MASTER OF PHYSICIAN ASSISTANT STUDIES

The mission of the Department of Physician Assistant Studies is to prepare outstanding Physician Assistants to recognize and treat acute and chronic illness and promote health. The Department of Physician Assistant Studies makes lives better by improving the healthcare, health outcomes and well-being of patients and their families through education, practice, service and research.

The vision of the Department of Physician Assistant Studies is to be a recognized leader in health care education, scholarship, and service. This vision includes the education and training of competent and caring health care providers who will meet the needs of society, faculty, staff, and student service to the community and region; and scholarship that will impact, advance, and add to the knowledge of humanity and health.

Students who successfully complete the program receive a Master of Physician Assistant Studies (M.P.A.S.) degree. Graduates are eligible to sit for the Physician Assistant National Certifying Exam (PANCE) (http://www.nccpa.net/BecomingCertified) given by the National Commission for Certification of Physician Assistants. Passing the PANCE is required for licensure in all states.

The Master of Physician Assistant Studies program is accredited by the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA) (http://www.arc-pa.org), 12000 Findley Road, Suite 150, Johns Creek, GA, 30097; phone (770) 476-1224, fax (770) 476-1738.

Admissions Requirements

Applications for the M.P.A.S. program are accepted for each year starting in mid-April through September 1. **Two separate applications; (1) CASPA application and (2) the PAS Supplemental Application are required.** Both must be submitted through the Central Application Service for Physician Assistants (https://portal.caspaonline.org) (CASPA).

The CASPA application, the PAS Supplemental Application, official transcripts, two reference letters, and all other supporting documents must be submitted and your CASPA status must be listed as completed by October 1.

Prior-year applicants must submit a new application. Questions about re-application should be directed to the School of Health Professions' Office of Admissions and Special Programs (http://uthscsa.edu/shp/welcome.asp) and/or CASPA.

Applicant open houses are typically offered during the spring semester. Applicants are encouraged to seek advisement from their college counselors or the Health Professions' Office of Admissions and Special Programs (http://www.uthscsa.edu/academics/health-professions?utm_source=uthscsaedushp&utm_medium=pageredirect&utm_campaign=shp) at (866) 802-6288 (toll-free) or (210) 567-6220.

Admission requirements for the Master of Physician Assistant Studies program include:

- Bachelor’s degree from a regionally accredited college or university
- Completion of the CASPA application
- Completion of the Supplemental application
- Payment of the non-refundable Supplemental application fee
- Minimum overall GPA of 3.0 on a 4.0 scale
- Minimum science GPA of 3.0 on a 4.0 scale
- A grade of C or better in prerequisite coursework
- Completion of all prerequisite coursework by the application deadline of September 1 (Note: no prerequisites can be in progress after the deadline date):
  - Biology I and II with labs, 8 semester credit hours
  - Human Anatomy with lab, 4 semester credit hours **
  - Human Physiology, 3 semester credit hours **
  - ** NOTE - If a combined Human Anatomy & Physiology course is taken, applicants must complete both Anatomy & Physiology I and Anatomy & Physiology II with the appropriate laboratories. Neither Anatomy & Physiology I or II, alone, satisfies the Anatomy and Physiology requirements.
  - Organic Chemistry I with lab, 4 semester credit hours
  - Organic Chemistry II with lab, 4 semester credit hours
  - Biochemistry, 3 semester credit hours
  - Microbiology, 3 semester credit hours
  - Genetics, 3 semester credit hours
  - Statistics-any discipline-specific course is acceptable, 3 semester credit hours
  - Psychology (general, introductory, abnormal or developmental), 3 semester credit hours
  - Subtraction of the Graduate Record Examination (GRE) (http://www.ets.org/gre) official scores. There is no minimum score requirement.
  - Community service hours
  - 500 hours of direct, hands-on patient care experience
  - 100 hours of Physician Assistant shadowing
  - Two reference letters - sent directly to CASPA
  - Any additional materials required from CASPA
  - Submission of official transcripts from each individual college/university currently or previously attended - must be mailed directly to CASPA only (Do not send transcripts to the Health Science Center)
  - Applicants who are enrolled in college courses at the time of application should submit an official transcript showing courses in progress. An updated transcript must be submitted upon completion of the courses. Note: Transfer credits indicated on another school’s transcript are not accepted in lieu of submitting the original institution record for that coursework.
  - International applicants only:
    - Submit Test of English as a Foreign Language (TOEFL) (http://www.ets.org/toefl) scores; minimum scores 560 (paper) or 68 (Internet).
    - Transcripts from institutions outside the United States must be submitted in the original language and must be accompanied by a NACES Members evaluation (http://www.naces.org) agency English translation for each course.

Admission and enrollment practices that favor specified individuals or groups:

As part of the Health Science Center PA program’s holistic process, all applicants are categorized based on multiple performance and experience based data points; these include overall GPA, science GPA, hours of community service, hours of health care experience, hours of PA shadowing, history of military service, and affiliation with a
medically underserved region. While none of these items, individually or in combination, guarantee selection, they have the capacity to augment the applicant’s overall submission.

**For the 2018-19 Application Cycle**

Physician assistant shadowing, hands-on patient care experience, and community service hours will not be required for a complete application, alternatively they will be highly recommended and application enhancing.

**Degree Requirements**

The Master of Physician Assistant Studies (M.P.A.S.) program is an intense didactic and clinical program that consists of 126 semester credit hours. The curriculum is designed to prepare physician assistants who will meet the needs of the people of South Texas. The program begins in the summer semester and runs continuously for 30 months. The didactic component of the curriculum consists of classroom, laboratory, and clinical preparation. Didactic instruction is designed to prepare the student to successfully complete clinical rotations, and ultimately, for practice as a physician assistant.

The M.P.A.S. program is based on traditional semesters. The final months of the program include supervised clinical practice (clinical rotations) and occur in sites throughout Texas. **All students must complete a minimum of two rotations in rural or medically underserved locations. Students must be prepared to assume the expense for these rotations.**

Rotations are full-time clinical experiences (minimum of 40+ hours per week). During the last few months of the program, the students will have an opportunity to participate in an area of concentration of their choice. A pass-fail summative evaluation is administered during the final four months of the program. Students must pass the summative examination to qualify for graduation.

**Grading and Advancement**

Grading standards, symbols, grade point scales, GPA determinations, and other considerations regarding the quality of work of students are the prerogative of the faculty of the program, as are issues of promotion and advancement.

The standing of students in their work is expressed by the following grades:

- **A** = Excellent
- **B** = Above Average
- **C** = Average
- **F** = Failure
- **P** = Pass
- **I** = Incomplete
- **IP** = In progress

All coursework in the PA Studies Program that receives a letter grade must be passed with either a grade of “C” or better. In courses that are Pass/Fail, the student must receive a “P”.

If a PA curriculum course is offered by another department and that department allows a grade of “D”, the PAS Department views that grade as not meeting the “C” requirement. A grade of “D” will be treated in the same manner as a grade of “F”.

To advance each semester, **unconditionally**, students must meet all of the following:

1. pass all courses with a minimum grade of "C" or "P"
2. maintain an **overall (cumulative)** GPA of **2.75** or greater
3. have faculty approval for advancement based on:
   a. academic performance
   b. demeanor
   c. attitude
   d. effort

To advance **unconditionally** to the Supervised Clinical Practice year, a student must also be BLS and ACLS certified.

**Graduation Requirements**

Masters degrees are awarded by the Board of Regents following the student’s completion of the prescribed course of study, the recommendation of the faculty, and the certification by the Dean of the School of Health Professions and the President of the Health Science Center that the candidate has fulfilled all requirements for the degree and certificate. Graduation from the Department of Physician Assistant Studies’ professional entry level graduate physician assistant program requires students to have an overall GPA of 2.75/4.0 scale.

Degrees are conferred only on official dates publicly announced. The Master of Physician Assistant Studies (M.P.A.S.) will be conferred upon those students who have successfully completed all program requirements (including successful completion of the summative evaluation).

It is the responsibility of the student to apply for graduation online using the student portal in the semester prior to anticipated graduation or at registration for the final year. Notices are sent from the Office of the University Registrar.

As in any educational setting, the student has the primary responsibility for acquiring knowledge. In offering courses of study, the Health Science Center and Department of Physician Assistant Studies in no way guarantees that any student accepted for enrollment will achieve any given level of academic or professional accomplishment. This includes certification and licensure.

A student must complete all requirements in effect at the time of their enrollment, provided there has been no break in that enrollment. Policies are reviewed annually and updated. Students are responsible for reading and abiding by new policies upon publication. The Program Director and the Dean of the School must approve any changes in a degree plan.

Students who complete training after the expected class graduation date may be required to provide justification to the Texas Medical Board prior to licensure. License to practice as a physician assistant in the state of Texas is solely at the discretion of the Texas Medical Board.
Sample Plan of Study

First Year
Summer
PHAS 5006 Clinical Applications in Physiology for the Health Professional 4
PHAS 5007 Pathogenesis of Human Disease 3
PHAS 5011 Principles of Ethics and Professionalism 1
PHAS 5044 Clinical Anatomy for Physician Assistants 5

Fall
PHAS 5001 Patient Evaluation 3
PHAS 5009 Principles of Nutrition for the Physician Assistant 2.5
PHAS 5036 Clinical Medicine for PA 2 5
PHAS 6010 Pharmacology 1 3
PHAS 6013 Scientific Inquiry 3
MLSC 5040 Laboratory Medicine 3

Spring
PHAS 5003 Behavioral Medicine 3
PHAS 5037 Clinical Medicine for PA 3 10
PHAS 6004 Preventative Medicine-Community Health 3
PHAS 6014 Pharmacology 2 3

Second Year
Summer
PHAS 5000 Physician Assistant Policy and Practice 2
PHAS 5004 Clinical Applications 4
PHAS 5035 Clinical Medicine for PA 1 3
PHAS 5038 Clinical Medicine for PA 4 2
PHAS 6015 Clinical Skills 2
EMSP 6135 Advanced Cardiac Life Support 1

Fall
PHAS 6101 Supervised Clinical Practice 1 4
PHAS 6102 Supervised Clinical Practice 2 4
PHAS 6103 Supervised Clinical Practice 3 4
PHAS 6104 Supervised Clinical Practice 4 4

Spring
PHAS 6105 Supervised Clinical Practice 5 4
PHAS 6106 Supervised Clinical Practice 6 4
PHAS 6107 Supervised Clinical Practice 7 4
PHAS 6108 Supervised Clinical Practice 8 4

Third Year
Summer
PHAS 6109 Supervised Clinical Practice 9 4
PHAS 6110 Supervised Clinical Practice 10 4
PHAS 6111 Supervised Clinical Practice 11 4

Fall
PHAS 6112 Supervised Clinical Practice 12 4
PHAS 6113 Supervised Clinical Practice 13 4
PHAS 6114 Supervised Clinical Practice 14 4
PHAS 6115 Supervised Clinical Practice 15 4

Total Credit Hours: 125.5

Objectives/Program Outcomes

Mission
The Mission of the Department of Physician Assistant Studies at the University of Texas Health Science Center, San Antonio is to prepare outstanding physician assistants to recognize and treat acute and chronic illness and promote health. The Department of Physician Assistant Studies makes lives better by improving the health care, health outcomes and the well being of patients and their families through education, practice, service and research.

