



# Northern Illinois University

**2018 Program Review Report**

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September 2018

**Reporting Institution:** Northern Illinois University  
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**Program:** B.S. in Athletic Training (51.0913)

Major Findings and Recommendations:

- **Major changes in the program:** The Bachelor of Science (B.S.) in Athletic Training program prepares students for careers as athletic trainers in a variety of settings (e.g., secondary schools, colleges/universities, and sport medicine clinics/hospitals). The program infuses evidence-based practice throughout the curriculum and strives to integrate research into the classroom, laboratory, and clinical learning experiences. Career prospects for athletic trainers are strong. According to the U.S. Bureau of Labor Statistics, the outlook for employment of athletic trainers is projected to grow 19 percent between 2012 and 2022. The outlook for Illinois is particularly strong with the greater Chicagoland area ranked first in the nation for the number of athletic trainers employed. The program is accredited by the Commission on Accreditation of Athletic Training (CAATE). In May, 2015, the athletic training profession, via the Strategic Alliance (including representation from CAATE) made the decision to change the professional degree in athletic training from the bachelor's level to the master's level. The program faculty has, therefore, been working to substantively change the current B.S. in Athletic Training program profile to shift to offering the athletic training professional degree at the master's level. The M.S. in Athletic Training program was approved by the Illinois Board of Higher Education in March, 2017. The department is preparing to accept students into the new program in Fall 2019.
- **Major findings and recommendations:** Enrollments in the B.S. in Athletic Training program have remained relatively constant (from 61-69 FTEs) over the period from 2013-2017. In comparison to peer institutions, the program faculty were on par or above their peer group in scholarly productivity (per Academic Analytics data). Costs per credit hour were below peers (per Delaware Cost study data). The program faculty have provided some outstanding external service, including serving as Editor-in-Chief of the *Athletic Training Education Journal* and President of Great Lakes Athletic Trainers Association. Alumni survey responses were positive across the review period with students expressing satisfaction with their degree (from 90 percent to 95 percent) and their time to degree completion (from 87 percent to 93 percent). The program participates in numerous partnerships with secondary schools, universities, community colleges and rehabilitation clinics. The program has faced challenges related to faculty shortages and aging facilities.
- **Actions taken since the last review:** Athletic training at NIU has been in the process of transitioning to a master's degree program as described above. The program faculty have also taken direct action to address negative accreditation findings over the review period. The program was placed on probation with CAATE in early 2017 because the annual first-time-

takers' pass rate for the Board of Certification (BOC) exam was 69 percent, just below the 70 percent requirement. The BOC first-time pass rate has fallen below 70 percent just once since 2012–2013. Program representatives believe the cohort with the low pass rate may have been more challenged than most, and was suffering the effects of the faculty staffing shortage. In May, 2017, the program submitted a detailed action plan to CAATE to address this concern which includes introducing additional programmatic assessments, a scaffolding approach to examinations, and mapping questions to learning objectives.

- Actions taken as a result of this review: The department aspires to return to three full-time faculty members in the program. A faculty search is currently underway.

## Outcome

- Decision:

\_\_\_x\_\_\_ Program remains in good standing but is being phased out (assessment of student learning outcomes will continue as students are taught out of the program).

Explanation: The Bachelor of Science in Athletic Training is no longer accepting students and will be phased out and replaced by the Master of Science in Athletic Training which is tentatively scheduled for program review in 2022-2023.

**Program:** B.S. in Electrical Engineering (14.1001)

## Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Electrical Engineering program educates students on how to design, develop, and operate technology that generates and uses electricity. In addition to the core requirements, students in the program choose from electives in microelectronics, power and controls, signal processing and communications, electromagnetics, and computer engineering. Electrical engineers work in industries including research and development, engineering services, manufacturing, and telecommunications, and within the federal government. The U.S. Bureau of Labor Statistics predicts that careers in electrical engineering will grow 7 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: Enrollments in the B.S. in Electrical Engineering program have increased over the review period both in terms of FTE students and credit hour generation. In Fall 2013, 354 FTE students were enrolled in the program and 4,762 credit hours were generated in FY2013. In Fall 2016, 402 FTE students, were enrolled in the program and 6,052 credit hours were generated in FY2016. Though not dissimilar from other electrical engineering programs across the country, the student body has limited female and underrepresented students, 12 percent and less than 20 percent respectively. Scholarly productivity, as reported in Academic Analytic data, is low relative to IPEDS peers, at the 6<sup>th</sup> percentile for both articles per faculty member and grant dollars per faculty member. Program faculty use assessment of student learning outcomes for continuous program

improvements, including adding online courses for student convenience. The program is recommended to continue to develop online courses to provide additional opportunities to students, continue to work on increasing diversity in the student body, and work to further differentiate NIU's program from competitors by publicizing what is unique about NIU's program.

- Actions taken since the last review: Several changes in the B.S. in Electrical Engineering program have been implemented since the last review. For example, following a recommendation of the departmental assessment and curriculum committees, the program separated ELE 250 Computer Engineering I with lab into ELE 250 Computer Engineering Lecture and ELE 250U Computer Engineering Laboratory. This was done to simplify the articulation of these courses from community colleges resulting in less difficulty for students transferring in credits. A second change involved adding new elective courses to give students more options in various areas of specialization including in the areas of radio frequency electronics and processor based systems. Another example is the addition of online courses which has provided access to courses for students who might not have been able to attend the face-to-face courses. These courses have been particularly popular in the summer when most students are off campus.
- Actions taken as a result of this review: The Department of Electrical Engineering continues to explore innovative methods of providing quality education to more of its students. In tandem with, and as a result of this review, the program is examining innovative approaches to provide more flexibility to faculty to increase their scholarly productivity including undertaking steps for engaging more students in faculty-led research and scholarly publications. Program faculty are also committed to recruiting and engaging more undergraduate students in research through the Summer Research Opportunities Program. In order to further differentiate and publicize the B.S. in Electrical Engineering program, the department is strengthening its efforts in the following ways: (1) conducting more outreach to high schools and community colleges in the region through the production of video clips and promotional materials of student and faculty-led project demonstrations and (2) gathering information about best practices from other engineering programs to better inform strategies towards outreach and recruitment. The department is hopeful that its outreach activities should further improve its enrollment percentage of women and underrepresented students.

## **Outcome**

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Bachelor of Science in Electrical Engineering program has growing enrollments and engages in continuous improvements efforts grounded in data from student learning outcomes assessment.

**Program:** M.S. in Electrical Engineering (14.1001)

Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Electrical Engineering program expands students' ability to undertake complicated electrical engineering problems, research and develop new systems, and use modern techniques to analyze and design electrical components. Students participate in in-depth study of circuitry, devices, wave engineering, communications systems, and electromagnetics. Students choose from a thesis or non-thesis option. The latter has additional coursework. Students may also specialize in applied radio frequency engineering but this requires the completion of a thesis. Electrical engineers work in industries including research and development, engineering services, manufacturing, telecommunications, and within the federal government. The U.S. Bureau of Labor Statistics predicts that careers in electrical engineering will grow 7 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: Graduate credit hours have increased by 85 percent over the review period from a low of 695 in FY2012 to 1,270 in FY2015. Likewise, enrollments grew from Fall 2012 with 49 FTE students to Fall 2014 with 79 FTE students but dropped substantially in Fall 2016 to 39 FTE students. As noted in the review of the B.S. degree, scholarly productivity, as reported in Academic Analytic data, is low relative to IPEDS peers, at the 6<sup>th</sup> percentile for both articles per faculty member and grant dollars per faculty member. Alumni report satisfaction with the program, consistently at or near 100 percent throughout the reporting period. The program uses assessment of student learning outcomes for continuous program improvement. The program is recommended to conduct a review of other institutions with growing enrollments in their M.S. in Electrical Engineering programs to identify adoptable practices, work on means to grow program enrollments, and develop advising strategies to centralize the process for retention within the program.
- Actions taken since the last review: Since the last review, the M.S. in Electrical Engineering program has engaged in continuous improvement initiatives in a number of areas including curriculum updates and advising procedures. In 2013, the program faculty completed a major revision of the graduation requirements. This revision allows for three different paths toward graduation. Two of these culminate in a thesis and the third is a non-thesis project option. Thesis option 1 is intended to be the most research intensive option. With a high level of research guided by a faculty mentor, the coursework is considerably reduced requiring the students to do more independent learning. Thesis option 2 is a more traditional thesis option. Required coursework provides students with the background knowledge necessary to develop a thesis proposal before moving on with the detailed research. The non-thesis option requires more coursework culminating in a design project. In addition to improvements in the curriculum, several procedural improvements have been made that aid in helping students to proceed through the program more efficiently. These efforts have shown positive results as evidenced by data on reduced time to degree completion since the implementation of these changes.
- Actions taken as a result of this review: As a result of this review, the program has established a new recruitment event to attract more domestic undergraduate students either

through an accelerated B.S. to M.S. program or upon undergraduate graduation. Participating students are provided with information on various specialization options within the program, advantageous career opportunities, and enhanced earning income relative to a B.S. degree holder as well as incentives such as eligibility for receiving tuition waivers and graduate assistantships. As a result of its inaugural event in Spring 2018, the program is seeing some early signs of increased undergraduate student participation in the M.S. program from its current level of less than 20 percent. As an additional recruitment effort, the program, in coordination with the Honors Program, is proposing a guaranteed admission to the M.S. program for Honors students. The department will seek assistance from underrepresented-student organizations, including the Society of Women in Engineering, in order to increase diversity representation in the M.S. program. As a new retention initiative commencing in Fall 2018, all new M.S. students will attend a common class on a weekly basis to learn more about contemporary related research topics from faculty, project planning strategies, degree completion process, and career planning.

