

CHEM474 (2)
Advanced Topics in Organic Chemistry
 Study of the principles of modern synthetic organic chemistry with applications from one or more of the following areas: natural product, medicinal, or polymer chemistry. Weekly: 2 lectures. Prerequisite: CHEM232. *Fall*

CHEM475 ◆ (2)
Advanced Topics in Physical Chemistry
 Advanced study of molecular spectroscopy, statistical thermodynamics, chemical dynamics, or the application of quantum mechanics. Prerequisites: CHEM432 or CHEM431 and permission of the instructor.

CHEM495 ◆ (1-4)
Independent Research
 An opportunity for chemistry and biochemistry majors to gain research experience by joining with a faculty member in study of an area of special interest.

Graduate

CHEM530 (2-4)
Topics in Teaching Chemistry
 Each time the course is offered, it treats one of the following areas:

- Concepts in Chemistry
 Fundamental ideas of chemistry
- Demonstrations
 Simple experiments which illustrate chemical principles
- Problem-Solving Strategies
 Exploration into the mental processes and logic behind problem-solving.

None of the above areas are to occur twice in one student's program. Prerequisite: CHEM232. Repeatable to 6 credits.

CHEM540 (2-4)
Topics in Chemistry
 Independent readings to be chosen in consultation with the instructor. A written report and an oral presentation covering the materials read are required. A minimum of 60 hours of work is required for each credit. Prerequisite: CHEM431. Repeatable to 6 credits.

CLINICAL & LABORATORY SCIENCES

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Faculty

Marcia A. Kilsby, *Chair, CLS Program Director*
 Albert W. McMullen
 Karen Reiner
 Richard D. Show, *Graduate Program Coordinator*

Academic Programs	Credits
BS in Clinical Laboratory Science (BSCLS)	124
BS: Allied Health Administration	65
MS in Clinical Laboratory Science (MSCLS)	32
Biomedical	
Business and Management	
Education	

Mission

The mission of the Department of Clinical & Laboratory Sciences, in harmony with Andrews University and the Seventh-day Adventist Church, is to prepare students for Christian service as clinical laboratory scientists. The CLS department encourages faculty in professional, educational and spiritual growth. The CLS faculty educates students to develop excellence in the skills necessary for a life work of service in quality health care and dedication to improving the human condition. CLS graduates will minister to the needs of others by practicing and promoting standards of excellence as clinical laboratory science professionals.

Clinical Laboratory Science (Medical Technology)

The degree program includes three years of undergraduate (pre-clinical) studies plus one year (3 semesters) of clinical (professional) education.

Pre-clinical Program. The first three years of undergraduate study include General Education, cognate science, and pre-clinical degree requirements. Program options feature directed elective course work selected in consultation with the faculty advisor according to the student's career goals and interests.

Clinical (Professional) Program. The year of clinical studies is comprised of lectures and student laboratories on the Berrien Springs campus and clinical practica at an affiliated hospital or clinical laboratory site.

Clinical Experience (Practica). Students work side-by-side with practicing professionals in patient health care during the final portion of the clinical year. Andrews University maintains a number of affiliations with clinical institutions across the

country. Student preferences for clinical site assignments are solicited and granted when possible. Final site assignments are made at the discretion of the faculty.

Clinical Year Admission Requirements. An independent admissions process is required for university students who wish to enter clinical studies. The application form may be obtained from the Department of Clinical and Laboratory Sciences office. Students should complete the application and return it to the departmental office by January 31 prior to their anticipated clinical-study year.

Admission requires an overall GPA of 2.50. In the admissions process, the GPAs for the cognate science courses and clinical laboratory science content courses are computed together. This combined GPA must also be a minimum of 2.50. Preference is given to students with the higher GPAs.

Applicants must be able to meet the program's published *Essential Functions*, copies of which are incorporated into the application packet, and express a willingness to comply with the principles, rules, regulations, and policies of both the university and the program as they relate to the ideals and values of the Seventh-day Adventist Church and the clinical laboratory science profession.