Vision
By 2020, the Department of Physician Assistant Studies at the University of Texas Health Science Center San Antonio, will be recognized as a world class Physician Assistant program and be amongst the best programs in the United States. We will lead the nation in Physician Assistant education, scholarship and service.

Goals
- Attract a highly qualified and diverse student body: We focus on educating a diverse student body to become excellent health care providers. The table (http://www.uthscsa.edu/academics/health-professions/learn-about-our-educational-objectives-and-goals), which reflects the varied and wide-ranging backgrounds and experiences of our students, demonstrates our continued commitment to diversity.
- Sustain a high first time Physician Assistant National Certification Exam pass rate: Over the past three years, our students’ Physician Assistant National Certifying Examination (PANCE) pass rate has been 100 percent for first-time exam takers. Over the past five years, our first time pass rate has exceeded the National average.
- Cultivate graduates who are competitively marketable as health care providers: Over the past five years, 92.4 percent of our graduates were licensed to practice within six months of graduation. In addition, 100 percent of these licensed providers are currently practicing medicine.

For more detailed information about the mission, vision and goals for Physician Assistant Studies, please click here (http://www.uthscsa.edu/academics/health-professions/learn-about-our-educational-objectives-and-goals).

Program Policies and Information

Auditing Courses
Students may be required to audit previously attempted courses as a requirement of remediation. Course instructors, academic or clinical coordinators, department committees, or the department chair set standards of performance.

Computer Requirement
Students are required to purchase a laptop computer from the Health Science Center Computer Store (http://ims.uthscsa.edu/computer_networking/computer_store.aspx) upon matriculation. The cost of the purchase is calculated as a cost of attendance and is included in determination of financial aid eligibility.
Credit for Experimental Learning
All courses in the physician assistant curriculum must be completed. No course credit is given for experiential learning. There is no advanced placement.

Program Costs
In addition to required tuition and fees, there are costs for textbooks, scrubs, and equipment. The full-time clinical fieldwork experiences included in the curriculum may require that students relocate outside of San Antonio for the duration of the rotations. Fieldwork expenses will vary according to individual arrangements depending on the cost of travel, temporary housing, maintenance of local accommodations, etc. Students are encouraged to budget for major expenditures that could be associated with these assignments. Detailed information about program costs can be found on the Department of Physician Assistant Studies website.

CLSC Courses
CLSC 3000. Introduction to Clinical Laboratory Sciences. 2 Credit Hours.
This Web-based course is an overview of the clinical laboratory profession. There are three general areas of study. The first is information on the profession including history, educational requirements, job responsibilities and opportunities, as well as the structure and role of the clinical laboratory in medicine. The second is an introduction to medical terminology using an overview of the body systems. Examples of the use of laboratory tests to detect pathologies in these systems are included. The third area is quality assurance. Enrollment is open to laboratory science students at other universities both in state and out of state. Texas residents and non-residents living in Texas pay applicable tuition and fees of the Health Science Center.

CLSC 3001. Phlebotomy Practicum. 0.5 Credit Hours.
Under the direction and supervision of a clinical instructor in a hospital or outpatient facility, the student will be given the opportunity to gain experience and expertise in phlebotomy procedures. This practicum may be taken anytime after the student has been accepted into the program. Positions will be based on the availability of sites. Students must arrange this practicum with the education coordinator before enrolling. This practicum must be completed before beginning clinical practicums in the senior year.

CLSC 3020. Special Topics in Clinical Immunology. 1-2 Credit Hours.
This course is designed for students who have completed a course that included clinical immunology/serology at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected immunology/serology topics that may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. Prerequisites: proficiency exam, permission from course director.

CLSC 3022. Special Topics in Body Fluids. 1-2 Credit Hours.
This course is designed for students who have completed a course that included urinalysis and other body fluids at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected body fluids topics that may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. A proficiency exam and permission from course director are required.

CLSC 3035. Special Topics in Medical Microbiology. 1-5 Credit Hours.
This course is designed for students who have completed a medical microbiology course at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected medical microbiology topics that may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. Proficiency exam and permission from course director are required.

CLSC 3053. Special Topics in Immunohematology. 1-4 Credit Hours.
This course is designed for students who have completed an immunohematology course at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected immunohematology topics which may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. A proficiency exam and permission from course director are required.

CLSC 3063. Special Topics in Immunohematology. 1-4 Credit Hours.
This course is designed for students who have completed an immunohematology course at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected immunohematology topics which may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. A proficiency exam and permission from course director are required.

CLSC 3070. Diagnostic Immunology Lecture. 1.5 Credit Hour.
This didactic course presents the principles and applications of immunology as it pertains to diagnosis of disease states. The course will cover methods to detect infectious as well as autoimmune diseases using immunologic technologies such as immunofluorescence, enzyme immunoassays, and flow cytometry. Correlation of the laboratory results with the disease states will be emphasized. Clinical applications of flow cytometry, histocompatibility testing, serology, and immunochemistry assays will be presented. Immunology is required.

CLSC 3072. Molecular and Immunological Diagnosis. 4 Credit Hours.
This didactic course presents the principles of molecular biology and an in-depth review of immunology. Molecular and immunological techniques such as PCR, western blotting, flow cytometry, and immunochemistry assays will be discussed with an emphasis on the diagnosis of disease states. Clinical applications in forensics, paternity testing, diagnosis of infectious disease states, inherited conditions and neoplasms will be presented.

CLSC 3073. Molecular and Immunologic Diagnostic Lab. 1 Credit Hour.
This laboratory course will offer the opportunity for students to perform both molecular and immunologic techniques. Students will perform molecular diagnostic techniques such as PCR and gel electrophoresis that are used in the investigation of inherited conditions and neoplasms and become familiar with potential sources of error. Students will also perform immunologic procedures commonly used in the diagnosis of infectious and autoimmune diseases. Principles and applications of quality control procedures are practiced. Corequisites: CLSC 3072.

CLSC 3083. Special Topics in Clinical Chemistry. 1-4 Credit Hours.
This course is designed for students who have completed a clinical chemistry course at an accredited CLT/MLT program. The course provides the student the opportunity to gain an understanding of selected clinical chemistry topics that may include theory and/or practice. The topics vary according to student’s previous experience and education. Credit hours are variable. Hours will be assigned based on the topics covered. A proficiency exam and permission from course director are required.

CLSC 4020. Issues in Health Care. 1-3.5 Credit Hours.
This course is a study of selected topics in health care. Consent of instructor is required.
CLSC 4035. Introduction to Molecular Diagnostics. 1.5 Credit Hour. This course is a study of recombinant DNA concepts and technology. Applications of this technology in diagnosis and therapy of disease is emphasized. The course is a combination of lecture and laboratory. Prerequisites include genetics and junior CLSC coursework. One section of this course is in a distance-learning format offered via the Web. Students wanting to enroll in the Web section must receive permission from the instructor.

CLSC 4038. Microbiology Categorical Practicum. 10 Credit Hours. Under the direction and supervision of a clinical instructor in the clinical microbiology lab, the student is introduced to the functional roles of the clinical microbiology laboratory. Students will have the opportunity to develop proficiency in the areas of bacteriology, parasitology, mycology, mycobacteriology, immunology, and virology. A period of time will be devoted to allow the student to gain experience in performing microbiological studies in each of these areas.

CLSC 4040. Human Genetics. 2 Credit Hours. An advanced course which provides the student an opportunity to study the cell cycle, oogenesis, spermatogenesis, Mendelian inheritance, polygenic inheritance, population genetics, medical genetics, clinical cytogenetics, and basic molecular techniques. The course is self-paced requiring approximately 2 hours per week. Prerequisites: Admission to Cytogenetics Program or consent of instructor.

CLSC 4041. Clinical Cytogenetics. 4 Credit Hours. This is an advanced lecture course covering theories, concepts, and techniques applicable to the practice of clinical cytogenetics. Topics include mitotic and meiotic cell cycles with emphasis on errors and manipulations, chromosome structure, mechanisms of chromosome abnormality formation, cytogenetics syndromes, inheritance patterns, cancer genetics, instability syndromes, clinical correlation of chromosome abnormalities, microscopy, computer imaging, cell culture, analysis, ISCN, pedigree construction, and other current genetic issues. Prerequisites: CLSC 4040 or consent of instructor.

CLSC 4042. Hematology for the Geneticist. 1 Credit Hour. This is an advanced study of the normal production, maturation and function of erythrocytes, leukocytes and platelets. The pathogenic mechanisms as well as the peripheral blood and bone marrow findings in relation to leukocyte disorders will be covered. Study of the correlation of cytogenetic abnormalities to specific disorders will be emphasized. Corequisite: CLSC 4041 or consent of the instructor.

CLSC 4043. Cytogenetics Techniques. 4 Credit Hours. This is an advanced laboratory course designed to cover all aspects of cytogenetic laboratory practice including specimen evaluation, culture initiation, culture maintenance, harvesting, slidemaking, staining and banding techniques (conventional, GTG, QFQ, CBG, AgNOR, DA/DAPI, SCE, and FISH), banding pattern recognition, microscopic analysis, computer imaging, computer-assisted karyotyping and ISCN. Instrumentation, solution preparation, laboratory math, quality control, and regulatory issues will be emphasized. Prerequisites: CLSC 4041 or consent of the instructor.

CLSC 4044. Current Topics in Genetics. 1 Credit Hour. This is an advanced seminar course that provides the student an opportunity to acquire knowledge of the latest developments in the field of human genetics with emphasis on the structure, behavior, and function of chromosomes as related to human diseases. Discussion sessions follow seminar presentation of critical literature reviews of a specific topic, current journal articles, or of individual research. Presenters will be drawn from the cytogenetics community of the Health Science Center and surrounding area. Each student is required to make a short presentation on a topic of interest selected with the aid of the coordinator. Prerequisites: CLSC 4041 or concurrent enrollment.

CLSC 4045. Clinical Cytogenetics Laboratory 1. 5 Credit Hours. Under the supervision and direction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to extend their knowledge of principles and techniques of clinical cytogenetics which were presented in the didactic portion of the curriculum. The student will have the opportunity to gain experience with a wide variety of procedures which include culturing, harvesting, slide preparation, staining, and analyzing metaphases, with emphasis on the processing of peripheral blood samples. Clinical correlations of the chromosomal findings are included. Grades are based on laboratory performance and results achieved on written and/or practical examinations conducted at the particular clinical affiliate to which the student is assigned. Prerequisites: CLSC 4041, CLSC 4043, and CLSC 4042.

