

**Medical Laboratory Sciences (Updated May, 2019)**  
**Dr. John T. Long, Advisor-Baptist Health College Little Rock**  
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Medical Laboratory Sciences is a profession which is practiced almost exclusively in hospitals or diagnostic clinics. Medical laboratory scientists perform laboratory tests on blood and body fluids to determine the presence or absence of disease, to monitor the response of treatment and to assist in health maintenance.

The Ellis College of Arts and Sciences, in cooperation with the Baptist Medical Center in Little Rock, offers a Bachelor of Science degree in medical laboratory science. Three years of the program are obtained on the Henderson campus. The fourth year is completed at the Baptist Health College in Little Rock or at an approved hospital-associated teaching laboratory.

Upon completion of the fourth year clinical program, the graduate is eligible to apply for the various certification examinations.

**Degree Requirements:**

1. Completion of a minimum of 90 semester hours described below with at least a 2.00 GPA is necessary for application to the clinical curriculum. In order to receive credit toward a degree from the university, the student must apply and be admitted to Henderson prior to enrolling in the clinical curriculum in medical laboratory science. In all cases, students will be required to complete nine months of residence at Henderson State University with a minimum of 30 hours of residence credit.
2. Acceptance into the clinical program in medical laboratory science at Baptist Health College LR.
3. Completion of the clinical curriculum with a minimum GPA of 2.00.

**On-Campus Curriculum**

**Hours**

A. General Education Component .....	38
B. Specific General Education and Other Required Courses:	
BIO 2114, 2094, 3544, and 4 hours Jr.-Sr. electives.....	16
CHM 1014, 1024, 2084, 3051, and 3063, and 3073, 3131 .....	20
Electives .....	16
Total Hours.....	90

Recommended Electives: Parasitology (BIO 3444), Biochemistry (CHM 4283), and Introduction to Computers (CSC 2003).

A minor is required for graduation from Henderson. A minor in biology is obtained by taking CHM2104 Botany. A minor in chemistry is obtained by taking the 19 hours of required courses listed above.

**Clinical Curriculum at Baptist Health College LR** **Hours**

Seminar I - Laboratory Fundamentals.....	1
Seminar II.....	2
Immunology.....	2
Management and Educational Topics.....	1
Body Fluids.....	1
Immunoematology.....	2
Clinical Microbiology.....	4
Clinical Chemistry.....	4
Hematology.....	4
Internship I.....	4
Internship II.....	4
Internship III.....	3
Internship IV.....	6
Total Hours.....	38

**Clinical Courses in Medical Laboratory Science**

**MTC 4001. Seminar I - Laboratory Fundamentals.** Introduction to the hospital laboratory including phlebotomy and medical terminology; attendance at laboratory in service.

**MTC 4312. Seminar II.** Attendance at laboratory inservice; presentation of inservice including visual aids; review for comprehensive exam.

**MTC 4102. Immunology.** Principles of basic immunoglobulin structure and antigen-antibody reactions with application to clinical immunology procedures.

**MTC 4401. Management and Educational Topics.** Introduction to basic principles of management and educational principles.

**MTC 4201. Body Fluids.** Chemical, physical and microscopic study of urine, cerebrospinal and other body fluids.

**MTC 4222. Immunoematology.** Genetic theory of human blood groups and fundamentals of transfusion practice and components therapy.

**MTC 4114. Clinical Microbiology.** Study of human pathogenic microorganisms including bacteria, mycobacteria, fungi and parasites, with emphasis on clinical isolation and identification techniques.

**MTC 4214. Clinical Chemistry.** Study of analyses in serum with emphasis on clinical significance, diagnostic utility, and detection methods, including immunoassay and toxicology.

**MTC 4304. Hematology.** Study of hematopoiesis, anemias, leukemias, hemoglobinopathies, coagulation, and principles of hematological testing.

**MTC 4504. Internship I.** Clinical training in the following areas of hospital laboratory: hematology and coagulation. Includes operation of instrumentation and quality control practices.

**MTC 4604. Internship II.** Clinical training in the following area of the hospital laboratory: Chemistry & Urinalysis. Includes operation of instrumentation and quality control practices.

**MTC 4703. Internship III.** Clinical training in the following area of the hospital laboratory: Blood Bank/Serology. Includes operation of instrumentation and quality control practices.

**MTC 4806. Internship IV.** Clinical training in the following area of the hospital laboratory: Microbiology. Includes operation of instrumentation and quality control practices.

## Nuclear Medicine Technology

### Dr. John T. Long, Advisor-Baptist Health College Little Rock

Judy Pile, Director, Henderson Adjunct Instructor; Daniel Guffey, Program Director, Henderson Adjunct Instructor

Nuclear medicine technologists use radioactive materials to image the function of different organs, analyze biologic specimens, and treat certain diseases. This requires a highly skilled professional whose responsibilities and skills range widely.

The Ellis College of Arts and Sciences, in cooperation with Baptist Health College in Little Rock, offers a Bachelor of Science degree in nuclear medicine technology. Three years of the program are completed on the Henderson campus. The fourth and final year are completed at Baptist Health College in Little Rock. Acceptance into the final year is by application to the program at Baptist.

In their final year while at Baptist students are required to follow the normal Henderson State University policies in applying for graduation. Upon completion of the final year of study at Baptist, graduates are eligible to apply for the various certification examinations.

### Degree Requirements:

1. Completion of a minimum of 81 semester hours described below with at least a 2.00 GPA is necessary for application to the clinical curriculum. In order to receive credit toward a degree from the university, the student must apply and be admitted to Henderson prior to enrolling in the clinical curriculum in nuclear medicine technology. In all cases, students will be required to complete a minimum of 30 hours of residence credit.
2. Acceptance into the clinical program in nuclear medicine technology at Baptist Health College Little Rock.
3. Completion of the clinical curriculum with a minimum GPA of 2.00.