All prerequisite course work, including General Education, cognate science, and pre-clinical courses, must be completed prior to entry into the clinical year. A personal interview may be required at the discretion of the Admissions Committee.

In exceptional circumstances, the Admissions Committee may accept students outside the stated policy.

Student Progression in Clinical Year. The clinical year is highly structured and sequential. Enrolled students may not drop a class, audit a class, or earn a grade lower than C- in any class. Students may enter clinical practica only upon satisfactory completion of on-campus course work. Satisfactory completion is defined as a senior-year minimum cumulative GPA of 2.50 and the recommendation of the faculty. A student receiving a cumulative GPA of less than 2.50 may be allowed to advance if the program faculty identifies exceptional circumstances and recommends that the student continue in the program.

Student continuance in the clinical practica is conditional upon acceptable ethical deportment and exemplary patient-care practices. The hospital supervisors and program faculty are final arbiters in determining student continuance.

Professional Certification. Students who complete the degree program are eligible to write national certification examinations sponsored by the American Society for Clinical Pathology (ASCP) and the National Credentialing Agency for Laboratory Personnel (NCA).

Program Accreditation. The Andrews University Program for Clinical Laboratory Sciences holds accreditation from the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), 5600 N River Rd, Suite 720, Rosemont, IL 60018, (773) 714-8880 fax (773) 714-8886, email at info@naacls.org, or the Web at www.naacls.org.

Academic Calendar 2009–2010

2009

July 24	Fri	Senior summer term (clinicals) ends
July 27	Mon	Registry review week begins
Aug 1	Sat	Certification ceremony

2010

April 30	Fri	Senior spring semester (clinicals) ends
May 3	Mon	Senior summer semester (clinicals) begins
July 23	Fri	Senior summer term (clinicals) ends
July 26	Mon	Registry review week begins
July 31	Sat	Certification ceremony

Undergraduate Programs

BS in Clinical Laboratory Science (124) (BSCLS)

General Education requirements—32

(Adjustments for BSCLS)

Arts & Humanities—3

Language/Communication—9

Social Science—3

Mathematics—3

AU students—Statistics preferred. Students transferring into clinical program—any college-level course.

PE/Wellness—2

HLED120 plus one activity course. Must also pass a physician-administered physical exam before advancement to clinical practica

Physical/Natural Sciences: see cognate sciences below

Religion—12

(or one course per year of residence)

Service Fieldwork—fulfilled through 23 credits of clinical practicum.

Cognate Science Requirements—26

BIOL165: BIOL166 or 111; CHEM131, 132, 231, 232, 241, 242.

(Fulfills General Education Life/Physical Science requirement)

Major Requirements—61

Prerequisites—11

CLSC105, 110, 230, 250, 260

Major courses—50

CLSC320, 400, 401, 402, 411, 412, 413, 421, 423, 431, 432, 433, 441, 442, 443, 451, 452, 453, 460, 463, 493.

Directed electives—5–8

Students select courses in consultation with and by the consent of their advisors in a planned program to enhance professional preparation. Courses are chosen from biology, business, chemistry, computer science, electronics, and education. Pre-medical/pre-dental students must include PHYS141, 142 General Physics (8 credits).

BS: Allied Health Administration (65)

This degree is designed for health-care professionals seeking to enhance the knowledge they already have and to help them prepare for future career employment requirements. The degree format features a strong general education and administrative/business component and provides an academic foundation for health-care administrative positions. It is open only to individuals holding an associate degree or a two-year certificate in an allied-health professional area with earned certification where applicable in such areas as diagnostic ultrasound, nuclear medicine, physician assistant, radiation therapy, radiologic technology, respiratory therapy, and special procedures in radiologic technology. Admission to the program is by permission of the Department of Clinical & Laboratory Sciences chair.

Degree Requirements—124

Transfer credits accepted from an AS degree or certificate program—34

General Education Requirements—46

Complete Bachelor of Science General Education requirements.

Business/Administration Courses—27

ACCT 121, 122, BSAD341, 355, 384, ECON226, MKTG310 and management courses selected in consultation with and approval of the advisor.