CLSC 4046. Clinical Cytogenetics Laboratory 2. 5 Credit Hours. Under the supervision and direction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to extend their knowledge of principles and techniques of clinical cytogenetics which were presented in the didactic portion of the curriculum. The student will have the opportunity to gain experience with a wide variety of procedures which include culturing, harvesting, slide preparation, staining, and analyzing metaphases, with emphasis on the processing of amniotic fluid and chorionic villi samples. Clinical correlations of the chromosomal findings are included. Grades are based on laboratory performance and results achieved on written and/or practical examinations conducted at the particular clinical affiliate to which the student is assigned. Prerequisites: CLSC 4045.

CLSC 4047. Clinical Cytogenetics Laboratory 3. 5 Credit Hours. Under the supervision and direction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to extend their knowledge of principles and techniques of clinical cytogenetics that were presented in the didactic portion of the curriculum. The student will have the opportunity to gain experience with a wide variety of procedures which include culturing, harvesting, slide preparation, staining, and analyzing metaphases, with emphasis on the processing of bone marrow and solid tumor samples. Clinical correlations of the chromosomal findings are included. Grades are based on laboratory performance and results achieved on written and/or practical examinations conducted at the particular clinical affiliate to which the student is assigned. Prerequisites: CLSC 4046.
**CLSC 4048. Clinical Cytogenetics Laboratory. 4. 5 Credit Hours.**
Under the supervision and direction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to extend their knowledge of principles and techniques of clinical cytogenetics that were presented in the didactic portion of the curriculum. The student will have the opportunity to gain experience with a wide variety of procedures which include culturing, harvesting, slide preparation, staining, and analyzing metaphases, with emphasis on quality control, applications of FISH, molecular techniques and computer imaging. Clinical correlations of the chromosomal findings are included. Grades are based on laboratory performance and results achieved on written and/or practical examinations conducted at the particular clinical affiliate to which the student is assigned. Prerequisites: CLSC 4047.

**CLSC 4049. Cytogenetics Lab Practices. 1.5 Credit Hour.**
An exploration of problem-solving processes and strategies for resolving difficult cases is the focus of this course. Students will be presented with the opportunity to integrate previously presented topics with experiences gained from clinical practicums. A thorough review of basic principles as applied in the clinical laboratory is included. Prerequisites: CLSC 4048 or consent of instructor.

**CLSC 4050. Research In Cytogenetics. 1-5 Credit Hours.**
This is an advanced course that provides the student an opportunity to apply scientific method to a clinical laboratory research problem, demonstrate a systematic application of hypothesis formation, and decision-making through research design principles. Course evaluation is based upon performance on the term project. Requires consent of Program Director and Instructor. May be repeated for credit. Prerequisites: CLSC 4047.

**CLSC 4058. Hematology Categorical Practicum. 6 Credit Hours.**
Under the direction and supervision of a clinical instructor, the student will have the opportunity to gain expertise working in the clinical hematology laboratory. Students will perform routine and special hematologic procedures, "troubleshoot" automated cell counters, and gain proficiency in morphologic evaluation of normal and abnormal cellular morphology, including peripheral blood and bone marrow examination. The student will be introduced to the technology of flow cytometry and immunologic study of disease states. In addition, the student will perform routine and special coagulation procedures and evaluate body fluids. Internal and external quality control methods in the hematology/coagulation laboratory will be emphasized. Phlebotomy techniques also will be practiced.

**CLSC 4068. Immunohematology Categorical Practicum. 6 Credit Hours.**
Under the supervision and direction of a clinical laboratory instructor, the student will have the opportunity to gain expertise in the various facets of clinical immunohematology. Areas emphasized include donor collection and processing, component preparation, routine grouping and typing, and compatibility testing. Students will have the opportunity to perform serologic testing for transfusion-transmitted disease. In addition, they will solve complex antibody problems and typing discrepancies utilizing specialized techniques such as enzyme treatment, elution, and autoabsorption. Students will be required to perform HLA typing and investigate suspected cases of hemolytic disease of the newborn and transfusion reactions. Quality control procedures and records management for each area will be emphasized.

**CLSC 4070. Immunology Practicum. 2 Credit Hours.**
The student will be introduced to the technology of flow cytometry and the immunologic study of disease states. In the immunology/serology laboratory, the student will be required to perform routine testing of antigen/antibody reactions to help in the diagnosis of certain disease states.

**CLSC 4088. Clinical Chemistry Categorical Practicum. 6 Credit Hours.**
Under the supervision and direction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to gain expertise and confidence working with automated clinical analyzers and performing esoteric clinical chemistry analyses. The student will have the opportunity to operate state-of-the-art, high-volume chemical analyzers, to observe preventive maintenance and troubleshooting procedures, and to gain firsthand experience with the recording and evaluation of quality control results. The student will perform highly specialized chemical analyses that may include serum protein electrophoresis, lipoprotein electrophoresis, toxicology screens, immunochromatographic assays, lecithin/sphingomyelin ratio for assessment of fetal lung maturity, blood gas analyses, and blood gas instrument troubleshooting procedures. The ability to organize work in a multi-tasking environment will be emphasized. The student will be encouraged to present interesting and unusual case studies in an academic environment.

**CLSC 4090. Management for Clinical Laboratory Sciences. 3 Credit Hours.**
This course is designed to provide the student with the opportunity to develop entry-level management and supervisory skills. Topics include principles of communication; group dynamics; leadership styles; interviewing; planning; financial analysis; and policies, procedures, and regulations. Developing and designing presentations; learning principles, objectives and use of audiovisual aids; and design and evaluation of research projects are discussed. Other timely topics in health care may be considered. This is a Web-based course and enrollment is open to clinical laboratory technicians or military-trained personnel who have been accepted into the CLS program, or by special permission from the course director.

**CLSC 5007. Toxicology Practicum. 5 Credit Hours.**
This is a one-semester rotation through different types of toxicology laboratories including medical examiners, clinical, and drug testing. Practicums will be supervised by faculty.

**CLSC 5014. Principles and Applications in Analytical Toxicology. 5 Credit Hours.**
This course will concentrate on major topical areas of toxicology including: mechanisms toxicity in teratogenicity and carcinogenicity; mechanisms of systemic toxicity and damage to specific organs, chemical and immunochemical analytical techniques including non-instrumental methods such as spot tests and thin layer chromatography, and instrumental methods such as ELISA, HPLC, LC/MS/MS, GC/MS and capillary zone electrophoresis; and toxicology of toxins and toxicants including herbs and botanicals. Case studies will be used through the course to develop skills in the application concepts and principles. Prerequisites: CLSC 5018.

**CLSC 5017. Toxicology Seminar. 1 Credit Hour.**
This course includes formal exchange of scientific information and ideas through presentations from recent scientific literature and from faculty and student research.
CLSC 5018. Medical and Forensic Toxicology. 5 Credit Hours.
This course concentrates on medical and forensic toxicology and
where the two branches meet. The course will concentrate on specific
topics within toxicology including toxins from plant and animal sources,
selected therapeutic drugs and drugs of abuse, the emerging use of
pharmacogenomics in personalized medicine and its role in reducing
toxicity, new paradigms relating to the development of toxic reactions
and provide introductory lectures in industrial and occupational
toxicology. Case studies will be used throughout the course to develop
problem-solving skills in the determination of cause, manner and
mechanism of death in postmortem cases. Requirements for toxicology
laboratory certification and design will be included.

CLSC 5020. Applied Toxicology. 2 Credit Hours.
This course is designed to complement courses CLSC 5014 and CSLC
5018. Under supervision of the program director and toxicologists from
various areas of the discipline, the student will apply her/his knowledge
of toxicology and forensic science to solving cases in emergency and
forensic cases. Permission is required.

CLSC 5041. Laboratory Medicine Lab. 1 Credit Hour.
This course is offered to students in the Physician Assistant Studies
Program. This is a laboratory course that provides the student with
hands-on experience in performing common physician office laboratory
procedures. Case studies are used to help students interpret and use
laboratory test results.

CLSC 5090. Independent Study In Clinical Laboratory Studies. 1-4 Credit
Hours.
This course allows for in-depth study in a specific topic area. Topics and
method of study are agreed upon by instructor and student. The course
may be repeated for credit when topics vary.

CLSC 6096. Capstone Project In Toxicology. 4 Credit Hours.
This is a focused well-referenced research project on current issues in
any area of toxicology, including but not limited to Clinical (emergency
toxicology and therapeutic drug monitoring) and postmortem forensic
toxicology. The project shall focus on the theory, analysis and current
practices and issues and may involve some laboratory work. The written
document shall be between 10,000-15,000 words long and shall be
accompanied by an oral presentation.

CLSC 6097. Research. 3 Credit Hours.
This course consists of supervised research under direction of faculty.

CLSC 6098. Thesis. 3 Credit Hours.
Instruction in the preparation of a thesis from the results of the research
performed in CLSC 6097. Registration is required for at least one term for
the MS candidate enrolled in CLSC 6097. Admission to candidacy for the
Master of Science degree is required.

CSBL Courses

CSBL 3005. Advanced Anatomy. Credit Hours.
Selected students will participate in lectures, detailed dissections,
presentations, and teaching of Pre-Matriculation students in the gross
anatomy laboratory. A special project or readings in the surgical anatomy
literature will be assigned. This elective is considered to be a full-time
commitment (40 hours per week). Students are expected to 1) attend
all lectures given in the Pre-Matriculation program, 2) to teach in all
scheduled laboratory sessions, 3) to prepare and present prosections,
4) to help prepare a laboratory examination, 5) to write and present a
literature review on an original topic of interest to the student related to
the region of the body being studied.

CSBL 4000. Special Topic. 4 Credit Hours.
This is a self-designed course created by both the student and the
department to cover a specific topic. A Course Approval Form must be
completed along with documentation of the designed course description.

CSBL 4001. Anatomy of the Newborn. 4 Credit Hours.
Detailed gross dissection and study of newborn specimen with special
emphasis on developmental origins as well as features and relationships
differing from the adult; combined with library study of developmental
malformations. Course fees: Lab fee $30.

CSBL 4002. Regional Anatomy. 4 Credit Hours.
Anatomy associated with one of the usual medical or surgical specialties,
such as gastroenterology, neurology, orthopedics, obstetrics and
gynecology, etc. Activities include detailed dissection, presentation of
 dissected material, assigned readings, and individual project. Course
fees: Lab fee $30.

CSBL 4004. Selected Research Project. 4 Credit Hours.
Individual research projects to be arranged between the student and
faculty members with whom he/she wishes to work.

