing to the National CCDC as one of nine National competitors.

- **Student Research Initiative:** DSU offers the Student Research Initiative (SRI) annually to students to generate excitement about and opportunity for undergraduate students to take part in applied

research. SRI applicants must gain approval from a supporting faculty member and work closely with this faculty member throughout the academic year to complete the research project. The NetSec and MSIA programs have historically had 2-5 SRI projects each year. Projects for the most recent academic year include: 1) Cloud Computing Security; 2) Honey Pots to Attract Hacker Behaviors on Un-patched Computers; 3) Session Identifier Generation Prediction; 4) Malware Cataloging and 5.) Digital Forensics and Xbox 360's.

- **Internships:** A number of NetSec and MSIA students choose to complete an industry-level internship during summer months. Most students complete a more generalized internship after their 2nd year in the program after completing foundation courses in web programming, C programming, and networking. NetSec students complete the NetSec core, a collection of four security-intensive courses, during their 3rd year in the program. After completing this NetSec core students are well-prepared to complete a security-specific internship after their 3rd year.

- **Current Partnerships with Other Institutions:** Dakota State University currently partners with the University of Texas – San Antonio to host and administer the North Central region of the Collegiate Cyber Defense Competition (CCDC) with funding made available by the Department of Homeland Security (DHS).

Part 3: Academic Program and Curriculum

Masters of Science in Information Assurance & Computer Security

Mission Statement

The Master of Science in Information Assurance & Computer Security (MSIA) prepares graduates to protect an organization's information assets. It educates graduates in advanced technology, security, and implementation issues. The Master of Science in Information Assurance and Computer Security (MSIA) Degree is designed to prepare professionals who will have the skills to:

• Develop and implement security strategies to improve the security posture of organizations

• Provide technical leadership for the organization's efforts to adopt new technologies, implement security strategies, and protect organizational assets against attack.

Academic Degrees

Master of Science in Information Assurance and Computer Security

Curricular Options

• Banking and Financial Security: This specialization is a "managerial" track which includes components such as risk management and policy making.

• General: This specialization is a "technical" component that involves practical courses with labs, and computer science related courses such as software security and cryptography.

Differences among the Programs Being Reviewed

• MSIA is at the graduate level, while NetSec is at the undergraduate level.

• MSIA focuses solely on computer security and information assurance from an advanced theory and applied perspective. The MSIA degree offers students additional exposure to academic research. NetSec, both the AS and BS, are traditional undergraduate programs with an applied focus.

Comparison of the Program with Other Regional Programs

• MSIA has two intensive tracks including a technical and a managerial track. The dual nature of the program provides the students with a unique opportunity when compared with other regional schools which only focus on one specialization. For example, the MS in Security Technologies offered at University of Minnesota, Twin Cities only focuses only on risk management and policy making.

• In comparison to programs at other universities (e.g. MSIA at University of Nebraska at Omaha), we have much more intensive, hands on driven course work, especially in the technical track. We offer wider variety of courses including several that are unique to our program. These topics can include: forensics, software security, cryptography, advanced exploitation, web hacking, and others.

• Our students are well-prepared to obtain industry certifications such as CISSP (a highly rated industry standard certification), immediately upon graduation, since we ensure that we cover all the common bodies of knowledge outlined in CISSP carefully in many courses. We also design our assessment exam

at the end of the MSIA program using a pattern and question set which pull from each of the 10 common security domains.

- We have both an on-campus and on-line delivery methods, as opposed to some universities that offer only one mode.

Special Strengths and Unique Features

- The standards set by the National Security Telecommunications and Information Systems Security Committee of the National Security Agency (known as NSTISSI 4011) have been used as the model for the development of DSU's MSIA program. The computer science and security courses offered by Dakota State University have been certified as a 100% mapping to the Committee on National Security Systems (CNSS), National Standards 4011 and 4013. This certification is made by the Information Assurance Courseware Evaluation (IACE) Program, part of the National INFOSEC (Information Security) Education and Training Program administered by the U.S. National Security Agency.

- It has two major tracks: Technical and Managerial, as opposed to many MSIA programs nation-wide.

- A heavy hands-on approach to practice all the practical aspects of computer security both on-campus and at a distance.

- An excellent track record of students being well-placed in industry upon graduation (companies include CitiBank, WellsFargo, Secure Banking Solutions).

- Strong ties to the NSF funded Scholarship for Service (SFS) grant with $1.3M funding and the 2010 research center with $2M. Some students receive assistantships to support their education through these grants.

Student Progression

- **Core courses:** INFA 701 Principles of Information Assurance, INFA 713 Managing Security Risks, INFA 715 Data Privacy, INFA 721 Computer Forensics, INFA 734 Web Software Security, INFA 736 Offensive Network Security, and INFS 754 Network Security/Intrusion Detection. All core courses are 3 credits.

