RESPIRATORY CARE  
C. William Habenicht, Coordinator  
(616) 471-6551  
Physical Therapy Building  
Andrews University offers prerequisite course work to prepare students who wish to enter a 2-year Associate of Science degree program or a 4-year Bachelor of Science degree program in Respiratory Care. Admission requirements vary among professional respiratory care programs. Not all professional programs accept transfer credits. Therefore, as soon as possible, interested students should contact the programs of choice for the most current prerequisite requirements. A list of accredited respiratory care programs may be obtained from the American Association for Respiratory Care, 11030 Ables Lane, Dallas, TX 75229 (phone 972-243-2272 and ask for the Education Department) or explore the web at http://www.aarc.org/patient_resources/schools.html

Loma Linda University: Interested students may complete the prerequisites for Loma Linda University’s Respiratory Care Education Program while attending Andrews University. Check with the above listed coordinator for the required course work. The Pre-LLU/RC student may then apply and transfer to LLU through its selective admissions process as a second-year student in their program.

ALLIED HEALTH

Halenz Hall, Room 326  
(616) 471-3336  
cls@andrews.edu  
http://www.andrews.edu/ALHE

Faculty  
Marcia A. Kilby, Chair, CLS Program Director  
Albert W. McMullen  
Richard D. Show, Graduate Program Coordinator  
Clifford Sutherland

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The Department of Allied Health prepares students who are committed to preserving and protecting the dignity of life and death. They promote values and attitudes consistent with the Seventh-day Adventist Christian lifestyle. They strive to instill in students a life-long personal quest for individual growth and fulfillment and for continual excellence in health-care practice.

Clinical Laboratory Science  
(Medical Technology)

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

Pre-clinical Program. The first 3 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 adviser 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 a clinical practicum at an affiliated hospital or clinical laboratory site.

Clinical Experience (Practicums). 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. Application forms may be obtained from the Department of Allied Health office. Students should complete these applications and return them to the departmental office by February 15th 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 be a minimum of 2.50. Should applications exceed class capacity, 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 practice 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 of Clinical Pathologists (ASCP) and the National Certification Agency of Medical 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), 8410 West Bryn Mawr Avenue, Suite 670, Chicago, IL 60631-3415, (773) 714-8080.

ACADEMIC CALENDAR 2000-2001

March 9 On-campus Didactic Studies end  
March 19 Clinical practicums begin  
May 11 Senior Spring semester (Clinicals) ends  
May 14 Senior Summer semester (Clinicals) begins  
July 27 Senior Summer semester (Clinicals) ends  
August 6 Beginning of Registry Review Week  
August 11 Certification ceremony
Undergraduate Programs

BS in Clinical Laboratory Science—127

General Education requirements—31
(Adjustments for BSCLS)
• Arts & Humanities—3
• Social Science—3
• Mathematics—3
• AU students—statistics. Students transferring into clinical program—any college-level course
• PE/Wellness—2
• HLED130. Must also pass a physician-administered physical exam before advancement to clinical practicums
• Physical/Natural Sciences: see cognate sciences below
• Religion—16
  (or one course per year of residence)
• Service Fieldwork—fulfilled through 24 credits of clinical practicums.

Cognate Science Requirements—29
• BIOL165: BIOL 166 or 111, and 3-4 credits of relevant BIOL, PHTH, or ZOOL courses; CHEM131, 132, 231, 232.

Major Requirements—61
• Prerequisites—11
  • CLSC101, 102, 230, 250, 260
  • Major courses—50
  • Directed electives—6
  Students select courses in consultation with and by the consent of their advisers 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 Allied Health chair.

Degree Requirements—124
• Transfer credits accepted from an AS degree or certificate program—34
• General Education Requirements—54
  Complete Bachelor of Science General Education requirements.
  • Business/Administration Courses—27
  • ACCT 121, 122, BSAD335, 341, 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

The Department of Allied Health 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, computer information science, and education.