## **Outcome**

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Master of Science in Electrical Engineering program engages in continuous improvements efforts grounded in data on student learning outcomes assessment and is actively working to increase enrollments.

**Program:** B.S. in Industrial and Systems Engineering (14.3501)

### Major Findings and Recommendations:

- Major changes in the program: Students earning a Bachelor of Science (B.S.) in Industrial and Systems Engineering (ISYE) develop skills in improving processes and production of goods and services by identifying avenues toward greater efficiency and innovative means to increase productivity within systems. Industrial engineers find ways to eliminate wastefulness in production processes. They devise efficient systems that integrate workers, materials, information, and energy to make a product or provide a service. The B.S. in ISYE program provides three areas for emphasis: Health Systems Engineering, Manufacturing Systems, and Engineering Management. The U.S. Bureau of Labor Statistics predicts the job outlook for industrial engineers will grow at 10 percent (faster than average) during the time period from 2016-2026. The Bureau also reports that the median annual wage for industrial engineers with B.S. degrees was \$85,880 in 2017.
- Major findings and recommendations: Faculty in the B.S. in ISYE program have been honored with several teaching and research awards including one Presidential Teaching Professor, one Most Valuable Professor Award, one Young Faculty Award, and two

Innovation Awards. The B.S. in ISYE program is the third largest program in the state, following programs at Northwestern University and the University of Illinois at Urbana-Champaign. The B.S. program contributes to the General Education program by offering three courses related to the Nature and Technology Knowledge Domain. The B.S. in ISYE program utilizes a mature system of assessment and has been praised by external accreditors. Program alumni surveyed consistently report between 80 to 100 percent employment within six months of graduation. While enrollment in the B.S. program has remained relatively stable over the review period (at approximately 111 FTEs), graduation rates have doubled in the same period, speaking to higher retention levels. Similarly, credit hour production at the undergraduate level has increased from 2,331 credit hours in FY2013 to 3,127 credit hours in FY2017.

- Actions taken since the last review: Since the last review, the B.S. in ISYE program faculty have implemented several curricular changes, based on assessment data, to better serve the needs of their students. Among these are a new Emphasis in Engineering Management, Minor in Sustainable Engineering, Certificate in Lean Six Sigma, and Certificate in Logistics. Every senior design project is now fully funded by companies ensuring that students have the opportunity to practice theory taught in class on real-life projects from the sponsors. Students in the health systems emphasis do their projects at hospitals; manufacturing systems emphasis students work in a manufacturing companies; engineering management students work on projects where they can exhibit both engineering and management skills. Between Spring 2011 and Spring 2017, over 150 students participated in these projects to complete 60 projects that helped the department to generate over \$350K in revenue.
- Actions taken as a result of this review: Several actions will be taken as a result of this review. Among these, more courses will be offered online for greater student access, exit surveys will be added to existing assessment methods currently in place for B.S. students, and more efforts will be made to offer additional 2+2 agreements with community colleges and possibly with international universities moving forward.

## Outcome

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Bachelor of Science in Industrial and Systems Engineering program prepares students to participate in a fast-growing field. Retention and credit hour generation in the program are on the rise. The program has a mature assessment system and uses data from the system for programmatic improvements.

**Program:** M.S. in Industrial and Systems Engineering (14.3501)

Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Industrial and Systems Engineering (ISYE) program prepares students to function at an advanced level in industrial and systems engineering settings including offices, health care settings, and manufacturing companies. The M.S. in ISYE program, with its Specialization in Engineering Management, allows students opportunities to follow one of two tracks, Engineering and Decision Analysis or Global Logistics. Regardless of the track chosen, students in the program gain the knowledge, skills, and tools to become proficient in the application of advanced industrial and systems engineering concepts and techniques to design, analyze and improve manufacturing, as well as service systems and become capable of conducting in-depth, independent research/projects and reporting the results of that research in both written reports and formal presentations. Students in the M.S. program work closely on research with faculty and have the option of completing a thesis or a Master's project or paper to fulfill the M.S. program requirements. The U.S. Bureau of Labor Statistics predicts the job outlook for engineering managers will grow at 6 percent (as fast as average) during the time period from 2016-2026. The Bureau also reports that the median annual wage for engineering managers was \$137,720 in 2017.
- Major findings and recommendations: The M.S. in ISYE program is the largest in the state. The program has seen enrollment growth of FTE students of nearly 200 percent during the review period and an increase in degrees conferred of approximately 150 percent in the same time period. Credit hours generated at the graduate level in ISYE grew from 651 in FY2013 to 2,536 in FY2017. Growth in enrollments over the review period have created a need for expansion in classroom, office, and lab spaces. The program has a mature assessment system in place. Alumni of the program appear satisfied with 70 to 100 percent of alumni responding to surveys over the review period indicating they are satisfied with their M.S. in ISYE degree. Faculty in the program are productive in research, bringing in over \$6.5 million in grants and contracts over the review period.
- Actions taken since the last review: Utilizing assessment data and program review feedback, program faculty in the M.S. in ISYE program have implemented a number of curricular changes since the last program review including a Graduate Certificate in Lean Six Sigma, a Graduate Certificate in Logistics, and several new courses in logistic and data analytics. The program has also developed and offered eight new online programs for greater access for graduate students. The programmatic student learning outcomes have been revised following feedback from the last program review.
- Actions taken as a result of this review: Following this review, several actions are planned. Among these, a new proposal on guaranteed admission to the M.S. in ISYE for NIU Honors students will be executed in the Fall 2018 semester. New Memorandums of Understanding have been drafted to offer dual degree programs, 1+1 programs, and 5+1.5 programs with universities in India and Colombia. More online courses for the technical electives in the Global Logistics Track of the M.S. in ISYE program will be offered. Creating and offering these courses online will attract more practitioners from local industry to the program.



## Outcome

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Master of Science in Industrial and Systems Engineering program prepares students for high-paying careers that are in demand. The program is the largest of its kind in the state and enrollments are growing rapidly. The program has a mature assessment system and uses data from the system for programmatic improvements.

**Program:** B.S. in Mechanical Engineering (14.1901)

### Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Mechanical Engineering program provides students with a strong foundation in both the sciences and engineering. Students explore concepts such as solid mechanics, dynamics and controls, fluid mechanics, thermodynamics, heat and mass transfer, energy conservation and manufacturing. Students can choose an emphasis in one of three areas: advanced computing and simulation, mechatronics and robotics, or sustainable energy. The U.S. Bureau of Labor Statistics predicts that careers in mechanical engineering will grow 9 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: The B.S. in Mechanical Engineering program has grown over the review period both in terms of enrollments and credit hour production. In Fall 2012, the program had 475 FTE students compared to 616 in Fall 2016. Similarly, in FY2013, the program generated 6,454 credit hours compared to 9,769 credit hours in FY2017. Alumni report satisfaction with the program, ranging from 86 percent to 89 percent across the review period. Program faculty have been awarded for outstanding college undergraduate education four times in the last five years. One outstanding faculty member was named the Illinois Educator of the Year in 2015. The program has room for growth in the utilization of assessment of student learning outcomes data for program improvement. For example, the program does not currently track numbers or outcomes of students involved in NIU's Honors Program or Research Rookies. The program is recommended to utilize feedback from Accreditation, Assessment and Evaluation to improve measures of student learning outcomes, track students involved in the Honors Program and Research Rookies, and continue to gain information from alumni.
- Actions taken since the last review: Since the last program review for the B.S. in Mechanical Engineering program, the program faculty revised the Program Educational Objectives through discussions and approval by the faculty members and published these on the departmental website, the College of Engineering and Engineering Technology's Undergraduate Student Handbook online, and in NIU's Undergraduate Catalog. The Programs Educational Objectives were also reviewed on a four-year cycle by the

department's Industrial Advisory Board and students for feedback in Fall 2013 and Fall 2017 to ensure there is alignment with the needs of the program and its constituents. Further, the program implemented an accelerated degree sequence allowing students to earn both the B.S. and M.S. in Mechanical Engineering degrees in a shorter period of time. The sequence is available to all undergraduate mechanical engineering majors who have finished at least 90 semester hours of undergraduate work with a GPA of at least 3.00.