- **Specialization I - Banking and Financial Security**

  INFA 741 Introduction to Banking, INFA 743 Information Security Management Systems, INFA 745 Compliance and Audit. All courses are 3 credits.

- **Specialization II – General Specialization**

  Students select three courses, 600-level or higher, from the INFA, INFS and the CSC prefixes. All specialization courses are 3 credits.

Curriculum Management

- In the last curriculum change, we changed the courses and their structure in the curriculum such that the course work emphasized applied learning and the specializations were also updated. We removed the knowledge pre-reqs and modified the core courses so the material covered in the old knowledge requirements is now included within the core, specifically INFA 734 and INFA 736.

We had two specializations, Banking and Financial Security and Cyber Security. The majority of our students enrolled in the Cyber Security specialization, but we changed the specialization to a create-your-own specialization, or General Specialization. Students are able to design their own specialization by taking three 600+ level graduate courses.

Accreditation Standards

- For more than seven years, we have been continuously recognized by the National Security Agency (NSA) as one of the Centers of Excellence in Information Assurance Education.

- Our curriculum confirms to the CNSS (Committee on National Security Systems) standards which is a requirement to obtain the NSA CAE accreditation, and certification.

Arrangements with Businesses and Industry

- We are proud to have a Cyber Security Industry Advisory Board (CSIAB) that meets twice a year to advise us on industry trends within the area of security. The board members are comprised of industry leaders representing critical areas of operations from public and private organizations including healthcare, banking, the state of South Dakota, the National Guard, information consulting firms, and multinational corporations, among others.

- The CSIAB started a new Cyber Security Lunch and Learn Career Series which aims to introduce our students to local careers in cyber security. We held two well attended sessions in the fall of 2013, and have three more planned for spring 2014.

Use of Distance Technology

We use the following technologies for on-line delivery:

- Recorded videos for every class.

- Elluminate software for live video streaming for student presentations, discussions and conversations.

- A dedicated Information Assurance laboratory to conduct experiments and labs via distance over the Internet. A special feature of this lab is that it is not connected to any of the networks in DSU, but is available as a localized, dedicated and isolated laboratory that students can connect securely through the Internet.

Instructional Methodologies

Lectures (videos uploaded for on-line students), Desire2Learn content management system for managing all the courses, Power point presentations, lecture notes using Smart Notebook software.

Network and Security Administration

Mission Statement

The Bachelor of Science in Network and Security Administration, or NetSec, will provide graduates a strong background in computer networking theory, security, Microsoft Windows-based networks, computer forensics, UNIX/Linux network operating systems, and mission-critical applications. Graduates will have the skills necessary to manage the information technology infrastructure required to operate a modern business, with job titles that include as system administrator, network system engineer, systems analyst, network analyst, incident responder, network application developer and technical consultants. Graduates will have a solid business management background, which enables them to effectively communicate with and support the various operational units within a business organization.

Academic Degrees

Bachelor of Science degree in Network and Security Administration.

Curricular Options

- Associate of Science in Network and System Administration.

- Select students (dependent on qualifications) are allowed to apply to the 4+1 Masters of Science in Information Assurance (MSIA) and Masters of Science in Information Systems (MSIS) programs.

Differences among the Programs Being Reviewed

NetSec is one major, comprised of core courses and related support courses. The focus of the major is on the development of technical managerial skills that include computer networking, system administration, information security, and application support. Support courses provide foundations in business, mathematics, and technical writing.

Comparison of the Program with Other Regional Programs

There are few programs that are similar. One such program is the Bachelor of Science in Information Technology with Network Management specialization offered by Colorado Technical University. This program offers a similar track of study including a heavy focus on network and system administration. DSU's program provides a broader exposure to business practices and management skills.

Special Strengths and Unique Features

- The program is focused on providing students with practical skill in the administration of modern computer networks, which may only be achieved through extensive hands-on learning relying heavily upon specialized lab facilities.

- The NetSec and Cyber Operations degree programs are unique but closely related. Students may easily double-major and have the ability to move seamlessly from one program to another, which is advantageous for current students and increases program appeal for prospective students.

Student Progression

Majors are encouraged to complete their general education requirements during their first two years. The foundational CIS 383 Networking I and CIS 385 Networking II courses are slated for completion during their sophomore year. The following core classes are targeted for completion in their junior year: CIS 387 Routing and Switching, CIS 388 Computer Forensics, CIS 460 Windows Administration, CIS 462 UNIX/Linux Administration, CSC 434 Web Software Security, CSC 436 Offensive Network Security, and CSC 438 Defensive Network Security. Students complete either an internship or senior project during their junior or senior year in addition to CIS 466 Survey of Network Administration, and CIS 468 Programming for Network Administration.

Curriculum Management

- All courses in the core are offered on a yearly basis. Insofar as is practical, multiple sections of courses are offered.