Admission requirements. In addition to the minimum 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 hold professional certification acceptable to the Society of Clinical Pathologists or the National Certification Agency for Medical Laboratory Personnel sponsored by the American Society of Clinical Laboratory Science.
  • Individuals lacking professional certification may be granted provisional admission 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 4 academic semesters. The courses include CLSC320, 400, 401, 402, 411, 412, 413, 421, 423, 431, 432, 433, 441, 442, 443, 451, 452, 453, 460, 463, 490, 495.
  • Students must receive professional certification before completing 16 graduate credits.

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 or 635, BSAD500; CLSC501, 502, 561, 562, 585; plus a minimum of 3 graduate religion credits selected in consultation with and approval of the graduate program coordinator.

A minimum of 12 semester credits from one of the following options:
  • Biomedical Emphasis: BCHM421, 422, 430; BIOL419, 444, 445, 446, 447; PHTH417, 427, 447, 457; BOT525, ZOOL464, 475, 500
  • Business Emphasis: ACCT635 (if not taken as part of the core), BSAD436, 475, 515, 530, 531, 532, 535, 638, 670; MKTG500, 540, NRS517
  • Computer Information Science Emphasis: Courses selected in consultation with and approved by the 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 equivalent course load for the following semester. The faculty's recommendation is referred to the dean/graduate program coordinator of the College of Arts and Sciences for final approval.

A student who does not raise his/her graduate GPA to 3.00 within one full-time equivalent semester (12 credits) 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 and Sciences.

Courses

See inside front cover for symbol code.

ALHE440 Topics in (1-4)
  • Repeatable in different areas. Prerequisite: Permission of Program Director.

ALHE480 Practicum in (4)
  • Prerequisite: Permission of Program Director.

CLSC101 (was MTCCH105)
  • Medical Terminology and Introduction to Health Professions
An in-depth study of medical terminology and an introduction to the health professions offered on Andrews University campus. Weekly: One lecture.
CLSC102 (was MTCH106)
*Introduction to Clinical Laboratory Science*
Exercises from major clinical laboratory science disciplines are demonstrated or performed. Weekly: One three-hour lab.

CLSC230 (was MTCH235)
*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 (was MTCH255)
*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.

CLSC260 (merges MTCH215, 245)
*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 (was MTCH 345)
*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 (was MTCH400)
*Specimen Procurement and Processing*
Clinical specimen collection and processing; point of care testing, professional ethics; phlebotomy practicum. Prerequisite: Permission of the instructor.

CLSC401, 402 (was MTCH401, 402)
*Clinical Year Seminar I, II*
Introduction to educational methodology and clinical laboratory sciences literature. Preparation and delivery of written and oral presentations on current topics. Attendance to all sessions is required. A pass/fail grade is assigned. Prerequisites: Permission of Program Director.

CLSC411 (was MTCH411)
*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.

CLSC412 (was MTCH412)
*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.

CLSC413 (was MTCH413)
*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 (was MTCH421)
*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 (was MTCH423)
*Clinical Immunology Practicum*
Professional health-care laboratory practicum: emphasis patient-care applications of immunologic and serologic procedures. Prerequisites: CLSC421 and permission of Program Director.

CLSC431 (was MTCH431)
*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 (was MTCH432)
*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 (was MTCH433)
*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 (was MTCH441)
*Immunohematology*
Blood grouping and typing; blood group antigen systems; compatibility testing; antibody identification; quality control and quality assurance; donor recruitment; blood-banking records; grouping and compatibility problem solving; patient clinical state correlations. Prerequisite: CLSC260, CLSC320 and permission of the Program Director.

CLSC442 (was MTCH442)
*Transfusion Medicine*
In-depth study of immunohematology testing results, clinical patient manifestations, blood component therapy and blood product requirements. Prerequisite: CLSC441 and permission of Program Director.

CLSC443 (was MTCH443)
*Clinical Immunohematology Practicum*
Professional health-care laboratory practicum; emphasis on patient-care applications of immunohematology. Prerequisites: CLSC440, 442 and permission of Program Director.

CLSC451 (was MTCH451)
*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. Prerequisite: CLSC250 and permission of the Program Director.

CLSC452 (merges MTCH452, 461)
*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 (was MTCH454)
*Clinical Chemistry Practicum*
Professional health-care laboratory practicum. Emphasis on patient-care applications in clinical chemistry. Prerequisite: CLSC451, 452 and permission of Program Director.