- Actions taken as a result of this review: As a result of this review, the program faculty have plans to address three areas. First, the program will utilize feedback from Accreditation, Assessment and Evaluation (AAE) to improve measures of student learning outcomes. Working closely with AAE, the program has obtained appropriate resources to improve measures of student learning outcomes and has piloted a survey requesting student feedback on their progress toward meeting learning outcomes. The program faculty will review the survey data to inform continuous program improvement efforts. Second, the program will begin more systematic tracking of the students involved in the Honors Program and Research Rookies. Third, the program will continue to gain information from alumni.

## Outcome

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Bachelor of Science in Mechanical Engineering program has award-winning teaching faculty and increasing enrollments and credit hour production. The program is working toward greater linkages between continuous improvements efforts and the assessment of student learning outcomes.

**Program:** M.S. in Mechanical Engineering (14.1901)

## Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Mechanical Engineering program prepares students with skills to engage in advanced research with opportunities in systems development and involvement in components or processes in specialty areas such as applied mechanics or computer-aided manufacturing. The U.S. Bureau of Labor Statistics predicts that careers in mechanical engineering will grow 9 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: Enrollments in the M.S. in Mechanical Engineering program have grown over the review period from 45 FTE students in Fall 2012 to 81 FTE students in Fall 2017. Similarly, degrees conferred have grown from 22 in FY2012 to 36 in FY2016. As noted in the review of the B.S. program, faculty have been awarded for outstanding college undergraduate education four times in the last five years and one outstanding faculty member was named the Illinois Educator of the Year in 2015. Research

productivity is below average when compared to IPEDS peers through Academic Analytics data which show that articles per faculty is at the 9<sup>th</sup> percentile and grants per faculty is at the 18<sup>th</sup> percentile compared to peers. The program has room for growth in the utilization of assessment of student learning outcomes data for program improvement. The program is recommended to utilize feedback from Accreditation, Assessment, and Evaluation to improve measures of student learning outcomes and to further differentiate these from the student learning outcomes of the B.S. in Mechanical Engineering. The program is also recommended to continue to utilize information and resources to improve student success.

- Actions taken since the last review: Since the last review for the M.S. in Mechanical Engineering program, the program has increased opportunities for graduate students to attend conferences and present research, thereby incentivizing faculty to complete more research with graduate students, providing them with greater experiential learning opportunities. The program faculty have engaged in curriculum review and the development of seven new graduate courses offered in a wide range of areas. As noted in the review of the B.S. program, an accelerated degree sequence has been implemented, allowing students to earn both the B.S. and M.S. in Mechanical Engineering degrees in a shorter period of time.
- Actions taken as a result of this review: As a result of this review, program faculty will utilize feedback from Accreditation, Assessment and Evaluation to improve measures of student learning outcomes at the graduate level and further differentiate these from student learning outcomes at the undergraduate level. Further, the program will continue to utilize information obtained from workshop and conference activities to improve the success of the students in the M.S. in Mechanical Engineering program and continue to utilize resources to facilitate graduate student travel to conferences and other leadership activities tied with professional associations, in order to ensure their success.

## **Outcome**

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Master of Science in Mechanical Engineering program has award-winning teaching faculty and increasing enrollments and degrees conferred. The program is working toward greater linkages between the assessment of student learning outcomes and continuous improvements efforts.

**Program:** B.S. in Technology (15.0000)

Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Technology program prepares students with a knowledge of engineering, mathematics, and technical management

to apply technical concepts in industrial settings. Students in the B.S. program have an opportunity to complete an emphasis in one of five areas: Electrical Engineering Technology, Manufacturing Engineering Technology, Industrial Management and Technology, Energy and Environmental Technology, and Applied Manufacturing Technology. This last emphasis is limited to transfer students who enter the program with an Associates of Applied Science degree with a major in a recognized technical area. Selecting this emphasis allows individuals who already hold some training in the field of technology to complete their B.S. program in a completely online format. According to the U.S. Bureau of Labor Statistics, individuals in the technology field work primarily in manufacturing but also find employment in sales, installation and repairs, transportation, and management and business operations.

- Major findings and recommendations: Enrollments in the B.S. in Technology have been steadily increasing from 370 FTE students in Fall 2013 to 428 FTE students in Fall 2017. Similarly, credit hour production has risen from 6,074 undergraduate credit hours produced in FY2013 to 7,521 in FY2017. Degrees conferred increased by 13 percent over the review period. Diversity in the program's graduates has increased over the review period, with the greatest increase seen among Hispanic students (50 percent increase between FY2012 and FY2016). Gender diversity remains limited with a student population that was 93 percent male in FY2016. Assessment of student learning outcomes within the program is exemplary and faculty use assessment data regularly to make data-informed decisions. Over the review period, alumni have reported an average of 70 percent employment within 6 months of graduation from the program. Faculty members have teaching loads of 3 classes each semester and excellent reputations for their teaching with several awards including two Presidential Engagement Professors.
- Actions taken since the last review: Faculty in the B.S. in Technology have made curricular changes since the last program review based on assessment data and feedback from NIU's Program Prioritization process in 2015-2016. Among these were the elimination of six underperforming minors and several courses that were undersubscribed. The faculty also modified the offering of general education courses and foundational courses in technology to better serve student needs. Other changes since the last review include the recent reaccreditation of the program in which the department was commended by ABET for assessment practices and the signing of ten Memorandums of Understanding with regional community colleges to increase the number of students in the "3+1" program for Applied Manufacturing Technology.
- Actions taken as a result of this review: As a result of this review, the program faculty are making a number of changes including upgrading the departmental website to better promote the B.S. in Technology program, hiring a program-specific advisor beginning in Fall 2018, considering new emphases in Mechatronics Technology and Computer Engineering Technology, and utilizing a departmental level space committee to identify laboratory space needs for each emphasis.

## Outcome

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Bachelor of Science in Technology program prepares students for a variety of careers in the field of technology. Enrollments are growing and the program offers a specific emphasis for individuals who already hold some training in the field of technology to complete their B.S. program in a completely online format. The program has a mature assessment system and uses data from the system for programmatic improvements.

**Program:** M.S. in Industrial Management (15.1501)

### Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Industrial Management program prepares students to be effective leaders in industry with skills in managing systems, problems and people. The program is offered fully online to provide broad access to students. The program is available to students with a baccalaureate degree in engineering, technology, or industrial education. The U.S. Bureau of Labor Statistics reports that the median salary for individuals with this position in 2017 was \$100,580. Little to no change in the occupational outlook is expected between 2016 and 2026.
- Major findings and recommendations: The program has strong ties with a multitude of manufacturing companies in the Northern Illinois region (over 5,000). Enrollments have remained relatively steady over the review period from 28 FTE students in Fall 2013 to 30 in Fall 2017. However, graduate credit hour production has decreased across the period from 806 credit hours produced in FY2013 to 578 in FY2017. Program representatives report that many students in the program work full-time and take only one or two courses a semester. Alumni of the program consistently report 100 percent satisfaction with the degree program. Data from the Delaware Cost Study show that the costs of the program are well below the mean costs of NIU's IPEDS peers.
- Actions taken since the last review: Program faculty have worked on several curricular initiatives, based on robust assessment data and reporting since the last review. These include: modifying the course rotation and advising so students take the same first course in the program (TECH 500) and the same final capstone course; adding courses on Maintenance Management and Construction Safety Management based upon needs in industry; deleting Graduate Certificates in Industrial Project Management, Industrial Workplace Design Systems, Systems Management, and Technical Logistics based feedback from NIU's Program Prioritization; and adding three new courses based on student and industry requests, Environmental Sustainability, Advanced Industrial Manufacturing, and Facilities Management.

