

REVIEW OF THE B.S. IN MEDICAL LABORATORY SCIENCE

Classification of Instructional Programs (CIP) Code: 51.1005
Clinical Laboratory Science/Medical Technology/Technologist

OVERVIEW

The B.S. in Medical Laboratory Science program at Illinois State University is housed in the Department of Health Sciences within the College of Applied Science and Technology. The department also offers undergraduate minors in Environmental Health, Health and Wellness Coaching, Public Health, and Safety; a B.S. in Environmental Health; a B.S. in Health Information Management; a B.S., B.S.Ed. in Health Promotion and Education; and a B.S. in Safety. The Department of Health Sciences does not offer graduate programs. The B.S. in Medical Laboratory Science, B.S., B.S.Ed. in Health Promotion and Education, and B.S. in Safety programs were reviewed in this 2018-2019 program review cycle, while the B.S. in Environmental Health and the B.S. in Health Information Management programs were reviewed in 2017-2018. The last review of the B.S. in Medical Laboratory Science program occurred in 2010-2011.

The B.S. in Medical Laboratory Science program is dedicated to preparing students for productive and rewarding careers as medical laboratory scientists (sometimes called clinical laboratory scientists). Through a curriculum developed to meet standards of the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), the program strives to graduate students who are technically competent and compassionate practitioners. Medical laboratory scientists analyze body fluids and perform tests using highly specialized equipment to diagnose diseases and monitor medical treatment. They are typically employed in hospitals, private clinical laboratories, and industry. Some states require medical laboratory personnel to be licensed, but that is not the case in Illinois. However, employers typically prefer to hire medical laboratory specialists who have passed a national certification examination. By closely following NAACLS standards, the B.S. in Medical Laboratory Science program at Illinois State prepares its students for national certification.

The program is one of three medical laboratory science programs in Illinois accredited by NAACLS and offering a full medical laboratory science curriculum. In all other medical laboratory science programs in the state, students must transfer to a hospital-based program at another institution to complete advanced coursework and clinical experiences.

Enrollment and Degrees Conferred, 2011-2018

B.S. in Medical Laboratory Science, Illinois State University

First Majors Only

	2011	2012	2013	2014	2015	2016	2017	2018
Enrollment, fall census day	101	93	104	112	95	112	114	121
Degrees conferred, graduating fiscal year	19	27	23	35	28	28	30	30

Table note:

Graduating Fiscal Year consists of summer, fall, and spring terms, in that order. For example, Graduating Fiscal Year 2018 consists of the following terms: summer 2017, fall 2017, and spring 2018.

EXECUTIVE SUMMARY PROGRAM REVIEW SELF-STUDY REPORT

Program goals

The goal of the B.S. in Medical Laboratory Science program is to prepare qualified medical laboratory scientists for service in medical, public health, research, and industry settings. The program seeks to imbue students with entry-level professional competencies: knowledge of safety and governmental regulations, appropriate professional behavior, abilities to communicate effectively with patients and other medical personnel, principles of management, educational methodologies, and principles of research design.

Students learning outcomes

At entry level, a graduate of the B.S. in Medical Laboratory Science program will have basic knowledge and skills in ...

- Application of safety and governmental regulations and standards as applied to clinical laboratory science.
- Principles and practices of professional conduct and the significance of continuing professional development.
- Communications sufficient to serve the needs of patients, the public, and members of the health care team.
- Principles and practices of administration and supervision as applied to clinical laboratory science.
- Educational methodologies and terminology sufficient to train/educate users and providers of laboratory science.
- Principles and practices of clinical study design, implementation, and dissemination of results.
- Theoretical knowledge and technical skills in the areas of clinical chemistry, hematology/hemostasis, immunology, immunohematology/transfusion medicine, microbiology, urine and body fluid analysis, laboratory operations, and the ability to integrate and interpret data.

Program curriculum (2018-2019)

Graduation requirements:

120 credit hours consisting of 50 credit hours in required Health Sciences courses, 12-13 credit hours in specified courses offered by other academic units, 39 credit hours in courses that meet General Education requirements (including 12 credit hours in General Education courses specified by the program), and 8 credit hours in elective courses related to the field, with the balance earned by completing other elective courses.