CLSC460 (merges MTCH410, 490)
*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 organizational structures; problem solving in the clinical laboratory; development of personnel evaluation procedures; supply and equipment acquisition; budget preparation and analysis; ethics; and regulatory processes. Prerequisite: Permission of the Program Director.
Each of the BFA degree emphases has a 3-part curriculum: (1) Art History; (2) Visual Art Foundation; and (3) Advanced Visual Art. Additional cognates along with the General Education requirements complete the specifications for graduation for the BFA degrees.

**BFA 9-hour Complementary Area Requirement:**
BFA students must take courses beyond the introductory level in an area(s) which complement(s) their chosen media emphasis. For example, if the 27 hour emphasis is ceramics (3-dimensional), then the complementary area may be painting and/or printmaking (2-dimensional); and conversely, if the 27 hour emphasis is painting (2-D), then the complementary area may be sculpture and/or ceramics (3-D). The photography emphasis may allow 8 hours of graphic design (ART214 and 414) to be substituted to meet the complementary area requirement. The Graphic Design complementary area is shaped with the student’s advisor and may include such areas as computer graphics, photographic arts, marketing, and communication.

**BFA: Graphic Design Digital Media Emphasis (2-D)—89**
The digital art and design emphasis is recommended for those wishing to combine the study of art and design with the opportunity to explore more extensively computer graphics environments as a medium for visual communication and/or personal artistic expression.

The degree prepares students to enter one of the computer-based visual communication-oriented professions educated as an artist or designer/visual communicator, or to enter graduate studies in electronic visualization.

**Art History—9**
ARTH235, 236, 440
**Visual Art Foundation—22**
**Digital Media Foundation—8**
DGME175, 375.
**Advanced Graphic Design—27**
ART214, 310, 414 (16 hours), 495 Senior Exhibition and Slide Portfolio, 4 hours. Electives, 23 hours chosen in consultation with adviser from the following areas: DGME, ART, ARTH, PHTO, COMM, MKTG, JOUR.

**Photography Emphasis (2-D)—80**
Recommended for those preparing for professions that require people with well-developed perceptual skills who are comfortable working with complex equipment and changing technologies. Photography students are expected to develop a creative, experimental, and artistic approach to their work, regular and productive work habits, and eventually a personal focus that leads to a senior exhibition and portfolio. The BFA requires the following course work, including 9 hours of advanced work in a complementary 2-D or 3-D studio art medium (available in ceramics, painting, and printmaking).

**Art History/Theory—14**
ARTH235, 236, 420, 440 and electives from PHTO210, 300.
**Visual Art and Photography Foundation—25**
ART104, 107, 116, 117, 118, 207; PHTO115.
**Advanced Visual Art and Photography—41**
ART304, 495 Senior Exhibition and Slide Portfolio 1 hour, and complementary visual art courses up to 9 hours; 28 hours advanced PHTO courses in consultation with adviser.

**Cognate:** JOUR/375 Photojournalism.

**BFA: Visual Art**
The following three course groups are common to all BFA Visual Art and Pre-Art Therapy Emphases.

**Art History Foundation—14**
ARTH235, 236, 420, 440, plus one elective in art history (3 hours)

**Visual Art Foundation—25**
2-D courses: ART104, 116, 117, 207 and PHTO115;
3-D courses: ART107, 118.

**Advanced Visual Art—41**
ART304, 495 Senior Exhibition and Slide Portfolio, 1 hour; advanced work in one 2-D or 3-D emphasis (28 hours in one: ceramics, painting, or printmaking); complementary 2-D or 3-D emphasis (total of 9 hours).

**Ceramics Emphasis (3-D)—80**
Recommended for those pursuing studio pottery as a profession and who are comfortable working with ideas of aesthetic form, personal experimentation, technical production, and utilitarian purpose. Students work with a variety of traditional and state-of-the-art equipment and methods to gain a broad understanding of clay forming, glazing, and firing techniques necessary for the development of a personal focus. Early emphasis is placed on the mastery of ceramic craft and the development of regular and productive studio habits. Later, emphasis is placed on the development of a personal direction, senior exhibit and portfolio. For the BFA degree in ceramics, students register for 28 hours of ART307 and 9 hours of complementary 2-D course work.