CSBL 4005. Advanced Anatomy. 4 Credit Hours.
Selected students are required to participate in lectures, detailed
dissections, presentations of prosected material, and teaching in the
first year medical gross anatomy laboratory. Special projects, activities,
and assigned readings in the surgical anatomy and history of anatomy
literature. Course fees: Lab fee $30.

CSBL 4017. Advanced Neuroanatomy. 4 Credit Hours.
Selected students will be assigned a special project and readings in the
neuro anatomical literature. Course Fees: Lab fee $30.

CSBL 4024. History of Anatomy In Situ: Reawakening & Development of
Anatomy in the 14th - 18th Century Italy. 4 Credit Hours.
An in-depth study of the awakening and development of anatomy in
14th - 18th century Italy, visiting the sites where this occurred in Padua,
Bologna, and Florence. The course consists of one week of didactic
lectures and discussion prior to two weeks in Italy visiting anatomical
museums and two of the oldest universities in the world, and ending
with a week of student presentations based on a paper focusing on a
historical, social, or scientific issue arising during this period in the Italian
medical schools and currently relevant to the students' chosen field of
medicine.

CSBL 4025. Anatomy Mentored Teaching. 4 Credit Hours.
The Mentored Teaching Elective allows 3rd and 4th year medical
students to serve as teaching assistants for the spring CSBL 5022 Inter-
professional Human Gross Anatomy course. CSBL 5022 serves students
in the occupational therapy, physical therapy, physician assistant
and biomedical engineering programs, and students in the Masters of
Anatomy graduate program. Teaching assistants will serve as instructors
for laboratory dissections which cover the central and peripheral nervous
systems, vertebral column and back, the upper and lower limbs, head
and neck, body wall, thorax, abdomen, pelvis, and perineum. Other
 teaching assistant duties include preparation of prosection specimens
for teaching and demonstration, lab practical exam setup and grading,
and preparation and presentation of a brief topical review relevant to
anatomy. Applicants should have attained a minimum grade of B in
Language of Medicine and in Musculoskeletal/Dermatology and exhibit
the highest standards of professionalism. Enrollment is by permission of
the Undergraduate Medical Education Office and by the course directors.
CSBL 5007. Methods In Cell Biology. 1 Credit Hour.
Through a combination of lectures and demonstrations, the instructors will introduce students to techniques which are currently being used in cellular biology laboratories. The emphasis will be on the applications themselves, their uses, limitations, and the necessary controls. The following topic areas will be covered: imaging and microscopy, immunological techniques, bioinformatics (DNA and protein), rodent anatomy and histology, cytogenetics, and in vitro cell growth and transfection.

CSBL 5012. Physician Assistant Gross Anatomy. 5 Credit Hours.
This course will cover the basic principles of human anatomy. Lectures are correlated with laboratory sessions in which students will learn human gross anatomy of the adult through the study of cadaver prosections, bones, models, atlas drawings and radiographs. Emphasis will be placed on basic systems anatomy as they apply to the physician's assistant. Course Fees: Gross Anatomy fee $30.00.

CSBL 5013. Gross Anatomy. 6 Credit Hours.
This course will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, head and neck, body wall, torso, abdomen, pelvis, and perineum, and the upper and lower limbs. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. These dissections will be supplemented by the study of prosected specimens, models skeletons, and other demonstration materials. Course fees: Lab fee $30 Human Materials fee $865.

CSBL 5015. History Of Anatomy. 2.5 Credit Hours.
The history of anatomy course is designed to acquaint medical, dental, and graduate students with the history of medicine and especially with the physicians and scientists who made essential discoveries in human anatomy. Using a biographical approach, the course is presented as a seminar with lectures, assigned readings and student presentations.

CSBL 5016. Dental Gross Anatomy. 6 Credit Hours.
The focus of this course is the structure of the human body, with emphasis on the functional anatomy of the trunk, neck, head, and nervous system. Regional dissection of a human cadaver, by groups of students, is supplemented by individual study of prosections, models, skeletons, and other demonstration materials and is guided by lectures, conferences, and films. The first part of the course, which deals with the anatomy of the thorax and abdomen, presents a general overview of the functional architecture of most major body systems. The emphasis is on principles of structure, to allow development of a holistic understanding of human biology, both normal and pathological. The latter half of the course is devoted to study of the head and neck; greater emphasis will be placed on anatomical relationships with obvious reference to clinical dentistry. Course Fees: Human materials fee: $865 Lab fee: $30.

CSBL 5019. Gross Human Anatomy For Graduate Students. 6 Credit Hours.
This course will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, head and neck, body wall, torso, abdomen, pelvis, and perineum, and the upper and lower limbs. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. These dissections will be supplemented by the study of prosected specimens, models skeletons, and other demonstration materials. Permission of course director if required to enroll. Course fees: Human materials fee $ 865 Lab fee $30.

CSBL 5020. Dental Neuroscience. 1.5 Credit Hour.
This course will present the student with the basics of neuroanatomy underlying somatosensory perception, special senses, orofacial reflexes, and common neurological disorders. The emphasis will be on neuroanatomical pathways relevant to the head and neck, especially those mediated by the trigeminal system. The course also will include consideration of motor pathways and the special senses, disorders of which will necessarily influence treatment plans developed by future dental practitioners. Acquisition of a basic understanding of the neuroanatomical pathways discussed in lectures will be reinforced by laboratory sessions with representative images of brain and spinal cord sections.

CSBL 5022. Inter-professional Human Gross Anatomy. 5.5 Credit Hours.
This courses will teach structural and functional anatomy of the normal human body. Lectures will serve as introductory information for the laboratory dissections to follow and to clarify the interactions of the various anatomical components to accomplish the function of the body. The course will cover the central and peripheral nervous systems, vertebral column and back, the upper and lower limbs, head and neck, body wall, torso, abdomen, pelvis, and perineum. Special emphasis will be placed on the laboratory experience in which the learner will perform a detailed dissection of the entire human body in order to achieve an understanding of the three-dimensional relationships and thus the interactive function of the body. The dissections will allow the student to understand the anatomical basis for disease and dysfunction in organ systems and their applications to clinical practice. They will be supplemented by the study of prosected specimens where possible, models skeletons, and other demonstration materials.

CSBL 5023. Development. 1 Credit Hour.
The course provides a survey of concepts in developmental biology (induction, cell-cell interactions, morphogen gradients, morphogenetic movements, transcription regulation, organogenesis) using experimental examples from both invertebrate and vertebrate embryos. The first set of lectures will focus on gametogenesis, fertilization, and early developmental events, such as cleavage, midblastula transition, gastrulation, and axis formation. The second set of lectures will explore the fates of germ layers in the contexts of cell type-specific differentiation and cell-cell interactions during organogenesis.
CSBL 5024. Genomics. 1 Credit Hour.
This course covers historical aspects of the Genomic project and high throughput methods (microarray, SAGE, proteomics, etc.) to perform global analysis of gene expression; the course also provides an overview of new biological fields such as systems biology, functional genomics, and comparative genomics. The students will have the opportunity to become familiarized with tools, methods, databases, and approaches used to extract biological information from global analyses. Hands-on training on biological databases and classes covering examples of the use of genomics to answer questions related to cancer and diseases is an important part of the course, helping the students to visualize how genomics can be used in their own research projects.

CSBL 5025. Genetics. 1 Credit Hour.
This course is designed to provide an overview of genetic research. Topics to be covered include: cytogenetics, mitochondrial genetics, cancer genetics, linkage analysis, complex traits, population genetics, animal models, sex determination, and epigenetics.

CSBL 5026. Stem Cell Biology. 1 Credit Hour.
This course is an up-to-date overview on current topics in stem cell biology. It is intended for the (future) basic scientist who is interested in studying the regulatory mechanisms of stem cells as well as for the (future) clinician who is interested in how stem cell biology will continue to impact patient care. Topics that will be discussed are: (1) basic biology and stem cells, including embryonic stem cells, adult stem cells, stem cells in different tissues and model systems; (2) microenvironment-mediated; (3) epigenetic regulators of stem cells; (4) stem cells in medicine, including regenerative medicine, cancer and aging; and (5) ethics.

CSBL 5030. Basic Histology. 1 Credit Hour.
This course is designed to provide students in the Anatomical Sciences track of the M.S. degree program an introduction to microscopic cell structures and relevant functions followed by study of the four basic human tissues (epithelial, connective, muscle and nervous tissues). In addition, a few specialized tissues (blood cells, bone, cartilage and lymphoid tissues) will be examined in depth to develop skill in understanding function in relation to viewing microscopic anatomical features. Overall, this course is meant to provide a foundation for the understanding of the microscopic architecture of the organ systems of the body and the role these play in normal activity and disease processes. Lectures, independent study (self-directed learning), and laboratory experiences will be used in teaching the fundamentals of human histology.

CSBL 5032. Dental Histology. 5 Credit Hours.
Through lectures, demonstrations, and laboratory work, students in this course will be given the opportunity to study the microscopic structure of the basic tissues and organs of the human body, followed by details of the embryologic development and microscopic structure of the various organs of the oral cavity. Current concepts in cellular biology are presented during the portion of the course in which they are most relevant. The general purpose of this course is to give students the opportunity to become acquainted with the basic embroyology, cytology, and histology of normal human tissues and organs, thereby providing a foundation of knowledge for the understanding of normal activity and disease processes. Course Fees: Included in general lab fee. $48 microscope fee for the Freshman year includes this course.

CSBL 5033. Brain Health Journal Club. 1 Credit Hour.
A journal club with an emphasis on brain health. The scope of the journal club is broad, with topics ranging from molecular mechanisms to the impact of injuries on behavior. Brain injuries ranging from stroke, spinal cord injury and traumatic brain injury (TBI) to age-associated neurodegeneration will be emphasized. Scientific articles on relevant or state-of-the-art techniques will also be encouraged. On a rotating basis, participants will be expected to present to the group either a paper of interest and relevance to their work or an update on their ongoing research or some combination of the two. PowerPoint slides are discouraged in favor of a chalk talk when presenting to the group.

CSBL 5060. Advanced Histology. 2 Credit Hours.
This course, designed for students enrolled in the Anatomical Sciences track of the MS degree program in Cell Systems & Anatomy, will examine the microscopic architecture of organs and their higher level organization into systems performing specific functions. Topics covered will include the integumentary, cardiovascular, respiratory, gastrointestinal, endocrine, urinary and male and female reproductive systems. The goal of this course is to enable students acquire knowledge of normal histological structure of organs and organ systems using light and electron microscopy, thereby providing a strong basis for the sound understanding of cell and tissue morphology in health and disease. The course will include lecture, laboratory and self-directed student learning. A prerequisite for this course is Basic Histology.

CSBL 5074. Introduction to Research. 0.5 Credit Hours.
This course is required of all MS students in the Anatomy Track in Cellular & Structural Biology and is available to the Biotechnology Track students. Students will have the opportunity to learn about the research interests of faculty in the program. This course will introduce students to the research strategies and help them identify a mentor and committee members.