During their final year of study, all students are required to complete a one-semester professional practice experience at one of the clinical facilities affiliated with the program.

Students enrolling in the program having completed an Associate of Applied Science (A.A.S.) degree in clinical or medical laboratory technology from an Illinois community college and having been certified as a medical laboratory technician may be awarded proficiency credit for some medical laboratory science courses through the A.A.S. to B.S. bridge option. If those students possess the appropriate general education and science prerequisites, then they may be able to complete the coursework needed to earn the B.S. degree fully online.

Program delivery

During their first three years in the program, students take courses on the Normal campus. Those courses are delivered primarily through face-to-face or blended face-to-face/online instruction. In the fourth year of the program, students complete a one-semester professional practice experience off campus and a semester of advanced coursework online.

The Department of Health Sciences offers a short-term study abroad course during the spring term. The course spans four to six weeks, with the travel portion taking place over spring vacation. Travel destinations may differ from one year to the next.

Department faculty (Fall 2018)

14 tenure track faculty members (4 Professors, 3 Associate Professors, and 7 Assistant Professors)

14 non-tenure track faculty members (3 full-time and 11 part-time, totaling 6.56 FTE)

Undergraduate student to faculty ratio: 19.0 to 1

Undergraduate student to tenure-line faculty ratio: 28.4 to 1

Core faculty for the B.S. in Medical Laboratory Science program includes four tenure-line faculty members.

Specialized accreditation

The B.S. in Medical Laboratory Science program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). The most recent accreditation review occurred in 2015-2016 and resulted in re-accreditation of the program for a 10-year period. The next comprehensive accreditation review is scheduled to occur in 2024-2025.

Changes in the academic discipline, field, societal need, and program demand

One of the greatest challenges in medical laboratory science training in recent years is related to greater reliance in the profession on molecular technology in performing diagnoses. Instructors must not only remain current with technological changes, but they also must find ways to teach students the technologies. Faculty members in the Medical Laboratory Science program at Illinois State often use videos and simulations to teach use of the technologies because they are too expensive to acquire for classroom use. Another impactful change is the trend toward hospital mergers and mergers of their microbiology departments and laboratories to save costs. In some urban areas a similar trend is occurring with respect to transfusion services (blood banks), such that a single, centrally-located laboratory may now be performing blood tests for multiple medical institutions. Such mergers have resulted in fewer potential professional practice sites available for students in the Medical Laboratory Science program. Consequently, faculty members have had to appeal to sites that are still in operation to take additional students. The U.S. Bureau of Labor Statistics predicts that annual demand for medical laboratory scientists to fill open positions in the field will continue to exceed the number of students graduating from two- or four-year medical laboratory science programs. The shortage of qualified applicants is likely to continue as laboratory professionals retire, training programs close, demand for healthcare increases as the population ages, and worker retention rates drop due to professional burnout.

Responses to previous program review recommendations

The 2010-2011 program review resulted in recommendations for faculty to ensure that both program tracks meet students' needs, continue efforts to recruit for student and faculty diversity, continue efforts to track certification examination pass rates, establish a plan for strengthening alumni relations, and continue efforts to establish additional clinical sites. At the time of the prior review, the program offered two tracks. Through one track, students fully completed the program as Illinois State University students, including a professional practice experience at a site affiliated with the program. Through a second (or alternative) track, students transferred to a hospital-based medical laboratory science program through which they completed their advanced coursework and professional practice experience. The Academic Planning Committee articulated concerns regarding the equivalency and quality of student experiences in the two tracks. In 2017 the Department of Health Sciences disestablished the alternative track due to persistent low enrollment. With regard to diversity, the program has been able to recruit students who self-identify with racial/ethnic groups traditionally underrepresented in the program and discipline and currently has a slightly higher percentage of such students than the university-wide percentage. The program has not been able to do the same regarding faculty diversity. It has been difficult attracting a diverse pool of applicants for faculty position openings when they have occurred, because there is shortage nationally of qualified educators to apply for the positions. With regard to examination pass rates, the program now pays an annual fee to the American Society for Clinical Pathology to obtain certification examination outcome records for program alumni and receives similar information from American Medical Technologists free of charge. The program director monitors both sources weekly. To help expand contacts with alumni, the program now collects post-graduation contact information as students are completing the program. The program uses the contact information to gather feedback regarding the program, notify alumni of job openings, and inform alumni of campus events in which they may want to participate.