- Actions taken as a result of this review: As a result of this review, faculty in the M.S. in Industrial Management program are embarking on several changes. For example, the program is working with NIU's Office of University Marketing and Creative Services to launch an advertisement campaign for the M.S. in Industrial Management. In an effort to increase graduate enrollment, the department is planning to develop an online Graduate Certificate program on Environmental Safety and Health. A program-specific advisor has been hired and will begin in Fall 2018.

## Outcome

- Decision:

  x   Program in good standing (review in six years to align with ABET accreditation cycle).

Explanation: The Master of Science in Industrial Management program has steady enrollments and is offered in a completely online format for student convenience. The program has a mature assessment system and uses data from the system for programmatic improvements.

**Program:** Doctor of Physical Therapy (51.2308)

## Major Findings and Recommendations:

- Major changes in the program: The Doctor of Physical Therapy (D.P.T.) program prepares students to function as entry-level physical therapists. Successful completion of the D.P.T. enables students to sit for the state licensure exam. The program provides a comprehensive scientific foundation, expertise in evidence-based practice, and a wide range of hands-on clinical experiences. Graduates find employment in clinics, hospitals, nursing homes, rehabilitation facilities, and private offices. The U.S. Bureau of Labor Statistics predicts employment of physical therapists will grow by 28 percent between 2016 and 2026, "much faster than the average for all occupations."
- Major findings and recommendations: The program has a 3-year graduation rate of 98 percent. Licensure pass rates and employment rates are in the upper 80 (86 or 87) to 90 (97) percent. Retention rates run from 97 to 100 percent over the five-year review period. Fewer than 12 percent of students are from racially diverse minorities. Faculty within the program have fewer published articles compared to their peers (at the 29<sup>th</sup> percentile) but have a higher rate of having citations from their articles (at the 96 percentile) per Academic Analytics data. Instructional costs of the program are well below peers per Delaware Cost Study data. This is due, in part, to a lower number of faculty in the program relative to program size. The program faces ongoing challenges with recruiting and retaining faculty.
- Actions taken since the last review: Since the last review, the program transitioned from the Master of Physical Therapy to the D.P.T. per changes in entry-level requirements in the field

of physical therapy. The first D.P.T. cohort was accepted in Fall 2010 and graduated in Spring 2013. To date, the program has accepted eight cohorts and has graduated 169 students in the years from 2013 to 2017. The transition to the D.P.T. degree included a complete review and revision of the student learning outcomes, the curriculum, course learning objectives, and the clinical education component.

- Actions taken as a result of this review: As a result of this review, the program has initiated a process to implement 1, 2 and 5-year plans of program and faculty development focusing on the following five areas: (1) increase in faculty scholarship productivity; (2) increase faculty retention and recruitment through exploring options including encouraging current clinical assistant professors to complete academic doctorates, creating permanent part-time positions for individuals with academic doctorates who have been long-term adjunct instructors; and recruiting from doctoral students in the Ph.D. in Health Sciences program; (3) further expanding opportunities in teaching, research, and aligned office space; (4) increasing engagement with alumni; and (5) diversifying the student body through means such as instituting the use of the Physical Therapy Centralized Application Service which will increase the number and diversity of applications for review, exploring increased interactions with community colleges and local universities that do not have a PT program, and considering implementing a freshman guaranteed admission program in partnership with NIU's Honors Program.

### **Outcome**

- Decision:

\_\_x\_\_ Program in good standing (review in eight years).

Explanation: The Doctor of Physical Therapy program has a strong demand and prepares students to work in a rapidly growing field. Retention, graduation, and licensure pass rates are all high.

**Program:** B.S. in Medical Laboratory Sciences (51.1005)

### **Major Findings and Recommendations:**

- Major changes in the program: The Bachelor of Science (B.S.) in Medical Laboratory Sciences program prepares students for science-based careers critical to health maintenance and disease diagnosis, treatments, and monitoring. As medical laboratory professionals, graduates evaluate and analyze medical samples and serve a critical role on health care teams; working in hospitals, clinics, diagnostics laboratories, and private physician offices. The rate of growth in the profession is projected to be 22 percent between 2012 and 2022 according to the Occupational Outlook Handbook. The B.S. in Medical Laboratory Sciences program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

- Major findings and recommendations: While enrollments in the B.S. in Medical Laboratory Sciences program have increased over the review period (from 54 students in Fall 2013 to 60 in Fall 2017), the number of students in pre-Medical Laboratory Sciences has decreased substantially during this same time period (from 40 in Fall 2013 to 26 in Fall 2017). It is recommended that the program address program expansion, particularly in maintaining the pipeline of highly qualified prospective students. Peer-reviewed journal articles produced by faculty are at the 16<sup>th</sup> percentile when compared with disciplinary peers nationwide (per Academic Analytics data). Instructional costs of the program are well below peers per Delaware Cost Study data. Both findings appear to be related, in part, to a heavy administrative burden on tenured/tenure-track faculty. Alumni express satisfaction with the B.S. in Medical Laboratory Sciences program (ranging from 80 percent to 100 percent over the review period). The program has a 90 percent employment rate. The site team for NAACLS, the program's accrediting body, reported in 2014 that the program was "a model for other programs throughout the university campus" and "excels in student engagement."
- Actions taken since the last review: In 2013, the program officially changed its name from Clinical Laboratory Sciences to Medical Laboratory Sciences to align with the American Society for Clinical Pathology's certification category of Medical Laboratory Sciences. In 2016, following a reorganization within NIU's College of Health and Human Sciences, the B.S. in Medical Laboratory Sciences program was moved to the School of Health Studies where it is currently housed with programs in Nutrition and Dietetics and Public Health. In addition, as of Fall 2017, students identified as pre-Medical Laboratory Sciences are now enrolled in the B.S. in Health Sciences program, Emphasis 2, while meeting their prerequisite courses for application to the Medical Laboratory Science major. The B.S. in Health Sciences program is housed within the School of Interdisciplinary Health Professions, where students who are considered "pre-professional" receive additional support and advising prior to applying for one of the health care professional programs including the B.S. in Medical Laboratory Science.
- Actions taken as a result of this review: Actions to be taken as a result of this review include both short- and long-term priorities related to expanding staff to support growth in the program and faculty scholarship. In terms of staffing, the responsibilities for program coordination for the B.S. in Medical Laboratory Sciences program, are being reassigned from a faculty member to a staff member to increase efficiency of student support and relieve administrative burden on tenured/tenure-track faculty. Additionally, a request for an additional faculty member will be put forth. In terms of program growth, efforts to recruit students, increase the number of clinical sites, and expand educational offerings will take place over the next 2-3 years with the assistance of alumni, employers of graduates, other NIU departments and community colleges. Implementation of the change in minimum GPA from 2.5 to 2.75 for program applicants sends consistent messaging of the quality of students in the program and program graduates. An update to the program website provides clear instructions for applying to the program both as a native NIU student and transfer student.



## Outcome

- Decision:

  x   Program in good standing (review in seven years in 2024-2025, in alignment with programmatic accreditation).

Explanation: The Bachelor of Science in Medical Laboratory Sciences has steady student demand with graduates who are employed and satisfied with the experiences they had in the program. The program has a plan in place for addressing the Academic Planning Council's recommendations to expand staff to support growth in the program and faculty scholarship.

**Program:** B.A./B.S. in Nonprofit and NGO Studies (44.0000)

### Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) in Nonprofit and NGO Studies program is one of the only freestanding, interdisciplinary undergraduate degree programs of its kind in the nation. The program prepares students to work in nonprofit organizations or in the fields of philanthropy, public service or community engagement. Typical graduates pursue careers in the public and nonprofit sectors in administration, program delivery, development/fundraising, and volunteer management. Students can select to pursue either a B.A. or B.S. degree. While the major requirements are the same for both credentials, students pursuing the B.A. fulfill a foreign language requirement and students pursuing a B.S. complete a laboratory science, mathematical, and computational sequence. According to the U.S. Bureau of Labor Statistics, the job outlook for social and community service managers is expected to grow by 18 percent, "much faster than average," between 2016 and 2026.
- Major findings and recommendations: Credit hour production and enrollments have been steadily increasing over the review period with 295 credit hours generated and 51 FTE enrolled in FY2013 and 815 credit hours and 80 FTE enrollments in FY2017. As students have moved through the program, degrees conferred have increased from 6 in FY2013 to 21 in FY2017. With few alumni, survey results from alumni are limited but of those who have responded, 85 percent have reported satisfaction with their degree. To date, assessment of student learning outcomes in the program have been limited. Recommendations to the program included obtaining feedback from alumni and employers, working to improve assessment processes and practices, and finding ways to highlight the uniqueness of the program.
- Actions taken since the last review: This was the first full program review for the Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) in Nonprofit and NGO Studies program.
- Actions taken as a result of this review: As a result of this review of the program, the following actions are being taken: (1) the director is collaborating with others on campus in

pursuing a grant from the Corporation of National and Community Service to conduct participatory action research with residents in a nearby low-income community; (2) program faculty have selected a research theme for 2018-2019, “Nonprofits Beyond the Cities;” (3) the program is working with Accreditation, Assessment, and Evaluation to improve assessment processes and practices; (4) an Alumni Club has been formed and held its first meeting; and (5) the program is in the process of developing an Advisory Council of nonprofit employers.