- The program was designed so that students could complete their degree in four years, five if the student double-majors in Cyber Operations or enrolls in the 4+1 MSIA degree.

Accreditation Standards

N/A

Arrangements with Businesses and Industry

We actively pursue relationships with employers such as Daktronics, Fishback Financial Corporation, SDN Communications, Wells Fargo, and Citibank, and many others in regards to internship and fulltime employment opportunities. Our Cyber Security Industry Advisory Board also offers guidance from an industry perspective with the NetSec program.

Use of Distance Technology

- Distance education plays a large role in the NSA degree and will continue to grow going forward. The entire NSA degree is currently available online.

- The NETSEC and MSIA degrees are unique in that they offer an entirely identical experience for both online and on-campus students. Distance students and on campus students are expected to complete the exact same assignments using the exact same facilities with the exact same instructions and lectures as the on campus students.

Instructional Methodologies

- On Campus sections utilize a traditional lecture / lab format.

- For the online sections of the Network System Administration degree, classroom lectures are recorded. Labs, and the use of "on campus" resources are meant to be an equal experience to the on campus students. All distance students are expected to complete the same in-class and homework assignments as on campus students.

Part 4: Program Enrollment and Student Placement

Admission Standards

- Masters of Science in Information Assurance & Computer Security: Admissions to this program follow the prescribed standards of all DSU graduate programs.

  o Baccalaureate degree from an institution of higher education with full regional accreditation for that degree.

  o Satisfactory scores on the GRE/GMAT. See program requirements for which test is required for specific programs. The test must have been taken within the last five years. The test can be waived if one of the following conditions is met:

    o A cumulative grade point average of 3.25 or higher on a 4.0 scale for a baccalaureate degree from a regionally accredited college or university in the U.S.

    o Official admission into and demonstrated success in a regionally accredited graduate program in the U.S. Demonstrated success is defined as grades of A or B in at least 9 hours of graduate work.

    o OR Graduation from a regionally accredited college/university in the U.S. at least 15 years ago or more.

  o Other factors (such as student maturity, references, or special expertise) also may be used to determine admission to the program. Also see program specific admission requirements for additional requirements.

- Network and Security Administration: There is no formal admission process for the Computer Network Security program aside from the admission into the university.

Current Enrollments

Total Enrollment

Program enrollment is based on the number of students enrolled in at least one DSU class with an active program of: Network & Security Administration (BS), Network & System Administration (BS), Network & System Administration (AS), Computer & Network Security (BS), Cyber Operations (BS) and Information Assurance & Computer Security (MS) as of fall census. If a student is dually enrolled in a program, they will be counted in both programs.

College enrollment is based on the number of students enrolled in at least one DSU class with an active program in the College of Business and Information Systems as of fall census. If a student is dually enrolled in a college, they will be counted in both colleges (CSC – BIS & Math – AS). However, if a student has multiple active programs in the same college, they will only be counted once at the college level. University enrollment is based on the number of students enrolled in at least one DSU class as of fall census. If a student is enrolled in multiple programs, they are only counted once at the university level.

Table 1: Program, College and University Enrollment

	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
Network & System Administration (AS)	n/a	n/a	2	10	9	13	16
Network & System Administration (BS)	n/a	n/a	5	40	36	41	42
Network & Security Administration (BS)	n/a	n/a	n/a	n/a	n/a	n/a	37
Information Assurance & Computer Security (MS)	19	35	43	42	39	43	36
College of Business & Information Systems	792	850	948	1027	1077	1101	1186
University Enrollment	2570	2780	2861	3101	3102	3110	3129

Note: Network & System Administration (BS & AS) were new programs in fall 2009. Network & Security Administration was a new program in fall 2013.

Table 3: Number of Degrees Awarded by Academic Year

	SU08, FA08 & SP09	SU09, FA09 & SP10	SU10, FA10 & SP11	SU11, FA11 & SP12	SU12, FA12 & SP13	Total Degrees Awarded
Network & System Administration (AS)	n/a	1	3	2	6	12

Network & System Administration (BS)	n/a	0	1	2	12	15
Network & Security Administration (BS)	n/a	n/a	n/a	n/a	n/a	n/a
Information Assurance & Computer Security (MS)	5	11	12	16	20	81

Note: An academic year is defined as summer, fall, and spring for the purpose of this report.

Persistence

Persistence is defined as: The proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent spring semester. The student must be enrolled in at least one DSU class to be considered persisted. For persistence purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A student may be counted more than once. If the student is a double major they will be counted in each major.