**Painting Emphasis (2-D)—80**
Recommended primarily for those planning to enter graduate school. Emphasis is on developing perceptions of form and color, a strong sense of 2-D design, awareness of the visual world as subject matter for aesthetic and intellectual response, the work habits necessary to turn feelings and ideas into satisfying compositions, and an eventual personal focus for purposes of a senior exhibition and portfolio. For their advanced work, students register for 28 hours of ART305 and 9 hours of complementary 3-D course work.

**Pre-Art Therapy Emphasis—80**
Recommended for those planning to do graduate work in art therapy and to enter that profession. May require credits beyond the normal college load. In addition to fulfilling the BFA degree requirements, students should also take PSYC101, 251, 252, 454, 460.

**Printmaking Emphasis (2-D)—80**
Recommended for those planning for professions that require people who are comfortable working with ideas of aesthetic form, personal experimentation, technological production, and utilitarian purpose. Students work with traditional and contemporary graphics/printmaking processes that result in the production of multiple works which are personal, aesthetic, and/or functional in purpose. Emphasizes the student’s development of regular and productive studio work habits and a personal focus which leads to a senior exhibition and portfolio. For their advanced work, students register for 28 hours of ART306 Printmaking and 9 hours of complementary 3-D course work.

**BA: Art—40**

The BA: Art is a liberal arts degree that requires broad intellectual knowledge to material, spiritual, and emotional awareness. The degree requires 40 hours in visual-art and art-history courses, a minor in a non-art second area, and the General Education requirements including a foreign language. Each of the BA emphases listed below require the following art history courses:

**Art History Foundation—9**
ARTH220, 235, 236, 440.

**Art History Emphasis—40**
Recommended for those planning to do graduate work in the humanities or enter professions that require a broad overview of visual culture. Students study art history as a field of inquiry into the stylistic, sociological and symbolic intentions of chiefly public works of art from a variety of cultures. In addition to the 9 hours of art history foundation courses listed above, the following courses are also required:
ARTH420; Electives in Art History (17 hours) 6 hours chosen from ARTH328, 329, 450, and ART380; 6 hours chosen from ARCH315, 316, or 434; and 5 chosen from PHTO210, 300, or HORT350; 2-D Visual Art (3 hours); 3-D Visual Art (3 hours).

**Required cognate:** HIST400

**Pre-Art Therapy Emphasis—40**
Pre-art therapy students take the visual-arts foundation and advanced visual-art component from the visual-art emphasis listed below (40 hours) and 3 hours of ART 380 Topics is required—topics which relate to the study or practice of art therapy. A minor in Behavioral Sciences is required, including PSYC101, 251, 252, 454, 460.

**Visual Art Emphasis—40**
Recommended for those planning to enter careers that require skilled eye-hand coordination, sensitive workmanship, and well-developed conceptual and technical skills. In addition to the 9 hours of art history listed above, the following 31 hours of visual art (25 hours foundation and 6 hours advanced):

**Visual Art Foundation—25**
2-D Courses: ART104, 116, 117, 207; PHTO115.
3-D Courses: ART107, 118.
**Advanced Visual Art—6**
Selected in consultation with the adviser from advanced drawing, painting, printmaking, and ceramics courses.

**BS: Art Education—53**
This degree, offered in cooperation with the Department of Teaching, Learning, and Administration, prepares students to teach art on the elementary and secondary levels. Majors desiring teacher certification or who are planning to teach art must complete the requirements for denominational and/or state teacher certification through the School of Education. The BS in art education requirement includes the successful completion of a senior exhibition and a portfolio of the student’s work given to the Art Department.

**Art History—9**
ARTH235, 236, 440.
**Art Methods—3**
ART457, or ART459

**Visual Art Foundation—25**
ART104, 107, 116, 117, 118, 207; PHTO115.

**Advanced Visual Art Requirements—12**
In consultation with the adviser, do advanced