## Outcome

- Decision:

Program in good standing (review in eight years).

Explanation: Credit hour production and enrollments have been steadily increasing over the review period. Alumni report satisfaction with their degree. The program is working on improving assessment processes and practices and finding ways to highlight the uniqueness of the program.

**Program:** B.S. in Computer Science (11.0701)

### Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Computer Science program prepares students for employment in commercial, non-profit, or research sectors, or for graduate level studies in computer science. The program’s curriculum allows for emphases in three areas: software development, enterprise software, and computational software. Graduates of the program find jobs in several industries including information technology, banking and investment, manufacturing, energy, transportation, telecommunications, and consulting and business services. The U.S. Bureau of Labor Statistics predicts that the employment growth for software developers and computer systems analysts will grow 23 percent, “must faster than average,” during the period from 2012-2022. The program offers numerous opportunities for students to engage in extracurricular activities that complement the academic program. Among these are the Science, Technology, Engineering and Math Living-Learning Community and the Student Chapter of the Association for Computing Machinery.
- Major findings and recommendations: Undergraduate enrollment has risen dramatically in the last four years, growing from 397 in Fall 2012 to 597 in Fall 2016, or just slightly more than 50 percent growth. Credit hour generation has grown 31 percent during that same time period from 7,842 credit hours in Fall 2012 to 10,279 credit hours in Fall 2016. The high-performance computer cluster, Gaea, and the associated Center for Research and Computing and Data (CRCD) have provided increased research opportunities for faculty, students, and colleagues at Argonne and Fermilab. The number of women in the professoriate in the Department of Computer Science (32 percent) surpasses the national average in this field (21

percent). Recommendations were made to the program representatives to continue plans to update the program's curriculum, specifically to explore offering a Certificate in Cybersecurity.

- Actions taken since the last review: Since the previous program review, the department has had a net loss of two faculty members, despite growing enrollments. Two faculty hires have recently been approved. The program has suspended direct assessment of student learning outcomes. At this time, assessment of student learning outcomes is limited to two indirect methods, employer survey and alumni survey. The program representatives are recommended to work with Accreditation, Assessment and Evaluation to expand these assessment methods, specifically to include some direct methods.
- Actions taken as a result of this review: The program plans to undertake a comprehensive review of the curriculum and revise the curriculum as deemed appropriate. Part of that review will include an assessment of the demands for instruction in cybersecurity, identifying student learning outcomes designed to meet those demands, and considering the courses, teaching corps, and facilities (e.g., laboratories) needed to achieve those outcomes. The department will work with Accreditation, Assessment and Evaluation to consider new assessment methods.

## **Outcome**

- Decision:

\_\_\_x\_\_\_ Program in good standing (review in eight years with a follow-up on assessment submitted as a Mid-Status report to the University Assessment Panel in 2021-2022).

Explanation: The Bachelor of Science in Computer Science program provides quality education that meets student needs and student numbers have increased over the review period. The program is investing in ongoing evaluation of programmatic quality and assessment of student learning.

**Program:** M.S. in Computer Science (11.0701)

Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Computer Science program prepares students with programming and design skills as well as an understanding of theoretical and intellectual concepts to provide the basis for further acquisition of new knowledge and skills as the computer science field places a demand on graduates for life-long, self-learning. The curriculum includes a survey course on current research and technical development in computer science, as well as coursework in programming, computer systems, theory and specialized areas. Students choose from one of four specializations: data analytics, graphics and visualization, high performance computing, or bioinformatics.

- Major findings and recommendations: Demand for the M.S. in Computer Science remains strong. The program has granted 618 M.S. degrees since Fall of 2010. Over half of those (363) were granted in the last three years of the review period. The percentage of degrees granted by the department to women has increased from 25 percent in 2010-2011 to 35 percent in 2016-2017. These numbers match national trends in the discipline as reported by the National Center for Education Statistics. In comparison to peer institutions, the program faculty excel in grant activity (in the 91<sup>st</sup> percentile) but fall below their peers in numbers of peer-reviewed journal articles produced (in the 23<sup>rd</sup> percentile) per Academic Analytics data. Costs per credit hour were below peers (per Delaware Cost study data), offering a quality program at a reasonable cost. Alumni consistently report that they are well prepared for their jobs (94 to 100 percent agreement). Assessment of the student learning outcomes was found to be limited.
- Actions taken since the last review: Since the last review, the department's professoriate embarked on a comprehensive review of the M.S. program. After determining that a significant revision was appropriate, the program was modernized to reflect the contemporary landscape in computer science to continue to prepare graduate students for rewarding careers in computer science and to better align with and allow for more engagement with faculty research. The review also led the department to put forth a proposal for a Ph.D. in Computer Science which has subsequently been approved at all levels of the university and by the Illinois Board of Higher Education. This program will commence in Fall 2018.
- Actions taken as a result of this review: As a result of NIU's Program Prioritization process as well as this comprehensive program review, the department is continuing to actively participate and contribute in a campus-wide effort to define, create, and deliver interdisciplinary program(s) in data sciences. The department also plans to work with Accreditation, Assessment and Evaluation in enhancing its assessment plan for the M.S. in Computer Science.

## Outcome

- Decision:

    x Program in good standing (review in eight years with a follow-up on assessment submitted as a Mid-Status report to the University Assessment Panel in 2021-2022).

Explanation: The Master of Science in Computer Science program provides a quality program at a reasonable cost. Alumni consistently report that they are well prepared for their employment. The program is investing in ongoing evaluation of programmatic quality and assessment of student learning.

**Program:** B.A./B.S. in Geography (45.0701)

Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) in Geography program engages students in the exploration of geographic conditions that influence everything from a region's economy to its social devolvement. Graduates of the program are prepared to take on a number of employment opportunities including managing natural and urban environments, planning transportation routes, and creating geographic management systems for industries and government agencies. Students in the program can either elect to earn a B.A. or a B.S. degree. Students who elect to earn the B.A. complete a foreign language requirement. Students pursuing the B.S. complete a laboratory science, mathematical, and computational skills sequence. Students select from one of two emphases, Geography or Geomatics. Those students selecting the Geomatics Emphasis must complete the B.S. degree program requirements. The U.S. Bureau of Labor Statistics reports that careers in geographers are predicted to grow 7 percent (as fast as average) from 2016-2026. The Bureau also reports that careers in fields related to geomatics are predicted to grow 19 percent (much faster than average) during this same time period.
- Major findings and recommendations: The program underwent both internal and external review. External reviewers reported a fundamental concern that the primary building used by all of the programs in the Department of Geographic and Atmospheric Sciences, "has a variety of severe deficiencies that need remediation for the department to function more effectively." Specifically related to the B.A./B.S. in Geography program, the external reviewers noted that, "departmental recruitment efforts have not kept pace with the changing 'playing field.' Adjustments that will enable faculty to actively meet with teachers and prospective students at more of the regional community colleges seem appropriate. Career Day, the department's successful effort to connect students with alumni and employers is important in recruiting career-oriented students." Enrollments in the program have remained relatively steady over the review period from 35 FTE students in Fall 2013 to 39 FTE students in Fall 2017. However, declining enrollments overall within the NIU undergraduate student population has led to concerns over continued enrollments. It is recommended that the program faculty work to differentiate NIU's program from competitors and better publicize NIU's program comparative advantage over competing programs.
- Actions taken since the last review: Since the last review, program faculty have taken on a number of new initiatives. For example, the Geomatics Emphasis was added to the B.S. program. This emphasis, one of only three available in Illinois, is focused on students interested in the career field of land surveying. Enrollments in this emphasis had grown to about 15 majors by 2016-2017. A Geographic Information Systems (GIS) Team was developed in 2016 to provide continual evaluation of and improvement to the GIS undergraduate certificate. An annual department undergraduate research and map competition began in 2014 and a Geography Club was developed and is supported by a faculty mentor. A Student Advisory Committee was re-activated within the department. Five students meet with the chair three times a semester to discuss departmental issues pertaining to the student experience.