Table 4: Persistence Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen (Fall 2009 to Fall 2012 Cohorts)

	Fall 2009 Cohort		Fall 2010 Cohort		Fall 2011 Cohort		Fall 2012 Cohort	
	N	% Ret. 2nd semester (SP10)	N	% Ret. 2nd semester (SP11)	N	% Ret. 2nd semester (SP12)	N	% Ret. 2nd semester (SP13)
Network & System Administration (BS)	n/a	n/a	5	100.0%	3	100.0%	5	100.0%
Network & Security Administration (BS)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

N=total number of students
% Ret 2nd semester = the percentage of students from the cohort who registered for at least on DSU class in the subsequent spring.
Network & System Administration (BS & AS) were new programs in fall 2009. There were no students that met the criteria of full-time, first-time, new freshmen for fall 2009. Network & Security Administration was a new program in fall 2013.

Retention

Retention is defined as: The proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent fall semester. The student must be enrolled in at least one DSU class to be considered retained. For retention purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A student may be counted more than once. If the student is a double major they will be counted in each major.

Table 5: Retention Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen (Fall 2009 to Fall 2012 Cohorts)

	Fall 2009 Cohort		Fall 2010 Cohort		Fall 2011 Cohort		Fall 2012 Cohort	
	N	% Ret. 2nd year (FA10)	N	% Ret. 2nd year (FA11)	N	% Ret. 2nd year (FA12)	N	% Ret. 2nd year (FA13)
Network & System Administration (BS)	n/a	n/a	5	80.0%	3	100.0%	5	100.0%
Network & Security Administration (BS)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

N=total number of students
% Ret 2nd year = the percentage of students from the cohort who registered for at least one DSU class in the subsequent fall.
Network & System Administration (BS & AS) were new programs in fall 2009. Network & Security Administration was a new program in fall 2013.

Placement

Placement information for each program can be found at: http://www.dsu.edu/career/destination-data.aspx.

Program Capacity

Our laboratories and classrooms for both degrees (MSIA and NetSec) are heavily used and highly sophisticated. We have spent the past several years building a lab environment that allows the on campus and distance students to complete the same applied lab activities. The university has invested significant resources in hardware, software, bandwidth, and support for the lab. We continue to be innovative and conscientious in our planning, so that we can accommodate our students. We are a growing program, hoping to continue to grow, and we have not yet met our capacity.

Employment Potential and Placement

Dakota State University MSIA and NetSec students continue to be in demand by regional and national level employers including, CitiBank, Wells Fargo, Secure Banking Solutions, Eide Bailly, Dacotah Bank, National Security Agency, Navy SPWAR, Johns Hopkins University's Applied Physics Laboratory, South

Dakota Bureau of Information and Telecommunications (SD BIT), and others. Typical job titles include the following list:

- Penetration Tester
- Information Security Officer
- Network Administrator
- IT Manager
- Systems Auditor
- Exploitation Engineer
- Security Analyst
- Security & Network Engineer

Part 5: Faculty Credentials

Faculty Listing

A list of the faculty who teach in the undergraduate and graduate Network Security and Information Assurance fields at DSU and their academic credentials are listed in the table below.

Faculty Member	Rank	Academic Credentials	Level of Teaching (UG, GR, or Both)	Faculty Homepages
Kyle Cronin	Instructor	MS	Both	
Pat Engebretson	Assistant Professor	D.Sc.	Both	http://www.homepages.dsu.edu/pengebretson/
William Figg	Professor	Ph.D.	Both	http://www.homepages.dsu.edu/figgw/
Rob Honomichl	Instructor	MS Ed.	Undergraduate	
Josh Pauli	Associate Professor	Ph.D.	Both	http://www.homepages.dsu.edu/paulij/
Ashley Podhradsky	Assistant Professor	D.Sc.	Both	
Kevin Streff	Associate Professor	Ph.D.	Both	http://www.homepages.dsu.edu/streffk/
Brent Tulloss	Instructor	MS	Undergraduate	http://www.homepages.dsu.edu/tullossb/
Josh Stroschein	Instructor	MS	Undergraduate	
Mike Ham	Instructor	MS	Undergraduate	
Yong Wang	Assistant Professor	Ph.D.	Graduate	

Faculty & Student Research Projects & Publications

- Custom fuzzing, reversing, and exploitation framework

- Reverse engineering w/ IDAPro

- Research to prepare for certifications (Security+, Linux+)

- Digital Forensics of non-traditional devices such as gaming consoles

- Digital Forensics of mobile devices

- Pod slurping (malicious iPod/iPhone configurations)

- In-line intrusion detection

- Custom web scanner for functional and security testing

- .NET reverse engineering and exploitation

- Auto-immune disorders in wireless security

- Malware creation and analysis

- Metasploit best practices

- Mastering the BackTrack exploitdb

- Engebretson, Podhradsky, Casey (2013). "An analysis of security vulnerabilities of the Xbox 360 and Xbox Live mobile network" *International Journal of Mobile Network Design and Innovation (IJMNDI)*. In Press.

- Engebretson, Podhradsky (2013). "Security Analysis of Xbox 360 Vulnerabilities" 17th World Multiconference on Systemics, Cybernetics and Informatics (WMSCI 2013), Orlando, USA.

