CHEM474
**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
**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
**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
**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
**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.

**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
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, or the Web at www.naacls.org.

Academic Calendar 2009–2010

<table>
<thead>
<tr>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 24 Fri</td>
<td>April 30 Fri</td>
</tr>
<tr>
<td>Senior summer term (clinicals) ends</td>
<td>Senior spring semester (clinicals) ends</td>
</tr>
<tr>
<td>July 27 Mon</td>
<td>May 3 Mon</td>
</tr>
<tr>
<td>Registry review week begins</td>
<td>Senior summer semester (clinicals) begins</td>
</tr>
<tr>
<td>Aug 1 Sat</td>
<td>July 23 Fri</td>
</tr>
<tr>
<td>Certification ceremony</td>
<td>Senior summer term (clinicals) ends</td>
</tr>
<tr>
<td></td>
<td>July 26 Mon</td>
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<tr>
<td></td>
<td>Registry review week begins</td>
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<tr>
<td></td>
<td>July 31 Sat</td>
</tr>
<tr>
<td></td>
<td>Certification ceremony</td>
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</tbody>
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Undergraduate Programs

BS in Clinical Laboratory Science (124)

(Adjustments for BSCLS)

General Education requirements—32

Arts & Humanities—3
Language/Communication—9
Social Science—3
Mathematics—3
Statistics—1

(Fulfills General Education Life/Physical Science requirement)

Major Requirements—61

Prerequisites—11
CLSC105, 110, 230, 250, 260

Major courses—50

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, BSAD 341, 355, 384, ECON 226, MKTG 310 and management courses selected in consultation with and approval of the advisor.

ALHE480 Practicum in Administration—4

Graduate Programs

MS in Clinical Laboratory Science (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 CLSC 230, 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 CLSC 561, CLSC 562 or CLSC 585 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, EDUC545, 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. Students are not allowed to register for or continue participation in CLSC 585.

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
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.
Presentations on current topics. Attendance to all sessions is required. A pass/fail grade is assigned. Prerequisite: permission of Program Director.

**CLSC411 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 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 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 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 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 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 Special Microbiology**
Study of parasites, fungi and viruses involved in human infections. Emphasis on specimen collection and preservation, culture and identification procedures. Prerequisites: CLSC31 and permission of Program Director.

**CLSC433 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
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
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
Clinical Immunohematology Practicum
Professional health-care laboratory practicum; emphasis in patient-care applications of immunohematology. Prerequisites: CLSC441, 442 and permission of Program Director.

CLSC451
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
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
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
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
Clinical Microscopy Practicum
Professional health-care laboratory practicum. Emphasis in patient-care applications of body fluids. Prerequisites: CLSC452 and permission of Program Director.

CLSC490
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
Practicum Project
Designed to be an integral component of the clinical year practicum experience. Introduces students to the principles, practices, and performance of clinical laboratory projects expected of practicing professional Clinical Laboratory Scientists.

CLSC495
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
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
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
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
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
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

Nethery Hall, Room 209
269-471-6314; Fax 269-471-3125
commdept@andrews.edu
commgrad@andrews.edu
www.andrews.edu/comm/

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
  Emphasis Programs | 40
  Interdisciplinary Program | 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.