CSBL 5077. Scientific Writing. 2 Credit Hours.
This course will provide students with the opportunity to develop skills in scientific writing and the presentation of research results. It will emphasize learning-by-doing-and-re-doing. Students will be required to write something every week. The capstone project for students will be to write a grant proposal and defend it in front of the class. One hour per week will be devoted to lecture and critique of published work; the other hour will consist of critique and revision of student writing by other students, as well as by the course director. Topics to be covered include: (1) fundamentals of writing clearly, (2) principles of revision, (3) effective presentation of data, (4) fundamentals of oral presentation, (5) writing/presenting to the appropriate audience, (6) how to write background/introductory sections, (7) how to write materials and methods, (8) how to write the discussion section, and (9) how to constructively critique one’s own and others writing.

CSBL 5083. Practical Optical Microscopy. 1 Credit Hour.
This course will be a one-hour elective for graduate students consisting of eight (8) one-hour lectures plus eight (8) one-hour laboratories. The course focuses on the practical aspects of using optical microscopes. The objectives are to teach students the fundamental principles of optical microscopy and to provide them with hands-on experience using the optical instrumentation in the Institutional Imaging Core.
CSBL 5089. Graduate Colloquium. 2 Credit Hours.
This course is designed to provide graduate students with training in evaluating the scientific literature and in presentation of research in a seminar or journal club format. The course will focus on critical thinking, including evaluation of existing literature, interpretation of experimental results, and comparison of alternative models and interpretations. These tools are essential both for oral presentations and for writing grant proposals and manuscripts. Emphasis will be placed on evaluation of the science, organization of the manuscript, and on oral presentation skills.

CSBL 5091. Special Topics. 1-9 Credit Hours.
No description available.

CSBL 5095. Experimental Design And Data Analysis. 3 Credit Hours.
The purpose of the course is to provide an introduction to experimental design and statistical analysis. The emphasis of the course will be on the selection and application of proper tests of statistical significance. Practical experience will be provided in the use of both parametric and nonparametric methods of statistical evaluation. Among the topics to be covered are: data reduction, types of distributions, hypothesis testing, scales of measurement, chi-square analysis, the special case of the comparison of two groups; analysis of variance; a posteriori multiple comparisons tests, tests of the assumptions of parametric analyses, advanced forms of the analysis of variance, linear regression, and correlation analysis. This course involves the use of statistical software; therefore, access to a laptop or a computer with web access for classes and examinations is required.

CSBL 6015. Selective Topics In Oncology: Gynecological Cancers. 2 Credit Hours.
This advanced elective course for the Cancer Biology Track provides a unique learning experience intended to prepare students in the emerging research areas of gynecological cancers for designing research experiments using pre-clinical and clinical research materials. The entire course comprises a small-group format in which students interact closely with a group of faculty who have active research or clinical programs focusing on molecular, clinical, and therapeutic areas of gynecological cancers.

CSBL 6021. Animal Models. 3 Credit Hours.
The relevant biology, applicability, and practical use of a number of animal models to biomedical research is covered. Invertebrate (e.g., C. elegans) and vertebrate (e.g., fish and rodents) model systems are included in the course. Strengths and weaknesses of each organism that render them particularly valuable as animal models are emphasized. Experimental approaches and tools that are utilized in conjunction with each animal model are rigorously examined. The course is taught from primary scientific literature using classic historical publications and recent publications.

CSBL 6040. Gross Anatomy Mentored Teach. 1 Credit Hour.
The Gross Anatomy Mentored Teaching Elective allow students in the Integrated Biomedical Sciences Program, School of Health Professions, and other qualified students to serve as preceptors for the spring CSBL 5022 Interprofessional Human Gross Anatomy course. CSBL 5022 serves students in the occupational therapy, physical therapy, physician assistant and biomedical engineering programs, and students in the Masters of Anatomy graduate program. Preceptors will serve as instructors for laboratory dissections which cover the central and peripheral nervous systems, vertebral column and back, the upper and lower limbs, head and neck, body wall, thorax, abdomen, pelvis, and perineum. Other preceptor duties include preparation of dissection specimens for teaching and demonstration, lab practical exam setup and grading, and preparation and presentation of a brief topical review relevant to anatomy. Students enrolling in this elective must have taken an approved gross anatomy course (as determined and agreed upon by the course directors) with a minimum final grade of B within the previous five years.

CSBL 6048. Biology of Aging. 4 Credit Hours.
Biology of Aging is the core course of the Biology of Aging Track. The course consists of two modules: Aging and Longevity Mechanisms and Molecular and Cellular Mechanisms of Aging. The purpose of this course is to provide students with the most up-to-date information on the current understanding of the aging process. This advanced interdisciplinary graduate course provides experimental understanding of the interrelated areas of aging and age-related diseases. Faculty from several departments will be involved in teaching this course, which will cover the molecular and cell biology of aging, model systems used for aging studies, age-related changes in organs and tissues, and age-related diseases.

CSBL 6049. Cellular and Molecular Mechanisms of Aging. 2 Credit Hours.
This course provides up-to-date information on the current understanding of cellular and molecular mechanisms that contribute to aging. The focus is on investigation of specific mechanisms of aging including oxidative stress, nutrient sensing signaling pathways, stem cells and senescence, and genome stability. Experimental design and analysis, including pros and cons of approaches used to gain knowledge and how to appropriately interpret data, will be discussed throughout the course. The relationship between age-related changes in function and potential contributions age associated diseases will be examined via recently published research.

CSBL 6050. Aging and Longevity Mechanisms. 2 Credit Hours.
This module will focus on and evaluate several approaches used to modulate longevity and how these are used to discover the genetic, physiological and intracellular foundation of aging processes. The course will consist of interactive lectures complemented by guided reading of currently research papers. Students will be taught to hone critical reading skills and develop testable hypotheses to carry research forward. Topics will include: Genetics of Aging, Exceptional Longevity, Pharmacological Interventions, Calorie Restriction, Healthspan and Pathology of Aging.

CSBL 6058. Neurobiology Of Aging. 2 Credit Hours.
The nervous systems of many species, including humans, show obvious declines in function as a result of increasing age. In addition to the gradual decline observed in neural function, it is clear that increasing age also results in increased susceptibility of the nervous system to degenerative diseases such as Alzheimer’s Disease, Parkinson’s Disease, and Amyotrophic Lateral Sclerosis. This course will focus on recent findings and topics related to the underlying pathology of aging in the nervous system and the relationship of aging to neurodegenerative disease.
CSBL 6059. Stem Cells & Regenerative Medicine. 1 Credit Hour.
The fields of stem cells and regenerative medicine are rapidly evolving and have great potential to change the way medicine is practiced. This course will encompass topics from basics of tissue specific stem cell biology to pre-clinical animal models, strategies and progress in regenerative medicine. We will discuss some of the most current research being done in regenerative medicine from stem cell transplantation to biomaterials. Prerequisite: INTD 5000.

CSBL 6060. Anatomical Sciences Thesis. 1-8 Credit Hours.
Designed as an alternative to a "bench research"-based thesis, this longitudinal course for the Anatomical Sciences track in the Masters Program will culminate in the production of a thesis ideally suitable for adaption as a scholarly publication in a peer-reviewed journal. The thesis should focus on assessment of an unanswered and important question on a relevant and approved subject, involve in-depth research and demonstrate critical thinking on the part of the student. A student in the Anatomical Sciences Track will meet with the Course Director during the Spring semester of his/her first year in the program to begin to identify a research area and specific topic(s) for his/her thesis proposal. Areas of focus include (but are not limited to) the following: 1) Clinical Anatomy - anatomy related to medical procedures and/or training of health professionals; 2) Anatomical Variations - comparative research utilizing human cadavers in the gross anatomy laboratories or comparative research in animal models; 3) Anatomical Sciences Education - education research on anatomy teaching methods and approaches to teaching anatomy to health professions students; 4) History of Anatomy - research on the development of human anatomical studies, comparative anatomy concepts, anatomy education, or involving other applications of the humanities to anatomical sciences (e.g. medical illustration, literature, music); 5) Human and rodent micro-anatomy/histology; or 6) Anatomical aspects of a biomedical research endeavor.

CSBL 6064. Genes & Development. 4 Credit Hours.
Genes and Development is the core course of the Genetics, Genomics, and Development Track. The course consists of four modules: genetics, genomics, developmental biology, and stem cell biology. Basic concepts in genetics such as cytogenetics, mitochondrial genetics, cancer genetics, linkage analysis, complex traits, population genetics, animal models, sex determination, and epigenetics will be presented. The genomics section will include historical aspects of the genome project and high throughput analysis. The students are introduced to new techniques in global analysis as well as have hands-on experience. The developmental biology section provides a survey of concepts in developmental biology (induction, cell-cell interactions, morphogen gradients, morphogenetic movements, transcriptional regulation, organogenesis) using experimental examples from both invertebrate and vertebrate embryos. The stem cell biology section includes the following topics: basic biology of stem cells, including embryonic stem cells, adult stem cells, stem cells in different tissues and model systems; microenvironment-mediated and epigenetic regulators of stem cells; stem cells in medicine, including regenerative medicine, cancer, and aging; and ethics. Required for the Genetics, Genomics & Development Track.

CSBL 6068. Cancer Biology Core 1; An Introductory course. 1 Credit Hour.
This course introduces the key features of cancer biology. In particular this course will provide initial insight into the clinical presentation and the cellular processes involved in cancer biology. In addition, it will be an initial presentation of molecular oncology. Topics examined include oncogenes, tumor suppressor genes, apoptosis, control of cell cycle regulation, and control of cellular growth and proliferation. Required for Cancer Biology Discipline. Prerequisites: INTD 5007 (or INTD 6007 and INTD 6009).

CSBL 6069. Cancer Biology Core 2; Advanced Cancer Biology. 2.5 Credit Hours.
This course is designed to provide a detailed representation of cancer biology, from progression, standard of care and molecular alterations that drive recent diagnoses and therapeutic strategies. In addition, this course will offer an overview on special populations affected by cancers and models used in the investigation of cancer. Included are basic experimental methods, mouse models, ex vivo systems, molecular profiling and clinical trials. The conceptual notions on clinical trials of cancer drugs and the process of development of novel therapeutic drugs in cancer will be discussed. Required for Cancer Biology Discipline. Prerequisites: INTD 5007 (or INTD 6007 and INTD 6009) and CSBL 6068.

CSBL 6070. Cancer Biology Preceptoral. 0.5 Credit Hours.
This is a discussion-based course to help unify our cancer biology students. The idea is to work in a small team based manner for students to disseminate knowledge that they are obtaining by participating in advanced courses of different topics by presenting the topic, methods and relevance to cancer biology to their peers. The intent is that participating students will discuss the topic in detail to understand how it might be useful to cancer biology research, in effect an active learning process. The goal is to provide an integrated multidisciplinary view on cancer research. Prerequisites: CSBL 6068 and CSBL 6069.