- Cronin, K., Pauli, W., Ham, M. (2012). "Using the Cloud: Keeping Enterprise Data Private" Journal of Information Systems Applied Research 5(3): 24-31.

- Podhradsky, D'Ovidio, Engebretson, Casey (2013). "Xbox 360 Hoaxes, Social Engineering, and Gamertag Exploits." *Hawaii International Conference on System Science*. Maui, HI.

- Podhradsky, D'Ovidio, Engebretson, Casey (2013). "Xbox 360: Mapping Investigative Data." *International Conference on Digital Forensics and Cyber Crime*. Indiana.

- Podhradsky, Casey, Ceretti (2012). "The Bluetooth Honeypot Project: Measuring and Managing Bluetooth Risks in the Workplace." *The International Journal of Mobile Network Design and Innovation.*

- Podhradsky, D'Ovidio, Casey (2012). "The Xbox 360 and Steganography: How Criminals and Terrorists could be "Going Dark." *The Conference on Digital Forensics, Security and Law. May 2012. Richmond, VA.*

- Podhradsky, Kelley (2012). "Analyzing the Impact that Idle Garbage Collection has on Solid State Drives in Windows and UNIX Platforms." *The Security Conference*. May 2012, Las Vegas, NV.

- Podhradsky, Casey, Ceretti (2012). "Managing Bluetooth Risks in the Workplace." *Wireless Telecommunications Symposium (WTS)*. April, 2012. London, UK. In Press. IEEET.

- Perez and J. Pauli: "Municipal E-Government Security: Insights from Municipalities in Orange County, California". Proc. of the The 2012 International Conference on e-Learning, e-Business, Enterprise Information Systems, and e-Government (EEE'12). July 2012, Las Vegas, NV, USA.

- R. Woeffel and J. Pauli. "Towards Tool-Driven Penetration Testing for Form-Based Authentication". *Proc. of the 8th International Conference on Information Technology: New Generations (ITNG 2012).* April 2012, Las Vegas, NV, USA.

- Klindworth and J. Pauli. "An Introductory Look at Vulnerability Hunting". *Proc. of the 8th International Conference on Information Technology: New Generations (ITNG 2012).* April 2012, Las Vegas, NV, USA.

- D. Greene and P. Engebretson. "An Integrated Approach to Network Vulnerability Scanning for Security Engineers". *Proc. of the 8th International Conference on Information Technology: New Generations (ITNG 2012).* April 2012, Las Vegas, NV, USA.

- H. Kam and J. Pauli. "Web Penetration Testing: Effectiveness of Student Learning in Web Application Security". *Proc. of 2011 IEEE Frontiers in Education (FIE).* October 2011. Rapid City, SD, USA.

- J. Pauli, M. Ham, M. Zautke, and P. Engebretson. "CookieMonster: Automated Session Hijacking Archival and Analysis". *Proc. of the 7th International Conference on Information Technology: New Generations (ITNG 2011).* April 2011, Las Vegas, NV, USA.

- P. Engebretson, J. Burroughs, and J. Pauli. "Attack Traffic Libraries for Testing and Teaching Intrusion Detection Systems". *Proc. of Information Systems Analysis and Synthesis: (ISAS 2011).* March 2011. Orlando, FL, USA.

- J. Windsor and J. Pauli. "Smashing Web Goat for Fun and Research: Static Code Scanner Evaluation", *Proc of the 2010 OWASP AppSec DC Conference*. November 2010, Washington, DC, USA.

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- P. Engebretson, J. Pauli, and J. Bosma. "Lessons Learned From an Evolving Information Assurance Lab". *Proc. of the 2010 International Conference on Security and Management (SAM'10)*. July 2010, Las Vegas, NV, USA.

Faculty & Student Research Outreach Projects

- DSU team placing 2nd in the 2012 National Collegiate Cyber Defense (CCDC)
- DSU team placing 1st in the 2013 National Cyber League
- DSU team in the iCTF
- DSU team in Cyberlympics at Hacker Halted
- DSU team in OWASP's University Challenge
- DSU team at ACM programming contests
- Creation and execution of the North Central CCDC region hosted at DSU
- Assisted area high school teams prepare for the Cyber Patriot competition
- Assisted with 2-day Summer Security Boot Camp for high school students
- Assisted with DakotaCon; an annual security conference on DSU's campus
- Assisted with college visitation days at DSU for prospective students

Part 6: Academic and Financial Support

Undergraduate Programs Support Services

The College of Business and Information Systems office is the central point of support for undergraduate students with majors within this college. The central office is located in the Dean's office, which is located in the college building. The office is also provided with several work-study positions that are tasked with helping faculty whenever help is requested.