### On-Campus Curriculum

### Hours

A. General Education Component .....	37
B. Specific General Education and Other Required Courses:	
BIO 2114, 2174, and 2184 .....	12
CHM 1014, 1024, 3051, and 3063 .....	12
PHY 2034 and 2044 .....	8
CSC 2003, PHI 3113 .....	6
Statistics (STA 2323 or PSY 2143) .....	3
Writing Intensive Elective (Cell Biology is recommended) .....	3
Total Hours.....	81
Recommended Electives: Biochemistry (CHM 4283).	

### Clinical Curriculum at Baptist Health College LR

### Hours

Medical Terminology .....	1
Instrumentation I .....	4
Diagnostic Nuclear Medicine I .....	4
Nuclear Physics/Radiochemistry .....	4
Medical Ethics and Law .....	1
Patient Care .....	2
Radiopharmacy/Radionuclide Therapy .....	4
Diagnostic Nuclear Medicine II .....	3
Instrumentation II .....	2
Computed Tomography (CT, PET/CT) .....	2
Diagnostic Medicine III .....	4
Diagnostic Medicine IV .....	3
Radiation Health Physics .....	3
Radiobiology .....	1
Senior Seminars.....	1
Total Hours.....	39

## **Professional Course Work in Nuclear Medicine Technology**

### **Nuclear Medicine Technology**

**Dr. John Long, Chair**

**NMT 4318 Clinical Practicum I.** An introduction to clinical imaging. Students will be evaluated during each assigned clinical rotation during the semester.

**NMT 432\_ Clinical Practicum II.** Intermediate techniques in clinical imaging, radiopharmaceutical preparation, computer techniques and radiation health physics. Students will be evaluated during each assigned clinical rotation during the semester.

**NMT 4294 Instrumentation I.** Principles of operation and quality control of non-imaging nuclear medicine radiation detection equipment to include a section on statistics as they apply to the practice of nuclear medicine technology. Correlation with the clinical experience included.

**NMT 4302 Instrumentation II.** Principles of operation and quality control of collimated imaging radiation detectors.

**NMT 4084 Diagnostic Nuclear Medicine I.** Comprehensive study of the theory and methodology of imaging the different systems in the body, including rationale and indications for the study, patient preparation, radiopharmaceuticals used, imaging techniques, computer processing applications and diagnostic interpretation. Each section will be correlated with clinical exams performed in the clinical setting.

**NMT 4093 Diagnostic Nuclear Medicine II.** Continuation of Diagnostic Nuclear Medicine I.

**NMT 4104 Diagnostic Nuclear Medicine III.** Continuation of Diagnostic Nuclear Medicine II.

**NMT 4113 Diagnostic Nuclear Medicine IV.** Comprehensive study of the theory and methodology of various in vitro procedures such as the Red Cell Mass, RISA Plasma Volume, Red Cell Survival Study and Splenic Sequestration Study. Includes monoclonal antibody imaging, somatostatin-receptor imaging and radiolabeled peptide imaging procedures, PET/CT as well as other oncological diagnostic imaging studies. Correlation with the clinical experience included.

**NMT 4404 Nuclear Physics Radiochemistry.** Fundamentals of basic atomic and nuclear physics, including the structure of the atom, modes of radioactive decay, mathematical calculations of radioactivity, passage of charged particles and high energy photons through matter, and the primary and secondary sites of radionuclide production.

**NMT 4703 Radiation Health Physics.** Principles involved in minimizing exposure to patient, personnel, self and environment are discussed. Included are techniques for measuring levels of radioactive contamination, procedures for decontamination and a general overview of both national and state government regulatory issues regarding exposure and radioactive material handling. Correlation with the clinical laboratory experience included.

**NMT 4411 Medical Terminology.** Introductory course in the basics of building, spelling, and pronouncing medical words designed as a self-directed course.

**NMT 4421 Medical Ethics & Law.** Medicolegal and ethical principles involved in the practice of Nuclear Medicine Technology. Topics covered include the code of ethics and the legal implications of negligence in the clinical nuclear medicine setting.

**NMT 4432 Patient Care.** This course on patient care is presented in individual sections, taught by professionals and specialists in the particular topic. The course covers the principles and techniques of patient care, including cardiopulmonary resuscitation (CPR) certification, patient transport, ECG monitoring, physical assessment, pharmacology, venipuncture and I.V. therapy. Emphasis is placed on skills that are used by the technologist in the clinical setting.

**NMT 4504 Radiopharmacy/Radionuclide Therapy.** Fundamental principles of radiopharmacology, including radiopharmaceutical preparation and quality control, biochemical and physiological properties of radiopharmaceuticals, methods of localization and alterations of distribution, and the therapeutic use of radionuclides in nuclear medicine. Correlation with the clinical laboratory experience included.

**NMT 4452 Computed Tomography.** Emphasis will be placed on the operation and quality control of both Single Photon Emission Tomography (SPECT), Positron Emission Tomography (PET), and Computerized Tomography (CT). Basic principles and concepts of the modern computer, with emphasis on the application of computers and data processing in the Nuclear Medicine Department. Correlation with the clinical experience included.

**NMT 4461 Radiobiology.** Biological effects of the exposure of living tissue to ionizing radiation, including chronic and acute effects, the relative sensitivity and resistance of organ systems, and cellular and systematic response of tissue to radiation.

**NMT 4601 Senior Seminar.** Topics covered include medical informatics, healthcare administration and health sciences research methods as they relate to the field of Nuclear Medicine Technology.