ALHE480 Practicum in Administration—4

Graduate Programs

MS in Clinical Laboratory Science (32) (MSCLS)

The Department of Clinical & Laboratory Sciences offers a graduate program leading to the Master of Science in Clinical Laboratory Science. In response to the diversity of career skills required by the clinical laboratory scientist (medical technologist), the degree features a variety of program emphases, including concentrations in biomedical sciences, business and management, and education.

Admission requirements. In addition to the general requirements for admission to a graduate program listed in the graduate admission section of this bulletin, the following are departmental requirements:

- Applicants' previous course work must include 16 semester credits of biological sciences, 16 semester credits of chemistry, and one college-level course in mathematics. Deficiencies must be removed prior to admission to the graduate program.
- Applicants must have an overall GPA of at least 3.0 in undergraduate courses and at least 3.0 in the undergraduate cognate science (chemistry, biology, math and clinical laboratory science) courses.
- Applicants must hold United States professional certification and/or licensure in clinical laboratory science (medical technology) acceptable to the admissions committee. Certification may be either general or in one of the recognized areas of specialization. Acceptable certification is usually defined as that offered by the American Society for Clinical Pathology (ASCP) or the National Credentialing Agency for Laboratory Personnel (NCA).
- The required Graduate Record Examination (GRE) for admission is a minimum of 800 Composite (Verbal + Quantitative). Students who do not achieve 800 on their GRE may be accepted under provisional status.

Individuals lacking United States professional certification may request to be admitted on a provisional basis while they pursue the course work required for eligibility to write the national certification examinations. These clinical courses and their prerequisites require a minimum of four academic semesters. The courses include CLSC230, 250, 260, 320, 400, 401, 402, 411, 412, 413, 421, 423, 431, 432, 433, 441, 442, 443, 451, 452, 453, 460, 463, and 493. Students must receive United States professional certification before completing more than 9 graduate credits, and must meet the GPA requirements as stated above. Students may not enroll in CLSC561, CLSC562 or CLSC585 prior to obtaining certification.

Degree Requirements

In addition to meeting the general requirements for graduate degree programs, students must meet the following departmental requirements:

- Complete a minimum of 32 semester credits including the core of 20 semester credits and 12 semester credits selected from the emphasis chosen.
- Have the graduate program coordinator approve course selections and course sequencing. Students may substitute alternate courses listed in this Bulletin with the consent of the coordinator and the approval of the dean of the College of Arts and Sciences.
- No grade lower than C is acceptable in the graduate portion of the program.
- Maintain a minimum cumulative GPA of 3.00 for the graduate portion of the program.

Core courses—20

ACCT500; BSAD500; CLSC501, 502, 561, 562, 585; plus a minimum of 3 graduate religion credits selected in consultation with graduate program coordinator

A minimum of 12 semester credits from one of the following options:

Biomedical Emphasis*: BCHM421, 422, 430; BIOL444, 445, 446, 475, BOT450, 525, ZOOL425, 464, 465, 475

Business and Management Emphasis*: ACCT635 (if not taken as part of the core), BSAD515, 530, 531, 620

Education Emphasis*: EDAL520, 635, EDCI545, 547, 607, 610, 637, 650, EDFN500, 607, EDPC514, 520, 554

*A relevant course not listed in this emphasis may be selected in consultation with and approved by the CLS Graduate Program Coordinator.

Enrollment Continuation Requirements. A student whose cumulative graduate GPA falls below 3.00 in any given semester is placed on academic probation. Academic probation students are not allowed to register for or continue participation in CLSC585.

In consultation with the graduate program coordinator, the clinical laboratory science graduate faculty determines the student's proposed course load for the following semester. The faculty's recommendation is referred to the dean/graduate program coordinator of the College of Arts & Sciences for final approval.

A student who does not raise his/her graduate GPA to 3.00 within one full-time equivalent semester is terminated from the program. Exceptions require the approval of the clinical laboratory science graduate faculty and the dean/graduate program coordinator of the College of Arts & Sciences.