The College of Business and Information Systems office staff

Name	Title
Tom Halverson	Dean, College of Business and Information Systems
Wayne Pauli	Associate Dean, College of Business and Information Systems
Kathy Engbrecht	Retention Specialist
Kati Larsen	Senior Secretary
Aeriell Jastorff	Senior Secretary

Graduate Programs Office

The Office of Graduate Studies and Research was established to promote and support graduate education at DSU. The Dean of Graduate Studies and Research collaborates with and supports the functions and responsibilities of the Graduate Council and the graduate program committees within each college and serves as the advocate for graduate education and graduate student support at DSU. The Office of Graduate Studies and Research staff is included in the table below.

The day-to-day operations and services provided by the Office of Graduate Studies and Research are client-centered. The office offers guidance and help to students from the first inquiry to graduation. This includes providing accurate and timely program information and maintaining the graduate programs website with current information for degree-seeking students (URL: http://www.dsu.edu/gradoffice/index.aspx). The office also facilitates the recruitment of prospective students, the application process, assisting in setting up interactive audio-video for remote sites in South Dakota and online for distance students. Other services provided by the Office of Graduate Studies and Research include assisting with course scheduling and course rotations; making students aware of changes in schedules, rotations, and graduate policies; assisting with registration; supporting the assistantship committees; monitoring student progress toward graduation; and serving as a liaison among other support staff, faculty, and administrators.

Office of Graduate Studies and Research Staff

Name	Title
Omar El-Gayar	Dean, Office of Graduate Studies & Research
Jennifer Mees	Program Assistant II
Erin Blankespoor	Senior Secretary

Library Resources and Services

The mission of the Karl E. Mundt Library and Learning Commons is to supply the library and information needs of the students, staff, and faculty of Dakota State University and to support the University's stated mission and goals.

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In an information society, information literacy is critical. DSU students should be able to find, evaluate and use information for problem solving and decision making in all aspects of their lives -- at home, in the workplace, and as informed citizens in a democratic society. The goal of the library is to provide the instruction and tools students need to be effective information users.

A Learning Commons is defined as a student-centered collaborative learning place. Increasing use of technology as a means of accessing information and the recent shift towards cooperative learning and group study have brought changes in the way students use academic libraries and library resources. In the Mundt Library and Learning Commons they are experimenting with new ways to combine information resources, services, technology, and research assistance. They partner with the DSU Retention Specialist to provide space for tutoring, and provide art gallery space managed by the College of Arts and Sciences.

The Library provides access to an extensive collection of materials through its online library catalog which includes the over 4.5 million holdings of more than 70 member libraries of the South Dakota Library Network (SDLN). In addition to its print holdings, the Library subscribes to numerous electronic indexes and full text research databases, most notably, EBSCO's Academic Search Premier, IEEE CS Digital Library, ProQuest Research Library, ABI-Inform, MLA Bibliography, Lexis-Nexis and many, many more. These databases are authoritative scholarly research tools needed to support DSU's academic programs. The Library's website provides the on- and off-campus community with direct access to the information resources critical to the various disciplines. Materials held by other libraries are also readily available through the interlibrary loan system so rarely is the Library unable to quickly meet an individual's information needs. The Library also provides online access to tutorials and other research aids for the independent scholar.

The most important and best resources available are the library staff. These trained professionals are here to help you find and use the resources you need – in person or online by using the "Ask a Librarian" link on the Library's website. In addition to the collections, systems and services offered, library staff provides assistance and instruction to faculty and students through workshops, classroom and one-to-one instruction.

The Library has a wide array of digital equipment like video cameras and digital audio recorders for use by students as well as standard AV equipment like video players and format converters. Meeting rooms, collaboration spaces, study rooms and viewing rooms equipped with TV/DVD/VCR or video projectors connected to various types of players are also available. Many computer peripheral devices like cameras and recording devices are available for check out. Networked computers and scanners are located on the main floor as are many tables equipped with power sources for quick and easy Tablet PC battery recharging between classes.

Peer tutoring services are available in the Tutor Center located on the main floor of the Library. Additional tutorial support is provided online in Lynda.com, and Learning Express Library; link to them in the Database Quicklinks drop down box on the Library's main page.

In addition to the collections, systems and services offered, library staff also provide assistance and instruction to faculty and students through workshops, classroom instruction, and one-to-one. Library faculty collaborates with course faculty to ensure students have the research background necessary to complete course assignments. Library faculty develops tutorials, subject guides, and other instructional materials to support classroom learning on campus and at a distance.

It is also the Library's goal to graduate students who are able to find, evaluate, and use information to solve problems and to make decisions effectively. Graduates should have the knowledge and skills to function successfully as continuous learners in a continuously changing information world. To successfully

meet its goals, the library provides excellent collections, information systems, services, instruction, and staff. The professional library staff is included in the below.

Professional Library Staff

Name	Title
Ethelle Bean	Assoc. VP/ Professor / Library Director
Mary Francis	Assistant Professor / Instruction / Reference Librarian
Risë Smith	Professor / Digital Access & Design Librarian

Technology infrastructure

DSU has an excellent technology infrastructure supporting wired and wireless access to computing resources. Computing Services staff provides technology support to faculty, staff, and students.