CSBL 6071. Supervised Teaching. 1-12 Credit Hours.
This course consists of participation in the teaching program of the first-year medical, dental, or health professions curriculum. Semester hours vary depending on the time spent in teaching.

CSBL 6072. Presentation Skills. 0.5 Credit Hours.
This course is designed to provide graduate students in the CSB masters program the opportunity to develop their skills in oral presentation. The course will focus on critical thinking, clear and concise presentation of research endeavors, and communicating science to the public, to students, and to other scientists. The course will meet for 1 hour every other week and is intended for MS students in their second year of study. Part I (Fall Semester) will focus on general scientific presentation skills.

CSBL 6073. Selective Topics In Oncology: Gynecological Cancers. 2 Credit Hours.
This is an advanced elective course for the Cancer Biology Track. The course is a unique learning experience in preparing students in the emerging research areas of gynecological cancers for designing research experiments using preclinical and clinical research materials. The entire course is a small-group format in which student interact closely with a group of faculty who have active research or clinical programs focusing on molecular, clinical, and therapeutic areas of gynecological cancers.
CSBL 6074. Molecular Aspects Of Epigenetics. 2 Credit Hours.
The purpose of this course is to develop an understanding of the molecular aspects of epigenetics. This advanced course will be a unique learning experience that prepares the student to evaluate and design new research in the areas of epigenetic processes including imprinting, gene slicing, X chromosome inactivation, position effect, reprogramming, and the process of tumorigenesis. This module concerns epigenetic mechanisms. Topics include: DNA methylation, histone modifications, epigenetics and stem cells, cancer epigenetics, RNA interference and epigenetics, bioinformatics and epigenetics, and translational epigenetics. This course will include a didactic program and student discussion. For the student discussion module, faculty and students will jointly discuss key publications that serve to bridge the gap between the student’s prior understanding of the field and the state of the art in that area.

CSBL 6075. Cancer Biology Enrichments Course. 0.5 Credit Hours.
This course is a series of enrichment presentations to the students, either in lecture format, visit to labs or attendance of a conference. The goal is to give secondary reinforcements of the didactic components of the core courses on cancer biology. Required for Cancer Biology Discipline.

CSBL 6090. Seminar. 1-9 Credit Hours.
Attendance and participation in the regularly scheduled department seminar series is required each semester the course is offered. The activities included in the seminar course are attendance at invited seminars, journal club, and the student presentations including student annual progress and final dissertation and thesis presentations.

CSBL 6094. Advanced Neuroanatomy. 0.5 Credit Hours.
This course in neuroanatomy is offered to graduate students seeking to advance their knowledge beyond the fundamental level. The course consists of reading from more advanced texts and current anatomical literature as well as dissection of deep white matter tracts within the cortex. The student must also complete a 20-page paper on a neuroanatomical topic.

CSBL 6095. Functional Genomic Data Analysis. 2 Credit Hours.
This course covers basics of genomic data analysis. Focus is on general computational methods, their biomedical basis, and how to evaluate analysis results. Qualitative algorithm descriptions are expected. Prerequisites: CSBL 5095 or Equivalent.

CSBL 6097. Research. 1-12 Credit Hours.
This course consists of independent, original research under the direction of a faculty advisor.

CSBL 6098. Thesis. 1-12 Credit Hours.
This course consists of instruction in the preparation of the thesis. Registration for at least one term is required of M.S. candidates. Admission to candidacy for Master of Science degree is required.

CSBL 6165. Medical Genetics. 3 Credit Hours.
This course provides an introduction to the basic concepts of medical genetics and current areas of medical genetic research. The course reviews basic genetic concepts including the principles of Mendelian and nontraditional inheritance, cytogenetics, molecular genetics, quantitative and population genetics, and discuss important medical aspects of genetic counseling and pedigree analysis, dysmorphology, cancer genetics and counseling for inherited cancers, developmental genetics, prenatal diagnosis, newborn screening, and pharmacogenetics. Diagnosis and current research toward treatment and cure of common genetic disorders affecting metabolism, reproduction, the endocrine system, the functioning of the eye and the nervous system are discussed. An important aspect of the course will be a discussion of ethical issues in medical genetics. A basic background in genetics, cell biology, and biochemistry is assumed. Prerequisites: A basic background in genetics, cell biology, and biochemistry.

CSBL 7014. Anatomy 1. 5 Credit Hours.
This course provides the basic principles of human anatomy. Students have the opportunity to learn human anatomy as it relates to function through the study of bones, cadaver prosections, models, atlas drawings and photographs, and their own bodies. Concentration is on osteology, radiology, arthrology, neuromuscular, vascular, and basic systems anatomy as they apply to physical therapy. Course fees: Lab Assistance fee $10 per hour Gross Anatomy Lab fee $30.

CSBL 7099. Dissertation. 0.5-12 Credit Hours.
Registration for at least one term is required of Ph.D. candidates. Prerequisites: admission to candidacy for Doctor of Philosophy degree.

CSBL 8010. Anatomy 2. 2 Credit Hours.
This course reinforces principles of human anatomy studied in CSBL 7014. Students study human anatomy as it relates to function through cadaver dissection. Concentration is on osteology, radiology, arthrology, neuromuscular, vascular, and basic systems anatomy as they apply to physical therapy. Course fees: Lab Assistance fee $10 per hour Gross Anatomy Lab fee $30 Human Materials fee $865.

EMSP Courses
EMSP 1137. Emergency Procedures 1. 1 Credit Hour.
Application of emergency medical procedures.

EMSP 1149. Pre-Hospital Trauma Life Support. 1 Credit Hour.
This course is an intense skill development in emergency field management, systematic rapid assessment, resuscitation, packaging, and transportation of patients. It includes experiences necessary to meet initial certification requirements.

EMSP 1160. EMT Basic Clinical. 1 Credit Hour.
This course is a method of instruction providing detailed education, training, and work-based experience and direct patient/client care at a clinical site.

EMSP 1161. Clinical 1. 1 Credit Hour.
This course is a method of instruction providing detailed education, training, and work-based experience and direct patient/client care at a clinical site.

EMSP 1162. Clinical 2. 1 Credit Hour.
This course is a method of instruction providing detailed education, training, and work-based experience and direct patient/client care at a clinical site. Prerequisites: EMSP 1161.
EMSP 1201. Anatomy and Physiology for Paramedic Practice. 2 Credit Hours.
A study of the structure and function of the human body, emphasis will be given to the study of cells and tissues, and anatomical and physiological interrelationships of the skeletal, muscular, nervous, and endocrine systems. This course is designed primarily for Paramedic students.

EMSP 1238. Introduction to Paramedic Practice. 2 Credit Hours.
This course is an exploration of the foundations necessary for mastery of the advanced topics of clinical practice out of the hospital. Course Learning Outcomes: At the completion of this module, the student will be required to understand the roles and responsibilities of a paramedic within the EMS system, apply the basic concepts of development and pathophysiology to assessment, and management of emergency patients.

EMSP 1248. Emergency Pharmacology. 2 Credit Hours.
This course is a comprehensive course covering all aspects of the utilization of medications in treating emergencies. The course is designed to complement Cardiology, Special Populations, and Medical Emergency courses. Course Learning Objectives: The student will be required to display a command of general pharmacological terminology, general drug mechanisms, administration routes and administration procedures, and drug dose calculations. Students will be required to demonstrate understanding of the pharmacodynamics, pharmacokinetics, indications, contraindications, possible side effects, and common drug interactions of a variety of medications used in out-of-hospital medical care.

EMSP 1256. Airway Management and Patient Assessment. 2 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in performing patient assessment and airway management. Course Learning Outcomes: At the completion of this module, the student will be required to take a proper history and perform a comprehensive physical exam on any patient, develop a patient care plan, communicate with others, and establish and/or maintain a patent airway, oxygenate, and ventilate a patient. Course fees: Lab materials fee $150.

EMSP 1301. Anatomy and Physiology for Paramedic Practice. 3 Credit Hours.
A study of the structure and function of the human body, emphasis will be given to the study of cells and tissues, and anatomical and physiological interrelationships of the skeletal, muscular, nervous, and endocrine systems. This course is designed primarily for Paramedic students.

EMSP 1338. Introduction to Paramedic Practice. 3 Credit Hours.
This course is an exploration of the foundations necessary for mastery of the advanced topics of clinical practice out of the hospital. Course Learning Outcomes: At the completion of this module, the student will be required to understand the roles and responsibilities of a paramedic within the EMS system, apply the basic concepts of development and pathophysiology to assessment, and management of emergency patients.

EMSP 1344. Cardiology. 3 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with cardiac emergencies. Prerequisite: EMSP 1244.

EMSP 1348. Emergency Pharmacology. 3 Credit Hours.
This course is a comprehensive course covering all aspects of the utilization of medications in treating emergencies. The course is designed to complement Cardiology, Special Populations, and Medical Emergency courses. Course Learning Objectives: The student will be required to display a command of general pharmacological terminology, general drug mechanisms, administration routes and administration procedures, and drug dose calculations. Students will be required to demonstrate understanding of the pharmacodynamics, pharmacokinetics, indications, contraindications, possible side effects, and common drug interactions of a variety of medications used in out-of-hospital medical care.

EMSP 1356. Airway Management and Patient Assessment. 3 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in performing patient assessment and airway management. Course Learning Outcomes: At the completion of this module, the student will be required to take a proper history and perform a comprehensive physical exam on any patient, develop a patient care plan, communicate with others, and establish and/or maintain a patent airway, oxygenate, and ventilate a patient. Course fees: Lab materials fee $225.

EMSP 1444. Cardiology. 4 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with cardiac emergencies. Prerequisite: EMSP 1244.

EMSP 1501. EMT. 5 Credit Hours.
This course is an introduction to the level of EMT Basic. It covers the skills necessary to provide emergency medical care at the basic life support level with an ambulance service or other specialized service.

EMSP 2135. Advanced Cardiac Life Support. 1 Credit Hour.
Instruction satisfies guidelines published by the American Heart Association for their ACLS core curriculum. The focus is on the initial management of the cardiopulmonary arrest patient, including advanced airway management techniques, cardiovascular pharmacology, defibrillation, and arrhythmia analysis. The student must review the current AHA ACLS text prior to class. Successful completion results in ACLS Provider Course Completion Card.

EMSP 2138. EMS Operations. 1 Credit Hour.
This is a course of study to prepare the paramedic to safely manage medical incidents, rescue situations, hazardous materials, and crime scenes.

EMSP 2160. Paramedic Clinical 3. 1 Credit Hour.
A method of instruction providing detailed education training and work-based experience and direct patient/client care at a clinical site. Prerequisites: EMSP 1162.