Courses

(Credits)

See inside front cover for symbol code.

ALHE440 (1-4)

Topics in _____

Repeatable in different areas. Prerequisite: permission of Program Director.

ALHE480 (4)

Practicum in _____

Prerequisite: permission of Program Director.

- CLSC105** (1) required. A pass/fail grade is assigned. Prerequisite: permission of Program Director.
Introduction to Clinical Laboratory Science
 Lectures and/or demonstrations presented by each of the departmental faculty members covering the major disciplines in clinical laboratory science. A field trip to visit a clinical laboratory is also included. Weekly: one lecture.
- CLSC110** (1)
Medical Terminology
 An in-depth study of medical terms and abbreviations relating to diseases, disorders, and drugs. (This course is also available to off-campus students through Distance Learning. Prerequisite: permission of instructor.)
- CLSC230** \$ (3)
Fundamentals of Clinical Microbiology
 Orientation to clinical microbiology; specimen selection, collection, and transport; microscopic evaluation; stains and sterilization techniques; media and incubation selections; identification of routine and non-routine microorganisms; susceptibility testing; automation and quality assurance. Weekly: Two lectures and two labs.
- CLSC250** \$ (3)
Fundamentals of Clinical Chemistry
 Clinical lab procedures, safety, application of statistical procedures in quality control, and principles of clinical laboratory instrumentation. Topics include carbohydrates, lipids, electrolytes, and hepatic function with selected pathologies. Weekly: Three lectures and one lab. Prerequisites: completed or currently enrolled in CHEM131 or permission of instructor.
- CLSC260** \$ (3)
Fundamentals of Human Blood Biology
 Introduces the production, maturation, function of normal blood cells and hemostasis; blood group antigen systems, antibody identification and compatibility testing. Selected routine manual hematology, hemostasis, and immunohematology procedures are performed. Weekly: Three lectures and one lab.
- CLSC320** (3)
Principles of Immunology
 Innate and acquired immune systems of the human organism; immunoglobulin production, structure, function, and diversity; antigen characteristics, variety, and specific red cell groups; tolerance and memory; complement structure and function; cell mediated immunity function and regulation; autoimmune disorders; transplantation and tumor immunology; immunodeficiency disorders; principles and procedures of techniques used in modern immunology lab. Weekly: Three lectures.
- CLSC400** (2)
Specimen Procurement and Processing
 Clinical specimen collection and processing; point-of-care testing, professional ethics; phlebotomy practicum. Prerequisite: permission of the instructor.
- CLSC401, 402** (0)
Clinical Year Seminar I, II
 Introduction to educational methodology, team building, multicultural communication, service outreach, professionalism, clinical laboratory sciences literature and research design and practice. Preparation and delivery of written and oral presentations on current topics. Attendance to all sessions is
- CLSC411** (3)
Hematology
 Cellular elements of the blood, their maturation, functions, and morphologies; abnormal and disease state hematology; principles and procedures of routine and special hematology assay methodologies; correlation of patient conditions with results of hematology assay results. Prerequisites: CLSC260 and permission of Program Director.
- CLSC412** (1)
Hemostasis
 Hemostasis systems, their function, interaction, and monitoring; correlation of hemostasis assay results with various disorders; thrombosis and anticoagulant therapy; principles and procedures of routine and special hemostasis assays. Prerequisites: CLSC411 and permission of Program Director.
- CLSC413** (4)
Clinical Hematology & Hemostasis Practicum
 Professional health-care laboratory practicum; emphasis in patient-care application of hematology and hemostasis procedures. Prerequisites: CLSC411, 412 and permission of Program Director.
- CLSC421** (2)
Clinical Immunology
 Antigen/antibody functions and interactions; detection and analyses. Basic immunologic mechanisms. Theory of immunologic and serologic procedures. Immunologic manifestations in infectious diseases. Quality control in immunology. Prerequisites: CLSC320 and permission of Program Director.
- CLSC423** (1)
Clinical Immunology Practicum
 Professional health-care laboratory practicum: emphasizes patient-care applications of immunologic and serologic procedures. Prerequisites: CLSC421 and permission of Program Director.
- CLSC431** (4)
Clinical Microbiology
 Simulated clinical practice for the separation of normal flora from pathogenic microorganisms encountered in various body sites; emphasis on identification of pathogens, solving case histories and unknowns; study of antimicrobial mode of action and testing. Specimen collection, culture and identification of mycobacteria. Prerequisites: CLSC230 and permission of Program Director.
- CLSC432** (2)
Special Microbiology
 Study of parasites, fungi and viruses involved in human infections. Emphasis on specimen collection and preservation, culture and identification procedures. Prerequisites: CLSC431 and permission of Program Director.
- CLSC433** (5)
Clinical Microbiology Practicum
 Professional health-care laboratory practicum; emphasis in patient-care applications of bacteriology, mycology, parasitology,