To provide clinical experience choices for the growing number of students in the program, 11 additional clinical sites have affiliated with the program since the prior review. Seven are located in areas of the state most popular with students: central Illinois (four new sites) and the greater Chicago area (three new sites). The program has also asked several sites to consider offering both fall and spring professional practice placements rather than just one or the other.

Major findings

Since the prior program review, enrollment in the B.S. in Medical Laboratory Science program has been stable, and the program has maintained its reputation for graduating students who are prepared for the workforce. The program continues to be popular with students from central Illinois and the greater Chicago area. Because the demand for medical laboratory scientists is high and shortages of qualified personnel persist, the program could increase its enrollment to meet those needs. The program might expand its recruitment efforts in parts of the state particularly in need of medical laboratory personnel, such as western and southern Illinois. Hospitals providing professional practice experiences for students in the program continue to appreciate the program for its flexibility in allowing students to practice specialty areas in an order that works best for the affiliate and in allowing the affiliate to choose the semester during which the professional practice experience is offered. Affiliates also appreciate being able to recruit professional practice students to fill their vacancies. A challenge for the program has been improving pass rates on the Board of Certification examination taken by students as they graduate from the program. The accrediting body for the discipline, the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), has designated a 75 percent pass rate as its benchmark of program excellence. The program fell short of that benchmark in Fiscal 2015. In an effort to increase pass rates, the program now provides students free use of examination simulator software to practice for the examination. Faculty members monitor scores to guide students in their examination preparation.

Initiatives and plans

- Consider increasing efforts to recruit more students into the program, particularly students willing to work in areas of Illinois affected by medical laboratory personnel shortages.
- Continue efforts to raise certification examination pass rates by using examination simulation software, assessing effectiveness of the software, and exploring other ways to prepare students for certification examinations.
- Continue efforts to incorporate new technologies into the curriculum when practical and to seek simulations, videos, and other learning tools when acquiring and maintaining new technologies is too costly for the program.

PROGRAM REVIEW OUTCOME AND RECOMMENDATIONS FROM THE ACADEMIC PLANNING COMMITTEE

Review Outcome. The Academic Planning Committee, as a result of this review process, finds the B.S. in Medical Laboratory Science program to be in Good Standing.

The Academic Planning Committee thanks faculty and staff of the B.S. in Medical Laboratory Science program for a self-study report that evidences a collaborative effort involving all program faculty as well as contributions by students, alumni, and advisory committee members. The report sets forth a complete and critical analysis of the program. The committee congratulates faculty and staff for re-accreditation of the program by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) in 2016 for 10 years.

The committee commends faculty for offering a program designed to accommodate the varying circumstances and preferences of students interested in the field. Since the prior program review, the program has added 11 professional practice sites, including sites in the Chicago metropolitan area, to provide students more choices in planning their professional practice experiences and careers. Faculty members teach all senior-level courses online, so students completing their professional practice experiences at a distance from campus do not have to return to campus to complete their final coursework. Faculty has also introduced a track for students who hold an Associate in Applied Science degree in clinical laboratory technology from an Illinois community college and certification as a medical laboratory technician. Students enrolling in that track can complete the program online within two years. To

focus program resources on these efforts, faculty eliminated the seldom-used option for students to complete their study through a hospital-based medical laboratory science school.

Careful attention to program design and delivery has contributed to rising enrollments and increasing diversity of the student population. In fall 2009, when the prior self-study report was compiled, 96 students were enrolled in the program. Enrollment reached a 10-year high of 121 students in fall 2018. The percentage of students self-identifying with traditionally underrepresented racial/ethnic minorities increased from 25.0 in fall 2009 to 37.2 percent in fall 2018.

The committee commends faculty and staff members for their commitment to student learning and career success after students have enrolled in the program. The program maintains low student-to-faculty ratios in laboratory sections so faculty members are able to provide individualized attention to students. Faculty members engage students in research through course projects and independent studies and encourage students to report their findings at the annual University Research Symposium or through publications. Participation in the university Honors program by Medical Laboratory Science students has increased from 1 percent in fall 2010 to 7.4 percent in fall 2018. The committee recognizes faculty members for their efforts to encourage Honors program participation and to mentor students completing Honors projects. The committee commends efforts by faculty to encourage students in the program to learn from each other and to embrace their diversity. Those efforts have included changing student assignments to laboratory groups throughout the academic year so every student has the opportunity to work and learn with every other student in their cohort and arranging guest speakers to facilitate discussions regarding inclusiveness.