EMSP 2161. Paramedic Clinical 4. 1 Credit Hour.
This course is a clinical internship requiring each student under close supervision to complete a stated number of objectives in both the hospital and ambulance environment. Clinical courses to be taken in the sequence are listed above. Students are evaluated on cognitive, psychomotor, and affective domains. A numerical grade is awarded based on performance levels and course objectives met. Note: Successful completion of clinical requirements is based on objectives met along with the required Hours. It may be necessary for a student to complete more than the scheduled 375 hours in order to meet the objectives.
EMSP 2164. Paramedic Practicum. 1 Credit Hour.
Practical, general workplace training supported by an individualized learning plan developed by the employer, college, and student.

EMSP 2174. Practicum for Advanced Paramedic Practice. 1 Credit Hour.
Practical, general workplace training supported by an individualized learning plan developed by the employer, college, and student.

EMSP 2177. Emergency Procedures 3. 1 Credit Hour.
Application of emergency medical procedures.

EMSP 2230. Special Populations. 2 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of ill or injured patients in nontraditional populations.

EMSP 2237. Emergency Procedures 2. 2 Credit Hours.
Application of emergency medical procedures.

EMSP 2238. EMS Operations. 2 Credit Hours.
This is a course of study to prepare the paramedic to safely manage medical incidents, rescue situations, hazardous materials, and crime scenes.

EMSP 2243. Assessment-Based Management. 2 Credit Hours.
This course is designed to provide for teaching and evaluating comprehensive assessment-based patient care management.

EMSP 2244. Cardiology. 2 Credit Hours.
A detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with cardiac emergencies.

EMSP 2255. Trauma Management. 2 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with traumatic injuries and to safely manage the scene of an emergency. At the completion of this module, the student will be required to integrate the pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the trauma patient.

EMSP 2274. Medical Emergencies 2. 2 Credit Hours.
Knowledge and skills in the assessment and management of patients with medical emergencies, including medical overview, neurology, gastroenterology, immunology, pulmonology, urology, hematology, endocrinology, toxicology, and other related topics.

EMSP 2278. Advanced Pharmacology. 2 Credit Hours.
Utilization of medications in treating emergency situations with special emphasis on basic principles of pharmacology. This includes the pharmacologic properties of major drug classes and individual drugs, and the clinical application of drug therapy and awareness.

EMSP 2300. Preparation for Professional Practice. 3 Credit Hours.
Theory and skills necessary for the management of cardiac, medical, trauma and pediatric patients specified by American Heart Association and National Association of EMTs guidelines. May be repeated multiple times to improve student proficiency.

EMSP 2330. Special Populations. 3 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of ill or injured patients in nontraditional populations.

EMSP 2334. Medical Emergencies 1. 3 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with medical emergencies. At the completion of this module, students will be required to integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the medical patient.

EMSP 2355. Trauma Management. 3 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with traumatic injuries and to safely manage the scene of an emergency. At the completion of this module, the student will be required to integrate the pathophysiological principles and assessment findings to formulate a field impression and implement the treatment plan for the trauma patient.

EMSP 2371. Physical Exam and History Taking. 3 Credit Hours.
The purpose of this course is to provide the learner with the ability to perform and work in non-traditional and rural settings. Learners will gain the skills of patient assessment, disease identification, health education, and preventative medicine. Learners are given the opportunity to study methods for understanding disease processes through proper techniques for eliciting a complete patient history and performing a thorough physical examination. (Successful completion of Physical Assessment & Airway Management and Physical Examination and History Taking satisfies the Physical Examination and History Taking course requirements for the EHS BS degree).

EMSP 2376. Cardiology 2. 3 Credit Hours.
A study of the fundamentals of electrocardiography with emphasis on the role of the 12-lead ECG for advanced paramedic and community paramedic practice. (Successful completion of Cardiology I and II satisfies the Electrocardiography in EHS course requirement for the EHS BS degree).

EMSP 2378. Critical Care Paramedic. 3 Credit Hours.
The purpose of this course is to provide the learner with advanced knowledge in critical care medicine and to prepare healthcare personnel to function as members of a critical care transport team. Topics will include monitoring technology, advanced procedures, diagnostic testing, and treatment of acutely critical patients. (Successful completion satisfies the Critical Care Paramedic course for the EHS BS degree.).

EMSP 2434. Medical Emergencies 1. 4 Credit Hours.
This course is a detailed study of the knowledge and skills necessary to reach competence in the assessment and management of patients with medical emergencies. At the completion of this module, students will be required to integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for the medical patient.

EMSP 2443. Assessment-Based Management. 4 Credit Hours.
This course is designed to provide for teaching and evaluating comprehensive assessment-based patient care management.

EMSP 3001. Foundations of Emergency Health Sciences. 3 Credit Hours.
This course is an introduction to EMSP. This course surveys the history, evolution, theoretical concepts, and clinical methods and techniques that support the practice of EMSP.

EMSP 3003. Critical Care Medicine. 3 Credit Hours.
This course is designed to provide advanced knowledge in critical care medicine. Topics will include monitoring technology, advanced procedures, diagnostic testing, and treatment of acutely critical patients.
EMSP 3004. Pharmacology 1 for EMS Providers. 3 Credit Hours. This course is designed to provide the learner with a fundamental knowledge of the actions and therapeutic uses of drugs. The topics covered will include basic principles of drug action, pharmacokinetics, autonomic and cardiovascular pharmacology, neuropharmacology, toxicology, endocrine pharmacology, and respiratory tract pharmacology. Open for Cross Enrollment on Space Available basis.

EMSP 3006. Electrocardiology in Emergency Health Science. 3 Credit Hours. A study of the fundamentals of electrocardiology, this course will emphasize the role of the 12-lead ECG in out-of-hospital medical care. The purpose of this course is to teach a systematic-analytical approach to rapid 12-lead interpretation. Topics begin with cardiac anatomy and physiology and progress to the level of recognizing the classic 12-lead and multi-lead ECG patterns. Open for Cross Enrollment on Space Available basis.

EMSP 3007. Human Diseases. 3 Credit Hours. This purpose of this course is to provide a foundation in basic disease conditions, pathophysiological process behind major diseases and their causes, definitions of disease, classifications of disease, and descriptions of diseases as they pertain to the emergency health sciences. Open for Cross Enrollment on Space Available basis.

EMSP 3010. Basic Cardiac Life Support. Credit Hours. Course instruction satisfies AHA guidelines for Basic Cardiac Life Support (BCLS). Successful completion merits AHS BLS Course Completion Card. Topics include basic airway and ventilatory management of the choking and/or unconscious infant, child, and adult; cardiac chest compressions; and automated external defibrillation (AED). AED Standard written and skills exams administered.

EMSP 3011. EMS Informatics. 3 Credit Hours. This course is a class designed to initiate today’s EMS professional to the rapidly advancing field of information science and to acquaint the students with the concepts of electronic field data collection, database theory and its application to EMS, information driven performance improvement, and clinical education.

EMSP 3012. Behavioral Medicine and Psychopathology. 3 Credit Hours. This course provides an opportunity to develop an understanding of human behavior by providing an overview of behavioral disease processes and differentiation criteria to include disease presentation, physical examination findings, laboratory testing, and therapeutic approaches. The course will focus on issues pertinent to the pre-hospital environment including common patient presentation, overview of the legal system with mental health patients, and individual and system interventions.

EMSP 3013. Professional Orientation and Legal Foundations. 3 Credit Hours. This course provides the student with an overview of the legal foundations for Emergency Medical Services. Topics include concepts of malpractice, litigation, consent and refusal of medical treatment, advanced directives, patient confidentiality, and expert and factual witness preparation.

EMSP 3014. Interprofessional Health Care Teams. 3 Credit Hours. Healthcare is a volatile, uncertain, complex, and ambiguous system involving groups and teams of professionals. In an effort to improve general patient population health, the overall health care experience, and reduce the per capita cost of care, this class will explore relational leadership that promotes interdisciplinarity, interprofessionalism, and productive teamwork. During this course, learners will review theories and rich references while participating in activities and stimulating discussions to think differently about their roles and styles as leaders or members of a team.

EMSP 3015. Multicultural Health. 3 Credit Hours. Cultural competence is essential to healthcare professionals. Medical professionals interact daily with diverse groups of people. This course will focus on differences in cultural beliefs about health, wellness, illness, and death, as well as cross-cultural health models and effective communications with the goal of developing and evaluating health promotion programs within the community. Learners will participate in online activities, case studies, and activities.

EMSP 3031. Directed Study. 1-4 Credit Hours. This course is available to the learner to allow for a voluntary course of independent study in a clinical/advanced provider concentration.

EMSP 3041. Current Research In Emergency Health Sciences. 3 Credit Hours. This course is a seminar designed to encourage the learner to discover research and research trends in the field of EMSP. Basic concepts in research methods will be discussed. The learner will have the opportunity to discover methods, procedures, and ways of analysis for examining research.

EMSP 3100. Orientation to Online Learning. 1 Credit Hour. A course designed to provide the student with necessary information, tools, and strategies to enhance and facilitate learning at a distance at the Health Science Center.

EMSP 4001. Physical Examination and History Taking. 3 Credit Hours. This course is designed to assist students in refining history taking, psychosocial assessment, and physical assessment skills. Emphasis is placed on detailed health history taking, differentiation, interpretation, and documentation of normal and abnormal findings. Learners are given the opportunity to study methods for understanding disease processes through proper techniques for eliciting a complete patient history and performing a thorough physical examination. Open for Cross Enrollment on Space Available basis.

EMSP 4002. Pathophysiology for EMS Providers. 3 Credit Hours. This course is designed to introduce the student to pathophysiologic concepts related to altered biological processes affecting individuals across the lifespan. It includes basic mechanisms of disease, the immune response, and selected disorders of the following systems: neurologic, endocrine, reproductive, musculoskeletal, cardiovascular, hematologic, respiratory, urinary, and digestive.

EMSP 4003. Flight Medicine. 3 Credit Hours. This course is designed to provide the learner with general physics of flight as well as the effect that flight has on patients and equipment utilized in patient care. Additionally, general aviation guidelines and safety protocols will be introduced as well as the regulatory structure of flight medicine. Open for Cross Enrollment on Space Available basis.
EMSP 4004. Management of Disasters and Hazard Materials. 3 Credit Hours.
This course discusses considerations of the theoretical and practical foundations necessary to manage multi-casualty and multi-agency incidents, including planning, response, triage, and scene control. Medical, surgical, mental health, and public health views are discussed along with the resolution phases of disaster.

EMSP 4005. EHS Systems Management and Budget. 3 Credit Hours.
This course is designed to identify and discuss various forms and trends of EHS Systems management. From the volunteer service to the large, urban EHS system, the learner will have the opportunity to become familiar with the various aspects of America's EHS services. Budgeting and financial management skills and understanding necessary to manage emergency health systems will be emphasized.