- Actions taken as a result of this review: One of the primary steps taken as a result of this review has been the initiation of discussions with other units on campus about the possible creation of a School of Earth and Environmental Sciences. If realized, the school could allow for greater interdisciplinary efforts between students, staff, and faculty in teaching, research, and outreach. For example, faculty could be hired to teach in two or more units and programs, leading to greater flexibility in covering courses in existing programs. The B.A./B.S. in Geography program, as well as B.A./B.S. programs in the other units, would likely reside in this new administrative unit. Actions taken specifically related to the B.A./B.S. in Geography program as a result of this review include working to enhance student “pipelines” from regional high schools and community colleges to NIU, working with alumni who serve on the Geography External Advisory Panel and attend the department’s annual Career Day event to increase their interactions with current and prospective students, and participating in more outreach efforts where prospective students and parents become more aware of the geography major and how it is integrated into many careers.

## Outcome

- Decision:

\_\_x\_\_ Program in good standing (review in eight years).

Explanation: The Bachelor of Arts and Bachelor of Science in Geography program prepares students for employment in growth industries, has had steady enrollments despite the decline in overall university enrollments, and engages in continuous program improvement efforts.

**Program:** M.S. in Geography (45.0701)

Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Geography program trains students to make substantive contributions to society in roles as scientists, educators, and managers. Graduates of the program are also prepared to go on to further graduate study. In consultation with their advisors, students choose to complete a thesis or non-thesis option. Faculty mentors work with students in the areas of urban geography, economic geography, medical geography, energy geography, fluvial geomorphology, climatology, meteorology, natural hazards, soil science, biogeography, environmental management, and geographic information science. The U.S. Bureau of Labor Statistics reports that careers for geographers are predicted to grow 7 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: As noted in the B.A./B.S. in Geography program review, the department underwent an external review and the external reviewers reported a fundamental concern regarding the deficiencies of the primary building used by all of the programs in the Department of Geographic and Atmospheric Sciences. In addition, specifically related to the M.S. in Geography program the reviewers stated that, “the external

grants and contracts obtained in the Geovisual Mapping Laboratory are a shining star for Northern Illinois University. The resulting contract work provides state-of-the-art equipment and software, employs students in modern mapping, and trains them for the modern work force.” Alumni report high levels of satisfaction with the program, ranging from 94 to 95 percent across the review period. However, enrollments and degrees conferred have dropped over the review period. In Fall 2013, the M.S. program enrolled 24 FTE students and conferred 10 degrees in FY2013, compared to 15 FTE students enrolled in Fall 2016 and 8 conferred degrees in FY2016. It is recommended that the program explore interdepartmental collaborations and opportunities for online classes or other delivery methods to increase enrollments.

- Actions taken since the last review: Program faculty have taken on several new initiatives since the last program review. Among these, the program has replaced the required “Concepts in Geography” course with the “Practices in Geography” course. This new course has a stronger focus on developing student oral presentation and written communication skills. The program has enhanced the role of the department’s Graduate Coordinator allowing this individual to play a more pro-active role in ensuring students complete their graduate program in a timely fashion. The Graduate Coordinator now conducts an “exit interview” with all M.S. students and provides assessment data from these interviews to the department chair and faculty. Annually, program faculty revise the department’s graduate student handbook to maintain the most up-to-date information on Graduate School and program requirements and learning opportunities. The program created a graduate student computer research laboratory.
- Actions taken as a result of this review: As discussed in the review of the B.A./B.S. in Geography program, one of the primary steps taken as a result of this review has been the initiation of discussions with other units on campus about the possible creation of a School of Earth and Environmental Sciences. All graduate students within the School would have greater opportunities to become involved in interdisciplinary research by selecting committee members from across all units. The School may develop research clusters around research pillars (e.g., changes in demographics, changes in climate, changes in technology, etc.). Actions taken specifically related to the M.S. in Geography include embarking on a new marketing plan with college staff and creating hard copy as well as marketing information on the department’s social media sites. Much of the information will focus on cutting edge faculty/graduate student research endeavors, highlighting the department’s Geovisual Mapping Lab and the projects associated with this lab which provide hands-on learning activities for M.S. students. The program faculty are also considering the potential development of an online one-year Professional M.S. in Applied Geography. Further, program faculty and staff are planning to discuss a possible online M.S. program at a Fall 2018 Faculty Retreat.

## **Outcome**

- Decision:  
 Program in good standing (review in eight years).

Explanation: The Master of Science in Geography has an outstanding Geovisual Mapping Laboratory for hands-on learning experiences for students and is actively exploring ways to increase the utility of existing university resources and provide greater flexibility in program formats for students.

**Program:** Ph.D. in Geography (45.0701)

Major Findings and Recommendations:

- Major changes in the program: The Doctor of Philosophy (Ph.D.) in Geography program prepares scholars and professionals in geography. Students work closely with faculty who specialize in urban geography, economic geography, medical geography, energy geography, fluvial geomorphology, climatology, meteorology, natural hazards, soil science, biogeography, environmental management, and geographic information science. Students complete an approved independent research project and prepare a dissertation. The U.S. Bureau of Labor Statistics reports that careers for geographers are predicted to grow 7 percent (as fast as average) from 2016-2026.
- Major findings and recommendations: As noted in the B.A./B.S. and M.S. in Geography program reviews, the department underwent an external review and the external reviewers reported a fundamental concern regarding the deficiencies of the primary building used by all of the programs in the Department of Geographic and Atmospheric Sciences. Specifically related to the Ph.D. in Geography program, the reviewers stated that the “quality of the faculty is a departmental strength. The program produces students that win awards when they share their scholarship.” They recommended that, “aggressive recruitment in the Chicago area and increased stipends are needed to improve the quality and quantity of the graduate students enrolled.” Enrollments in the Ph.D. program have been relatively consistent since its inception in 2010. In Fall 2013, there were 10 FTE students enrolled in the program and in Fall 2017, there were 12 such students. Program faculty engage in continuous improvement efforts grounded in data on student learning outcomes assessment. Faculty in the Ph.D. program are productive in research and scholarship. According to Academic Analytics data, the number of peer-reviewed journal articles per faculty compared to IPEDS peers is in the 63<sup>rd</sup> percentile and the number of grant dollars per faculty compared to IPEDS peers is in the 67<sup>th</sup> percentile.
- Actions taken since the last review: This was the first full program review for the Ph.D. in Geography program.
- Actions taken as a result of this review: As discussed in the review of the B.A./B.S. and M.S. in Geography program, one of the primary steps taken as a result of this review has been the initiation of discussions with other units on campus about the possible creation of a School of Earth and Environmental Sciences. Actions that will be taken that are specific to the Ph.D. in Geography program will focus on major issues facing the Ph.D. program, increasing Graduate Assistant (GA) stipends, and expanding recruitment efforts. With NIU’s



GA stipends falling below those in similar sized universities, the program is optimistic that a new School might reduce costs and enable an increase in GA stipends, thereby enabling the program to better compete for excellent Ph.D. students. The department and program also have plans to embark on a marketing plan with college staff. Doctoral students generally come to NIU because of its location relative to Chicago and the reputation of its research faculty. Increased marketing efforts and higher GA stipends can attract more students to the Ph.D. program.

## Outcome

- Decision:

\_\_x\_\_ Program in good standing (review in eight years).

Explanation: The Doctor of Philosophy in Geography has productive faculty, consistent enrollments, and engages in continuous improvements efforts grounded in data on student learning outcomes assessment.

## Program: B.S. in Meteorology (40.0401)

### Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Meteorology program trains students in atmospheric sciences, including weather and climate, and how those conditions affect human activity and the earth, in general. Most meteorologists work in weather stations, offices, or laboratories. The U.S. Bureau of Labor Statistics predicts that careers in atmospheric sciences, including meteorology, are predicted to grow 12 percent (faster than average) from 2016-2026. NIU's B.S. in Meteorology program meets standards established by the American Meteorological Society for an undergraduate degree in atmospheric science and federal civil service requirements for meteorologists.
- Major findings and recommendations: As noted in the findings for the programs in geography, the department underwent an external review and the external reviewers reported a fundamental concern regarding the deficiencies of the primary building used by all of the programs in the Department of Geographic and Atmospheric Sciences. Specifically related to the B.S. in Meteorology program, the reviewers stated that the "Career Day is a hallmark of the department. Given the mindset of the majority of graduates that their academic training was really important, more can always be done to connect with alumni." Enrollments in the B.S. in Meteorology program have declined in recent years. In Fall 2013, the program enrolled 68 FTE students compared to 50 FTE students in Fall 2017. Faculty in the area of atmospheric sciences and meteorology are slightly less productive than their IPEDS peers, according to Academic Analytics data. Peer-reviewed journal articles per faculty and grant dollars per faculty are both in the 40<sup>th</sup> percentile. However, citations per faculty are in the 60<sup>th</sup> percentile, indicating a higher quality of articles. Program faculty have a long and well-established practice of utilizing assessment of student learning data for program improvement.