Lead Computing Services Support Staff

Name	Title
Stephanie Baatz	Help Desk Manager
Josh Boldt	Computer Support Analyst
Craig Miller	Senior Systems Programmer
David Overby	Chief Information Officer & Head of Computing Services
David Vickmark	Technology Integration Specialist
Brent Van Aartsen	Communication Network Specialist E-Education Services
Haomin Wang	Manager of Instructional Technology, Computing Services

E-education services

Extended Programs is responsible for program planning, marketing, program implementation and overall management of courses and programs offered by alternative delivery (i.e., Internet, DDN) or at off-campus locations by Dakota State University. Working in partnership with the colleges and the institution's academic support areas. Extended Programs works to design and develop active and collaborative degree programs at a distance or at off-campus sites such as the University Center in Sioux Falls.

The Extended Programs staff is located in the Tunheim Classroom Building. The staff serves the needs of students who are enrolled in the online and videoconferencing courses at DSU and in courses at off-campus locations. The office is the mainstay of distance services to students, working with the administrative offices of DSU to provide these services. The office staff assists faculty in the design and implementation of courses delivered by various forms of technology. Proctoring services for online courses are provided by the Extended Programs office at DSU.

The video conferencing classrooms on campus are located in the Tunheim Classroom Building (TCB). The Dakota Digital Network (DDN) room is located in TCB 103. The Governor's Electronic Classroom (GEC) is located in TCB 111 and the third room is located in TCB 109.

E-Education Services is staffed with the Director of Extended Programs, the Manager of Instructional Technology, an Instructional Technology Specialist, a Communications Network Specialist, the Distance Education Specialist, and a Senior Secretary. This team serves the needs of students who are enrolled in the online and videoconferencing courses at DSU. The office is the mainstay of distance services to students, working with the administrative offices of DSU to provide these services. The staff also serves the Web needs of faculty, staff and students at DSU and the needs related to educational technology. The

office staff assists faculty in the design and implementation of courses delivered by various forms of technology.

Extended Support Staff

Name	Title
Brent Van Aartsen	Communications Network Specialist, Computing Services
Susan Eykamp	Distance Education Specialist, Extended Programs
Peg O'Brien	Director, Extended Programs
MingMing Shao	Instructional Technology Specialist, Extended Programs
Annette Miller	Senior Secretary, Extended Programs Web Support Technologist, E-Education Services

Administrative Support Staff

Current administrative staff that provide the academic support services to deliver undergraduate and graduate programs at DSU. The administrative support personnel who are particularly critical to the delivery of these programs are listed below.

Administrative Support Staff

Name	Title
Carrie Ahern	Director of Institutional Effectiveness and Assessment
Sandy Anderson	Registrar, Enrollment Services
Steve Bartel	Director of Student Union/Residence Life
Keith Bundy	Director of Student Development / Asst. Dean for Student Development
Amy Crissinger	Associate VP for Enrollment Management/Marketing
Ben Jastorff	Director of Bookstore
Jeff Dittman	Director of Athletics
Amy Dockendorf	Controller
Dan Friedrich	Director of the Center for the Advancement of Health Information Technology
Denise Grayson	Director of Financial Aid
Maria Harder	Director of Human Resources
Sara Hare	Director of Budget & Grants Administration
Claire Larson	Director of Food Service
Pat Keating	Director of Physical Plant
Mickie Kreidler	Director of Sponsored Programs
Marie Lohsandt	Director of Career Services / Asst. Vice President for Student Affairs
Craig Miller	Senior Systems Programmer
Mandy Parpart	Director of Student Activities
Jona Schmidt	Director of Alumni

Academic Advising

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Undergraduate students are assigned advisors in the College of BIS and all BIS faculty are expected to contribute to academic advising. Advisees are assigned based on majors and students can request a change in advisor at any time. Some faculty elect to participate in the Freshman Seminar activities while others focus more on graduate and upper level advising duties. The retention efforts on campus have led to increased analysis of the advising process.

Students in the MSIA program will be required to work with their advisor to complete a Plan of Study within their first semester in the program. Information regarding advising, program rules and requirements, rotations, knowledge courses, and expected milestones will be provided through the online materials posted on the Graduate Offices website and in the Graduate Catalog.

Computer Infrastructure

Information Technology Services (ITS) advances the mission of DSU by ensuring reliable core systems and network infrastructure, excellent technology support, and assisting technology integration into the curriculum and business processes. Information Technology Services is responsible for the planning, management, and direction of technology initiatives in support of both academic and administrative operations at DSU. ITS staff provides the campus community with a diverse set of technology services including:

- Development, monitoring, and maintenance of the campus data network;

- Help desk and tablet repair services;

- Computer lab and server management;

- Administrative application development;

- Website and web application development services;

- Academic technology training and assistance;

- Multimedia services.