The program also offers students numerous co-curricular opportunities to learn more about health sciences fields and to engage with the campus and local community. Many of the opportunities are facilitated by the Medical Laboratory Science Society, the registered student organization affiliated with the program. Activities include fundraising for St. Jude Research Hospital, participation in the American Cancer Society Relay for Life, and co-sponsorship of the annual campus blood drive. For students seeking to learn about health sciences fields in other countries, the Department of Health Sciences has created a study abroad program open to students enrolled in any of its programs, including the B.S. in Medical Laboratory Science.

The commitment by faculty and staff to student learning and success has resulted in commendable student outcomes. The three-year average graduation rate for students accepted into a junior-senior cohort was 94 percent from Fiscal 2015 through Fiscal 2017. During that same period the average Board of Certification examination pass rate was 75 percent, and the average job placement rate was 99 percent. The committee recognizes efforts by faculty since the prior program review to provide additional assistance to students preparing for the certification examination. The program now subscribes to software that students use to practice for the certification examination. Faculty uses practice test results to guide each student in focusing on their most challenging content areas when studying for the examination.

The committee also recognizes the program for helping students complete the program in less time, thus reducing the cost to the students and qualifying them to take the certification examination sooner. For first-time-in-college students, average credits earned at graduation have declined from 151.8 credit hours in Fiscal 2010 to 126.1 credit hours in Fiscal 2018. The percentage of first-time-in-college students who complete the program within four years increased from 16.7 percent in Fiscal 2010 to 50.0 percent in Fiscal 2016, 77.8 percent in Fiscal 2017, and 90.0 percent in 2018. The average number of credits earned at graduation by students who transferred into Illinois State from another institution is consistently below the average across all undergraduate programs at the University.

A key resource to help faculty maintain the quality of the Medical Laboratory Science program and continue student success is the student learning outcomes assessment plan faculty has adopted to guide program improvements. The committee recognizes the program for an assessment plan that exceeds standards of its accrediting body by setting forth a multiple-measures approach that includes assessment of learning at multiple points in the curriculum.

Recommendations. The Academic Planning Committee makes the following recommendations to be addressed within the next regularly scheduled review cycle. In the next program review self-study report, tentatively due October 1, 2026, the committee asks the program to describe actions taken and results achieved for each recommendation.

Continue efforts to monitor and promote student success. The committee encourages faculty of the B.S. in Medical Laboratory Science program to continue its vigilance in maintaining program quality in support of student learning and success. The committee encourages continued faculty attention to student achievement with respect to learning outcomes and to program outcomes such as graduation and job placement rates. The committee notes mention in the self-study report of concerns regarding availability of equipment and technology to adequately support student learning. The committee recommends periodic evaluation of equipment and technologies used by faculty, including the practice examination software, for their effectiveness. The committee further recommends investigating whether other programs at the University have equipment that could be shared with the Medical Laboratory Science program or if other units might be willing to cost-share in equipment or technology purchases. Faculty might also seek equipment donations or financial contributions from the private sector.

Maintain professional practice agreements. Professional practice sites with staff members who are welcoming to students and dedicated to their learning are critical to maintaining the quality of the Medical Laboratory Science program and student success. The committee, while recognizing the time commitment involved, encourages faculty to monitor the quality of professional practice experiences at existing practice sites while seeking new sites to provide additional options for students or to accommodate program growth. The committee recognizes that faculty will be challenged by the national trend toward consolidation of health care facilities and medical laboratories. The committee encourages faculty to investigate establishing professional practice arrangements in other metropolitan areas of Illinois, such as the St. Louis Metro East region, or in states adjacent to Illinois.

Explore the potential for enrollment growth. The committee concurs with the faculty initiative articulated in the self-study report to explore opportunities to grow program enrollment. The committee recommends careful evaluation by faculty of current enrollment targets and plans in light of the projected demand for medical laboratory science instruction, the status of comparator and aspirational programs, and resources that would be needed to enroll more students while maintaining program quality, including faculty, staff, facilities, and professional practice sites. The committee recommends that faculty members work collaboratively with the Department of Health Sciences, the College of Applied Science and Technology, and the Office of Enrollment Management and Academic Services at the University in exploring this matter and determining a course of action.