- Actions taken since the last review: Since the last program review for the B.S. in Meteorology program, program faculty have undertaken several initiatives. For example, the program curriculum was revised by adding a required radar meteorology course, replacing one of the required synoptic meteorology courses with a mesoscale meteorology course, adding two 1-credit hour weather forecasting practicum courses, adding a Python computer programming course as an option to C++, and reducing the number of elective hours required for the degree from nine to six. These changes were enacted to enhance the students' abilities to forecast weather at various temporal and spatial scales using state-of-the-art technology. Program faculty continued to develop contacts with weather-sensitive industries and organizations. These often led to course-related projects, internships and career opportunities for students in the programs. To better equip students with communication skills needed in their careers, the program faculty also increased the number of upper-division courses that required writing and oral communication.
- Actions taken as a result of this review: As discussed in the review of the programs in geography, one of the primary steps taken as a result of this review has been the initiation of discussions with other units on campus about the possible creation of a School of Earth and Environmental Sciences. Actions that will be taken that are specific to the B.S. in Meteorology include working toward increasing enrollment in the program through enhancing the "pipeline" of community college students. In addition, the program faculty will continue to capitalize on the unique aspect of the B.S. in Meteorology program that effectively links students into multiple internship opportunities through an active alumni network in the Northeast Illinois region. Future marketing efforts will focus more attention on this unique activity. Further, the program will request additional feedback from its External Advisory Panel and those who attend the annual Career Day event to improve the program. In addition to providing resources and support to the B.S. in Meteorology program (e.g., financial, time, internships, etc.), these individuals also represent the external face of the program, thus often acting as the best marketing tool for the program.

## Outcome

- Decision:

\_\_\_x\_\_\_ Program in good standing (review in eight years).

Explanation: The Bachelor of Science in Meteorology program has strong links to internship sites for students in the Northeast Illinois region, engages in continuous improvements efforts grounded in data on student learning outcomes assessment, and has recruitment plans to increase enrollments.

**Program:** B.S. in Geology and Environmental Geosciences (40.0601)

Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Science (B.S.) in Geology and

Environmental Geosciences prepares students to perform geoscience work in a wide variety of positions in research, industry, government, academia, and nonprofit organizations. Students in the program receive faculty mentoring with research that enables students to have hands-on experiences with collecting, evaluating and interpreting original data, and applying technology to problem-solving. Students in the program choose from one of three emphases: (1) Geology, for students planning careers as professional geologists; (2) Environmental Geosciences, for students seeking a broad scientific base for careers in professions that utilize environmental knowledge such as land-use planning, law, political science or economics; and (3) Earth and Space Science Education, for students planning to pursue initial educator licensure to teach grades 6-12. The U.S. Bureau of Labor Statistics reports that careers in geosciences are predicted to grow 14 percent (faster than average) from 2016-2026.

- Major findings and recommendations: The program underwent both internal and external review. External reviewers reported that “the faculty are dedicated to providing a high-quality undergraduate education that is engaging and experiential-learning based.” They also pointed out that the teaching and research facilities of the Department of Geology and Environmental Geosciences has “pervasive and persistent infrastructure problems...that must be addressed as soon as possible.” Student demographics are consistent with national discipline trends with approximately 30 percent of the students in the program being female and 6 percent coming from underrepresented groups. Over half of the B.S. students (55 percent) engage in an undergraduate research project and 12 percent elect to complete a senior thesis. Collection and use of assessment data on student learning outcomes is aligned with program improvement initiatives. Alumni report high levels of satisfaction with their degree experience, consistently above 90 percent. Enrollments in the B.S. program and credit hours have declined. In 2013, the program had 81 FTE students enrolled and delivered 5,853 credit hours and in 2016, the program had 48 FTE students enrolled and delivered 3,826 credit hours. With declining enrollments over the review period, it is recommended that the program faculty work on marketing efforts and strategies, and continue efforts to development modules for field schools that make them more accessible for non-traditional students.
- Actions taken since the last review: Since the last review, the program has undertaken several quality improvement initiatives. For example, one faculty member conducted an NSF-sponsored project, Geo-Needs, to identify barriers and opportunities to enhance geoscience instruction at 2-year colleges and Minority Serving Institutions. Successful practices for increasing diversity in the geosciences identified in this study were implemented in the B.S. program. The program faculty have also modified the pedagogy of GEOL 120, a lower division general education course, to better serve the needs of students. Included among these modifications are the use of interactive software that enables students to use smartphones, tablets and computers to engage with the instructor and provide real-time assessment of student learning. Other changes include the creation of engaged learning modules and the use of reformed teaching methods such as think-pair-share and concept mapping.
- Actions taken as a result of this review: Three of the primary findings from this review are: (1) continuing loss of faculty, (2) facilities support and infrastructure deterioration, and (3)

declining enrollment. The program representatives noted that these require increased investment by the university in addition to actions that can be taken by the program alone. That said, as a result of this review of the program, the program has initiated new and enhanced marketing of introductory level courses with plans to enlist the aid of media services in this effort, has submitted several curricular changes to make the major more attractive to potential students, is in the process of converting the program's 6-week and 4-week summer field schools into a series of 2-week modules that provide non-traditional students with greater flexibility in scheduling these required courses, and has plans to offer course credit in professional training and certification in Hazardous Waste Operations and Emergency Response.

## Outcome

- Decision:

\_\_x\_\_ Program in good standing (review in eight years).

Explanation: The Bachelor of Science in Geology and Environmental Geosciences has productive faculty, satisfied alumni, and engaging teaching methods based on assessment of student learning outcomes. Improvements are underway to address declining enrollments.

**Program:** M.S. in Geology (40.0601)

### Major Findings and Recommendations:

- Major changes in the program: The Master of Science (M.S.) in Geology prepares students to design and conduct quality research, effectively communicate the results of that research, and successfully compete for a wide variety of jobs in the private, academic, and government employment sectors, or go on to further study leading to a doctorate. The U.S. Bureau of Labor Statistics reports that careers in geosciences are predicted to grow 14 percent (faster than average) from 2016-2026.
- Major findings and recommendations: The program underwent both internal and external review. External reviewers reported that, "the graduate program compares very favorably with those programs in departments of comparable size and strengths nationwide... the curriculum is very much aligned with disciplinary norms in terms of both depth and breadth of course offerings. The job market, including the relatively local job market, remains strong and it appears that students are quickly employed in the discipline upon and even before graduation." They also expressed concern about what they termed a "tax" on graduate students in the form of fees. "We learned that the cost of 'fees' required to be paid each semester, which the students must pay out of their own pocket is some \$1,255. Both external reviewers have never heard of such a 'tax' on graduate students." Faculty in the program are well accomplished in their teaching, scholarship, and service. Two faculty members are two-term, NIU Board of Trustees Professors, three are Fellows in the Geological Society of America, and one is an Illinois Licensed Professional Geologist. Collection and use of

assessment data on student learning outcomes is aligned with program improvement initiatives. Alumni report high levels of satisfaction with their degree experience, consistently 100 percent over the review period. Enrollments in the M.S. program have declined. In 2013, the program had 34 FTE students enrolled and in 2016, the program had 29 FTE students enrolled. With declining enrollments over the review period, it is recommended that the program increase recruitment efforts outside of the NIU undergraduate student population (currently 30 percent of the M.S. students are recruited from NIU).

- Actions taken since the last review: In alignment with continuous quality improvement, the program faculty have undertaken quality initiatives including the following example. In 2012, the program created a 1-credit hour graduate seminar, GEOL 501, that is required for all beginning graduate students. This course is designed to help students transition into graduate school, and covers topics ranging from laboratory safety to professional ethics, relationships with advisors, research project design and execution, professional writing, time management, and literature research. The principal product students create is a research proposal which undergoes multiple rounds of peer and instructor review. Many students choose to submit their proposal to professional organizations (e.g., Geological Society of America) that provide competitive funding for graduate student research. Since 2012, the M.S. students have won nearly \$64,000 in external, competitive funding.
- Actions taken as a result of this review: As noted with the B.S. program, there are three primary findings from this review: (1) continuing loss of faculty, (2) facilities support and infrastructure deterioration, and (3) declining enrollment. As a result of this review, the program is advocating across the institution for a reduction in graduate student fees. The program faculty believe that removing or reducing these fees will make the program more competitive for high quality M.S. students. The program is also increasingly recruiting students from outside NIU. The program is investing in renting recruitment booths at national and regional conferences and hopes to see these investments bear fruit in future applicant pools.