and virology. Prerequisites: CLSC431, CLSC432 and permission of Program Director.

CLSC441 (3)

Immunohematology

Blood grouping and typing; blood group antigen systems; compatibility testing; antibody identification; quality control and quality assurance; donor recruitment and selection; component preparation; blood-banking records; grouping and compatibility problem solving; patient clinical state correlations. Prerequisites: CLSC260, CLSC320 and permission of Program Director.

CLSC442 (1)

Transfusion Medicine

In-depth study of immunohematology testing results, clinical patient manifestations, blood component therapy and blood product requirements. Prerequisites: CLSC441 and permission of Program Director.

CLSC443 (4)

Clinical Immunohematology Practicum

Professional health-care laboratory practicum; emphasis in patient-care applications of immunohematology. Prerequisites: CLSC441, 442 and permission of Program Director.

CLSC451 (4)

Clinical Chemistry

Carbohydrate, lipid, enzyme, electrolyte, acid-base balance, trace element, protein systems, and gastric functions; correlation with normal physiology and selected pathological correlations. Analysis of relevant blood and body fluids constituents. Prerequisites: CLSC250 and permission of Program Director.

CLSC452 (2)

Clinical Chemistry and Body Fluids

Liver function, renal function, endocrinology, toxicology, and therapeutic drug monitoring. Analysis of various body fluids such as serous fluids, synovial fluid, amniotic fluid, and urine. Correlations with normal physiology and selected pathological conditions. Prerequisites: CLSC451 and permission of Program Director.

CLSC453 (5)

Clinical Chemistry Practicum

Professional health-care laboratory practicum. Emphasis on patient-care applications in clinical chemistry. Prerequisites: CLSC451, 452 and permission of Program Director.

CLSC460 (2)

Clinical Laboratory Systems

Survey of current Laboratory Information Systems (LIS) including database design and maintenance, test requesting, result entry, result reporting, quality control applications, and peripheral devices. Discussion in selected areas that include health-care delivery systems; problem solving in the clinical laboratory; human resource management; supply and equipment acquisition; financial management; performance standards and assessment; ethics; and regulatory processes. Prerequisite: permission of Program Director.

CLSC463 (1)

Clinical Microscopy Practicum

Professional health-care laboratory practicum. Emphasis in patient-care applications of body fluids. Prerequisites: CLSC452 and permission of Program Director.

CLSC490 (1-4)

Topics in _____

An in-depth study of selected topics in the clinical laboratory sciences. Repeatable in different specialized areas. Prerequisite: permission of Program Director.

CLSC493 (1)

Practicum Project

Designed to be an integral component of the clinical year practica experience. Introduces students to the principles, practices, and performance of clinical laboratory projects expected of practicing professional Clinical Laboratory Scientists.

CLSC495 (1-4)

Independent Project

Topics may be from areas relevant to clinical laboratory practice and must be approved by the Program Director. Repeatable in a different subject area. Independent readings earn S/U grades. Prerequisite: permission of Program Director.