Explore expanding the visibility and reach of the A.A.S. to B.S. bridge program. As faculty studies the potential for enrollment growth, the committee recommends that faculty particularly explore the potential for expanding the track designed for students transferring into the program with an Associate in Applied Science degree and medical laboratory technician certification. The committee suggests that faculty consider establishing the track as a sequence to aid in promoting the opportunity to prospective students and in monitoring progress of students enrolled in it. Faculty might explore the possibility of monitoring student work at professional practice sites electronically, if permitted by the program accreditor, as a way of expanding the reach of the program beyond Illinois to serve students in other states interested in seeking professional certification. As it considers the future of the bridge program, faculty may benefit by dialoguing with faculty of similar programs at the University, such as the RN to B.S.N. sequence in the Mennonite College of Nursing, the RHIT to HIM sequence in the Department of Health Sciences, or the new Dietetics Internship Graduate Certificate in the Department of Family and Consumer Sciences.

Increase faculty scholarship. The committee observes that from Fiscal 2010 through Fiscal 2017, Medical Laboratory Science faculty collectively reported fewer than three publications and fewer than two presentations per year. However, scholarly communication among Medical Laboratory Science faculty increased during that period to an eight-year high by Fiscal 2017. The committee views ongoing faculty scholarship as critical to informing instruction of students and exposing them to the latest theories and trends in the discipline and field. Accordingly, the committee encourages faculty to work toward achieving annual scholarly outputs at or near Fiscal 2017 levels. Faculty might seek ways to further involve students in their research, perhaps as undergraduate research assistants, or might seek advice and guidance from faculty of other undergraduate programs at the University that do so.

Work toward longer-term solutions to faculty diversity in the discipline. The committee supports efforts of the program to increase the diversity of its faculty to better reflect the increasingly diverse student population. The committee suggests a broad approach to diversity, to include different identities (including gender), research interests, higher education backgrounds, and perspectives. Given the infrequency of faculty position openings in the B.S. in Medical Laboratory Science program and the national shortage of applicants for such openings, increasing the diversity of faculty in the program is a difficult challenge. Until position openings occur, Medical Laboratory Science faculty can continue to seek professional practice sites that serve diverse populations and have diverse medical staff and to consider diversity when seeking guest presenters and student mentors. Faculty might also contribute to a longer-term initiative by encouraging its graduates who self-identify with traditionally underrepresented groups to consider graduate education and careers in teaching. Similar efforts are underway in some other academic units at the University. One resource that might assist alumni interested in pursuing a teaching career is the Diversifying Higher Education Faculty in Illinois scholarship program facilitated by the Illinois Board of Higher Education.

Continue collaborating with Milner Library to provide resources and information fluency instruction in support of the program. The committee recognizes collaborative efforts of Department of Health Sciences and Milner Library faculties to maintain access to research resources that support teaching and learning in the health sciences. The committee recognizes that those efforts include careful monitoring of costs associated with databases and academic journals. Those efforts will likely need to continue during the coming program review cycle. The committee also recognizes that collaborative efforts include helping students develop their information fluency skills. The committee encourages Medical Laboratory Science faculty and Milner Library faculty to expand those efforts by collaborating to identify information fluency goals and strategies for the B.S. in Medical Laboratory Science program, mapping strategies to the curriculum, providing opportunities for students to develop their information fluency skills at those points in the curriculum, and integrating assessment of student learning with respect to information fluency goals into the assessment plan for the program.

Continue implementing and refining the student learning outcomes assessment plan. The committee encourages faculty to continue its implementation of the student learning outcomes assessment plan for the program during the next program review cycle, to continue to utilize data collected through plan implementation to make program revisions as necessary, and to document how that has been done. The committee encourages faculty to periodically evaluate effectiveness of the plan in assessing student learning to identify any modifications to the plan faculty may deem necessary. One addition faculty might consider in the short term is incorporating a reference to the student surveys administered by the program to obtain student contact and job placement information and feedback regarding the program.