## Outcome

- Decision:

  x   Program in good standing (review in eight years).

Explanation: The Master of Science in Geology has productive faculty, highly satisfied alumni, and engages in continuous improvements. Initiatives to expand recruitment pools are in progress.

**Program:** Doctor of Philosophy (Ph.D.) in Geology (40.0601)

Major Findings and Recommendations:

- Major changes in the program: The Doctor of Philosophy (Ph.D.) in Geology prepares

students to design and conduct quality research, effectively communicate the results of that research, and successfully compete for a wide variety of jobs in the private, academic, and government employment sectors. Doctoral students develop their scientific knowledge and skills and collaborate with a faculty advisor to design, develop and execute an original research project and prepare a dissertation. Doctoral students are also required to intern for a minimum period of one semester in a geoscience setting with industry, a public or private research organization, or a government agency. The U.S. Bureau of Labor Statistics reports that careers in geosciences are predicted to grow 14 percent (faster than average) from 2016-2026.

- Major findings and recommendations: The program underwent both internal and external review. External reviewers reported that, “the research productivity of the faculty over the past five years is excellent in both quality and quantity of contributions...research results are published in primarily top-tier journals and receive media and professional coverage (the listing of faculty Antarctic research by Science as one of the top ten scientific breakthroughs of 2014 is exemplary).” Data from Academic Analytics further supports that faculty in the program are highly productive with grant dollars per faculty at the 63 percentile when compared to IPEDS peers. Alumni report high levels of satisfaction with their degree experience, ranging from 94 percent to 100 percent over the review period. Enrollments in the Ph.D. program are low and declined during the review period from 6 FTE students in Fall 2012 to 3 in Fall 2015. There does appear to be an upturn in recent years with 8 FTE students enrolled in Fall 2016. However, there is some concern with the numbers of degrees conferred that do not appear to be keeping pace with the enrollments. Only two degrees have been conferred in the review period. It is recommended that the program carefully track student progress through the program to identify key issues that may lead students to leave the program and use continuous improvement initiatives to further engage students.
- Actions taken since the last review: As discussed in the review of the M.S. program, the department created a new course, GEOL 501, required for all graduate students which, among other things, helps students hone their research proposal writing skills. The program faculty have recommitted to embedding more technical writing into the training of Ph.D. students and instituted a departmental policy that strongly encourages dissertation advisors to encourage Ph.D. students to publish at least one peer-reviewed paper prior to graduating. In response, students have submitted more papers for publication (20 were published in the last decade), and have also submitted more and better research proposals, winning \$54,600 in competitive, external funding just since 2012. Two students wrote successful proposals that earned them funding to serve as shipboard scientists on prestigious, one- to two-month long research cruises conducted by the International Ocean Discovery Program (IODP).
- Actions taken as a result of this review: As noted with the B.S. and M.S. programs, there are three primary findings from this review: (1) continuing loss of faculty, (2) facilities support and infrastructure deterioration, and (3) declining enrollments. The program faculty have, and will continue to, make concerted efforts to recruit high quality Ph.D. students which is starting to pay dividends – the program has attracted and enrolled more students in the last two years than in the past five years combined. The program faculty plan to revise the Ph.D. assessment plan to facilitate better tracking of student progress through the program and to

identify key issues that may lead students to leave the program. An Alumni Advisory Board will be formed to offer mentorship to Ph.D. students and better prepare them for the job market after graduation.

## Outcome

- Decision:

  x   Program in good standing (review in eight years).

Explanation The Doctor of Philosophy in Geology has productive faculty, highly satisfied alumni, and engages in continuous improvements. Initiatives to better track progress of and engage doctoral students are in place.

**Program:** B.A./B.S. in Environmental Studies (3.0103)

### Major Findings and Recommendations:

- Major changes in the program: The Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) in Environmental Studies program prepares students to meet environmental challenges on a local, regional, and/or global level. Students analyze solutions to energy demands; assess the impact of environmental, climactic, and energy challenges facing society; and learn how to promote sustainability and the policies surrounding it. Students can select to pursue either a B.A. or B.S. degree. While the major requirements are the same for both credentials, students pursuing the B.A. fulfill a foreign language requirement and basic requirements in mathematics, statistics, and chemistry; students pursuing the B.S. have more rigorous requirements in mathematics, statistics, and chemistry. Students in the B.A./B.S. in Environmental Studies program may select from six emphases: Biodiversity and Environmental Restoration, Energy Studies, Nature in Society, Environmental Policy, Water Sciences, or Educator Licensure – Environmental Science. According to the U.S. Bureau of Labor Statistics, the job outlook for environmental scientists and specialists with a bachelor’s degree is expected to grow by 11 percent, “faster than average,” between 2016 and 2026.
- Major findings and recommendations: Credit hour production and enrollments have been steadily increasing over the review period with 948 credit hours generated and 100 FTE enrolled in FY2013 and 1025 credit hours and 109 FTE enrollments in FY2017. As students have moved through the program, degrees conferred have increased from 8 in FY2013 to 36 in FY2017. With few alumni, survey results from alumni are limited but of those who have responded, 92 percent have reported satisfaction with their degree. The program relocated in Fall 2017 to Montgomery Hall, a more accommodating environment than the previous location, enabling more interaction among faculty, staff, and students, particularly beneficial for collaboration in undergraduate research projects. To date, assessment of student learning outcomes in the program have been limited. The program is recommended to work with Accreditation, Assessment, and Evaluation to improve assessment processes and practices.

- Actions taken since the last review: This was the first full program review for the Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) in Environmental Studies program.
- Actions taken as a result of this review: As a result of this review, the program is working on a new assessment plan that is being coordinated by the assistant director and all faculty who teach in the program. An element of this plan is increased feedback from alumni and employers of graduates. The program has revised its website to highlight alumni achievements and increased the online presence of its sustainability activities on campus. The unit continues to work toward increasing interdisciplinary collaborations with other units across the university.

## Outcome

- Decision:

\_\_x\_\_ Program in good standing (review in eight years).

Explanation: Credit hour production and enrollments have been steadily increasing in the Bachelor of Arts and Bachelor of Science in Environmental Studies program over the review period. Alumni report satisfaction with their degree. The program is working on improving assessment processes and practices.

**Center:** Microelectronics Research and Development Laboratory

Major Findings and Recommendations:

- Major changes in the program: The Microelectronics Research and Development Laboratory (MRDL) is one of 12 laboratories housed within the Department of Electrical Engineering within the College of Engineering and Engineering Technology. The MRDL is a teaching and research facility specializing in semiconductors and hybrid microelectronic device fabrication. Along with the other labs in the department and the college, the MRDL is designed to offer hands-on learning opportunities for students and research facilities for faculty. It appears to be an historical artifact that this lab is included in the program review cycle where all other laboratories in the department and college are not included. At this time, the Illinois Board of Higher Education does not consider the MRDL as a formal center, nor is it considered a formal research center by NIU's Division of Research and Innovation Partnerships.
- Major findings and recommendations: The MRDL provides good training and hands-on opportunities for engineering students and has served over 500 students in the past six years. Faculty affiliated with MRDL have had high journal publication records and there has been an increase in external funding and equipment donations during the review period. The MRDL will interact with faculty and students from two new degree programs, the B.S. in Biomedical Engineering and the B.S. in Mechatronics Engineering, providing more engaging opportunities for MRDL with industry and federal agencies for development and design of biomedical sensors and Microelectromechanical Systems.



- Actions taken since the last review: The last review for the MRDL was conducted in 2008-2009. Since that time, the MRDL has acquired new equipment and research funding. While initially conceived of as a potential formal research center within NIU, the MRDL has served a critical function in the area of providing hands-on learning opportunities and training for students.
- Actions taken as a result of this review: Moving forward, the MRDL looks to use the lab for training engineers in microelectronic fabrication for a fee; as an incubator for small companies; and as an opportunity to collaborate with a major corporation, to include funding, in a naming opportunity and/or significant usage agreement.

## **Outcome**

- Decision:

  x   Center is in good standing (no further review will be conducted).

Explanation: Although the Microelectronics Research and Development Laboratory was found to be in good standing, it is not considered a formal center by the Illinois Board of Higher Education or considered a formal research center by NIU's Division of Research and Innovation Partnerships. Therefore, it will be removed from the program review cycle moving forward.