CLSC496 (1)

Extended Clinical Practicum

A twelve-week professional health-care laboratory practicum. Emphasis in patient-care applications. Subject areas are to be coordinated with the Clinical Site Education Coordinator and the Program Director. Graded S/U. Prerequisites: successful completion of the twenty-week clinical practica of the Clinical-Year Program and permission of Program Director.

CLSC501, 502 (1)

Seminar in Clinical Laboratory Science

Introduction to educational theory, teaching methods and assessment. Cooperative research into topics of current interest in the literature. Each semester the student prepares a written and oral presentation based on current readings. Faculty and guest lectures also contribute to the seminar series. Admission by permission of Graduate Program Coordinator.

CLSC561 (3)

Laboratory Management Issues and Strategies

The health-care environment is rapidly changing, and will continue to change for the foreseeable future. In the clinical laboratory, ever-changing government regulations and reimbursement policies require a laboratory manager to be flexible and adopt new skills. Issues faced by the manager and styles and strategies used to deal with these issues are explored. Prerequisite: Permission of Graduate Program Coordinator.

CLSC562 (3)

Issues in Clinical Laboratory Regulations and Practice

Clinical laboratories are increasingly regulated by state, federal and other agencies. Applicable regulations will be examined and their impact on laboratory operations evaluated. A selected number of laboratory quality assurance procedures, as specified by CLIA '88 regulations, will be performed in the laboratory. Prerequisites: Statistics and permission of Graduate Program Coordinator.

CLSC585 (5)

Advanced Studies in Clinical Laboratory Science

Designed in consultation with and coordinated by the area specialty advisor. A proposal, cumulative report, presentation and defense required. Prerequisite: Certification and/or licensure as a clinical laboratory scientist and permission of Graduate

Program Coordinator. Clinical placement depends on clinical site availability.

CLSC595 (1-4)
Independent Study/Readings/Research Project

Topics may be from immunology, immunohematology, clinical chemistry, hematology, microbiology and other areas of patient-care science, clinical laboratory science education, management, or applications specially relevant to clinical laboratories. Repeatable in a different subject area for a total of four (4) credits. Independent readings earn S/U grades. Prerequisite: permission of Graduate Program Coordinator.

CLSC650 \$ (0)
Project Continuation

Student may register for this title while clearing deferred grade (DG) and/or incomplete (I) courses with advisor approval only. Registration for this title indicates full-time status.

CLSC655 \$ (0)
Program Continuation

Students may register for this non-credit continuation course to maintain active status. For additional information on active status, please refer to p. 51 in the bulletin. Registration does not indicate full-time status.

COMMUNICATION

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Faculty

Delyse E. Steyn, *Chair*
Beverly J. Matiko
Debbie Michel
Melchizedek M. Ponniah
Allen Steele
Charles H. Tidwell (joint appointment)

Emeritus

Luanne J. Bauer

Academic Programs	Credits
BA: Communication	38
International Communication Emphasis	59
Communication Management Emphasis	59
Media Technology Emphasis	59
BA: Journalism	38
Media Studies Emphasis	59
BA: Public Relations	38
International Public Relations Emphasis	59
BFA: Bachelor of Fine Arts	
Electronic Journalism	75-76
BS: Communication Arts	
Secondary Education Emphasis	36-38
Minor in Communication Studies	20
Minor in Journalism	20
Minor in Media Studies	20
Minor in Public Relations	20
MA: Communication	
Interdisciplinary Program	40-43
Emphasis Programs	40
Graduate Certificate Program	12

Mission

“Communicating for community” reflects the vision of the programs offered by the Department of Communication. The mission of the Andrews University Department of Communication is a Christ-centered, team-based, student-focused community that develops excellent communicators who meet the challenges of church and society.

Communication is all about connection—successfully sharing messages and meaning. Communication competence is critical to being an effective leader. Lee Iacocca, chairman and CEO of Chrysler Corporation, said, “the most important thing I learned in school was how to communicate...you can have brilliant ideas, but if you can't get them across, your brains won't get you anywhere.”

The Department of Communication offers a variety of undergraduate programs as well as a master's program.