Working in partnership with the colleges and the institution's academic support areas, Information Technology Services develops the image of applications installed on student tablets. ITS staff operates a help desk and repair center, staffed primarily by students, to quickly respond to any computing or network access problems in campus offices or computing laboratories or with students tablet pc's.

Financial Support

There are three sources of funds that support these programs.

- CIS/CSC program fees - $21.20 per credit

- CIS/CSC/INFA/INFS lab fees - $54.80 per class

- WMCI fee - $369.00 per semester

These lab fees are placed in a local account and support courses in MSIA, NETSEC, and NSA. Funds that remain in the lab fees account at the end of the fiscal year are placed in a reserve account.

Additional support for professional development and training is provided from funds allocated through the Vice-President of Academic Affairs (VPAA) office. Faculty members apply for support up to $1,000 per year, which is available for each faculty member. In addition to these traditional funds, there is also available funding from the VPAA's Office for additional faculty development funding that has historically been used to attend Black Hat (and similar) training sessions.

Part 7: Facilities and Equipment

Both of the programs make heavy use of DSU's Information Assurance (IA) lab. Essentially all courses in the programs leverage the resources available in the IA lab. The lab is built upon industry standard hardware and software. In order to provide dynamic use of the hardware resources, a platform of virtualization has been developed in order to allow all students to complete hands on labs in an independent fashion without interference. Students using the lab will not only become more familiar with the topics being taught, but will also become familiar with the use of enterprise level virtualization hardware and software in an environment similar to a realistic business.

The hardware in use includes the latest available models of HP DL380 servers, HP StorageWorks storage arrays, and Cisco switches. Software in use includes VMware vSphere 4.1, VMware View 4.6, and VMware LabManager. The lab's capacity is limited, and with ever growing use the lab's load is larger and larger every year. Storage space is becoming ever limited with extended enrollments and loads placed upon the lab's hardware.

Classroom space is adequate given the reliance on the IA lab and future plans include moving into the renovated Madison Community Hospital building in fall 2016.

Part 8: Assessment and Strategic Plans

The MSIA and NetSEc programs at DSU will continue to specialize in the hands-on aspects of technical security and technology administration areas. Our recent National Science Foundation Scholarship for Service (NSF-SFS) award and National Security Agency Cyber Operations designation are testaments that government agencies are strongly interested in DSU's security students because of the technical skills they learn at DSU.

Student enrollments are expected to stay in the 30 new freshmen/transfers per year in NetSec with an emphasis on recruiting and retaining high achieving students that can excel in a highly technical program. New students to the MSIA are expected to be 15-20 per year given DSU's recent addition of a MS in Applied Computer Science with an emphasis in Cyber Operations.

Research and outreach activities will be aligned with the technical strong points of the programs, specifically ethical networking hacking, web application assessments, reverse engineering, intrusion detection, and malware analysis. There is currently no standardized accreditation mechanism for security programs; however, DSU's programs will continue to leverage relationships in the Federal Government, financial services, and health care to ensure the degrees are commensurate with what these entities need in tomorrow's security and technology professionals. There are three areas of needed support to ensure DSU is recognized as a national leader in information assurance and technology:

- Additional faculty members are needed to continue to grow and support the program.

- It is critical to continue our investment in our IA laboratory facilities to ensure we are a national leader in providing hands-on learning experiences for our students.

- Current and future faculty members must continue to integrate the ever-changing topics of security into the programs by attending training sessions and bringing that knowledge back to the students.

The security programs at DSU are our flagship programs and needs to be supported as such. Given DSU's technology mission and the recent growth and success of these programs, this is one program that deserves substantial support from all levels of the public education system.

MSIA Assessment

The MSIA program includes two objectives to drive assessment of the program:

1. Implement managerial strategies to measure and improve information assurance efficiency and effectiveness.

2. Provide leadership in the organizational efforts to adopt new technologies and security approaches.

The most recent assessment plan, data, and summary reports for the MSIA program can be downloaded from: http://www.dsu.edu/academics/assessment/academic-assessment/major-field-grad-table.aspx.

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Network and Security Administration Assessment

The NSA program includes five objectives to drive assessment of the program:

1. Students will develop advanced knowledge in networking technologies for a career in networking and system administration.

2. Students will develop advanced knowledge in system administration technologies for a career in networking and system administration.

3. Students will develop an understanding of programming concepts with an advanced knowledge in scripting for a career in networking and system administration.

4. Students will develop an understanding of security concepts with an advanced knowledge in security for a career in networking and system administration.

5. Students will develop the interpersonal skills that foster professional responsibility, leadership, and team work.

The most recent assessment plan, data and summary reports for the NetSec program can be downloaded from: http://www.dsu.edu/academics/assessment/academic-assessment/major-field-undergrad-table.aspx.