EMSP 4006. Educational Issues in Emergency Health Sciences. 3 Credit Hours.
This course analyzes educational and training needs relating to EMS agencies. Principles of adult teaching and learning are presented.

EMSP 4007. Human Resource Development. 3 Credit Hours.
This course reviews the policies necessary to ensure that properly prepared and motivated personnel are available to carry out the mission and daily operations of an EMS organization and to gain a scholarly understanding of and familiarity with foundational HRD theory and research. Topics include methods of hiring staff, performance appraisal processes, legal requirements around health and safety, union matters, and sexual harassment in the workplace. Open for Cross Enrollment on Space Available basis.

EMSP 4008. Leadership Development. 3 Credit Hours.
This course is a study and application of contemporary leadership theories and conceptual, skill-building, feedback, and personal growth approaches for the development of effective organizational leadership behaviors and practices. Open for Cross Enrollment on Space Available basis.

EMSP 4009. Pediatric Advanced Life Support (PALS). 1 Credit Hour.
Instruction presented satisfies guidelines published by the American Heart Association's ECC for the PALS core curriculum. The focus is on the initial management of the cardiopulmonary arrest pediatric patient including advanced airway management techniques, cardiovascular pharmacology, defibrillation, and arrhythmia analysis. The student must review the current AHA PALS text prior to class. Successful completion results in PALS Provider Course Completion certification.

EMSP 4010. Emer Med Serv-Ambulance. 4 Credit Hours.
Orientation to the San Antonio Fire Department Standard Medical Operating Procedures (SMOPs) and EMS Organization is followed by assignment to SAFD Paramedic Ambulance teams. The student experiences emergency patient encounters involving on-the-scene pre-hospital management of medical, surgical, pediatric, psychological, obstetrical, and social emergencies. Experiences include vehicle extrication, full range of pre-hospital medical and trauma patients, EMS communication procedures, medical-legal situations, conflict resolution, EMS-Police cooperation, BLS/ACLS, hospital diversions experience and patient access to care problems peculiar to EMS. During 40 requisite patient encounters, the student makes brief assessment notes, assists in the care and transportation of patients to the 20 San Antonio Emergency rooms. The rotation also includes EMS Case Discussions, formal classes in comparative EMS organizations, methods of emergency triage, introduction to disaster medicine, management of mass casualties, and a survey of weapons of mass destruction. Prerequisite: Current BLS Certification and successful completion of third year of medical school is required.

EMSP 4011. Contemporary Ethical Dilemmas. 3 Credit Hours.
Contemporary Ethical Dilemmas in Health Professions with special emphasis on out-of-hospital and EMS medical care. This course provides the knowledge necessary to understand ethical behaviors and decision-making in health care and is an introduction to various ethical-legal issues.

EMSP 4012. Pharmacology 2 for EMS Providers. 3 Credit Hours.
This course is designed to provide a fundamental knowledge of the actions and therapeutic uses of drugs. Topics covered include: fluid and electrolyte balance, bone and joint disorders, nutrition, infectious diseases, and cardiovascular and parasitic diseases. Online course. Note: EMSP 3004 Pharmacology I is not a prerequisite for this course.

EMSP 4021. Internship. 6 Credit Hours.
This course is a semester internship/capstone experience by arrangement.

EMSP 4023. Mobile Integrated Healthcare Paramedicine. 3 Credit Hours.
From managing chronic disease to providing preventive care to coordinating health services, the Mobile Integrated Healthcare Paramedic (MIHP)/Community Paramedic (CP) collaborates with a team of health care professionals to address health problems within their communities, reduce hospital readmissions, prevent unnecessary ambulance transports, and help patients manage their medical needs to achieve the best possible long-term outcome. The MIHP course will consist of lessons developed to equip experienced paramedics with the skills they need to succeed in a Mobile Integrated Healthcare program.

EMSP 4031. Independent Study 2-Clinical. 3 Credit Hours.
This course is available to the learner to allow for a voluntary course of independent study in a clinical/advanced provider concentration.

EMSP 4100. Advanced Cardiac Life Support. 1 Credit Hour.
The focus of this course is the initial management of the cardiopulmonary arrest patient including advanced airway management techniques, cardiovascular pharmacology, defibrillation, and arrhythmia analysis. The student must review the current AHA ACLS text prior to class. Successful completion results in an ACLS Provider Course Completion Card. Instruction presented satisfies guidelines published by the American Heart Association's ECC for their ACLS core curriculum.
EMSP 6135. Advanced Cardiac Life Support. 1 Credit Hour.
Theory and skills necessary for the management of cardiovascular emergencies as specified by the American Heart Association (AHA) guidelines. This course was designed to be repeated multiple times to improve student proficiency and available for Master’s level of higher programs.

EMSP 7001. Basic Cardiac Life Support. Credit Hours.
Course instruction satisfies AHA guidelines for Basic Cardiac Life Support. Successful completion merits AHA BLS Healthcare Provider course completion certification. Topics include basic airway and ventilatory management of the choking and/or unconscious infant, child or adult victim, cardiac chest compression techniques, and automated external defibrillation (AED). AHA standard written and skills exams administered.

PHAS Courses

PHAS 5000. Physician Assistant Policy and Practice. 2 Credit Hours.
This course will provide the student with an overview of the assistant physician profession. The course will provide the student with an opportunity to develop an understanding of the profession to include history, social and policy issues, medical ethics, liability, educational philosophy, certification/licensure requirements, and professional concepts/issues, including a team approach to health care. Discussion will include intellectual honesty and academic and professional conduct.

PHAS 5001. Patient Evaluation. 3 Credit Hours.
This course provides the student with an opportunity to develop a theoretical and clinical basis for assessment of the patient. The process, in which a physician assistant utilizes a comprehensive physical, psychosocial, and cultural assessment across the lifespan to gather specific data relevant to common health problems, is demonstrated. Faculty will facilitate laboratory and clinical experiences that will focus on assessment of patients and presentation of findings in a variety of settings.

PHAS 5003. Behavioral Medicine. 3 Credit Hours.
This course provides the student with an opportunity to develop an understanding of human behavior by providing an overview of major behavioral disease processes and differentiation criteria to include disease presentation, physical examination findings, laboratory testing, and therapeutic approaches. Open for Cross Enrollment on Space Available basis.

PHAS 5004. Clinical Applications. 4 Credit Hours.
This course provides the student with an opportunity to experience clinical practice and further develop an appreciation for the art and science of medicine as it relates to physician assistant practice. The student will have an opportunity to apply those skills taught in Patient Evaluation I including physical examination, medical history, patient education, documentation, and medical record keeping. Faculty will facilitate laboratory and clinical experience that will focus on assessment of patients and presentation of findings in a variety of settings. Activities will range from observation to participation in patient care. Basic problem solving, group discussion, and literature review will be included. Open for Cross Enrollment on Space Available basis.

PHAS 5005. Clinical Applications in Nutrition. 2 Credit Hours.
The student will have the opportunity to develop knowledge of the role of nutrition in healthy and disease states. Emphasis will be on nutrition as a component of patient care and treatment.

PHAS 5006. Clinical Applications in Physiology for the Health Professional. 4 Credit Hours.
This course is designed to provide students in health professions discipline with the fundamentals of normal human physiology. The course includes concepts from cellular to system level. Topics include cellular, respiratory, cardiovascular, digestive, renal, male and female reproductive, musculoskeletal, nervous, and endocrine systems with integration of these physiologic concepts to pathologic disease processes. The course includes classroom lecture, case studies and student presentations.

PHAS 5007. Pathogenesis of Human Disease. 3 Credit Hours.
This course covers the basic principles of pathology providing the opportunity for the understanding of human disease processes. Course content includes discussion of general disease processes such as cellular degeneration, inflammation, tissue repair, chemical and physical injury, developmental disorders and neoplasia and a thorough examination of the principal diseases of the major tissues and organ systems. Upon completion of the course the student will have had the opportunity to acquire foundation knowledge of the concepts of pathophysiology applicable and required for clinical diagnosis of human diseases. Open for Cross Enrollment on Space Available basis.

PHAS 5008. Clinical Human Anatomy. 4 Credit Hours.
This course is a study of the structure and function of the human body to include the study of cells, tissues, and organ systems. Emphasis will be on the interrelationship of the human body systems with clinical correlation through the use of case studies, radiographs, photographs, and drawings. This is an outline class with enhanced virtual laboratory sessions. Additional time may be spent with cadaver projections, models, or plastinated specimens. There is an instructional technology fee associated with this course.

PHAS 5009. Principles of Nutrition for the Physician Assistant. 2.5 Credit Hours.
The student will have the opportunity to develop knowledge of the role of nutrition in healthy and disease states. Emphasis will be on nutrition as a component of patient care and treatment. Open for Cross Enrollment on Space Available basis.

PHAS 5011. Principles of Ethics and Professionalism. 1 Credit Hour.
A major component of becoming a critical thinker involves understanding of professional behavior and ethical decision making that may affect others, particularly patients and their families. This course will encourage discussion and analysis of issues that involve professional behavior and ethical conflicts to help PA students prepare for approaching ethical dilemmas. In addition, the course will address ethical issues relating to research.

PHAS 5033. Clinical Medicine I. 10 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are genetics, dermatology, renal/male reproductive, cardiovascular, respiratory, and hematologic.
PHAS 5034. Clinical Medicine 2. 10 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are gastrointestinal, musculoskeletal, neurologic female reproductive, endocrine, and special topics.

PHAS 5035. Clinical Medicine for PA 1. 3 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are genetics, ophthalmology, otolaryngology and dermatology.

PHAS 5036. Clinical Medicine for PA 2. 5 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are: cardiology with EKG, and pulmonology.

PHAS 5037. Clinical Medicine for PA 3. 10 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are: endocrine, and special topics.

PHAS 5038. Clinical Medicine for PA 4. 2 Credit Hours.
This course provides students with all aspects of medical care based on an organ system approach. It will provide students with an opportunity to develop an understanding of human disease states. Instruction will include recognition of disease state through data collection, assessment, management, patient education, and disease prevention. Health disparities will be included. Special topics will include pediatric and geriatric applications. The organ systems to be covered are: urology, hematology, and oncology.

PHAS 5043. Physiology in Health and Disease. 4 Credit Hours.
This course shall provide students with the opportunity to develop a knowledge base of human physiology in health and diseased states. Emphasis will be on the pathophysiology of human disease processes. Course content includes organ system physiology and general disease processes of degeneration, inflammation, neoplasia, and changes associated with major tissue/organ diseases.

PHAS 5044. Clinical Anatomy for Physician Assistants. 5 Credit Hours.
This course uses lecture and laboratory experience to learn gross morphology of the human body including: structural relationships, anatomical variations and radiological correlations. The course will emphasize the application of this anatomical knowledge to clinical practice. Students will conduct a complete cadaver gross dissection in order to reveal the anatomical basis for performing clinical procedures, conduct a physical exam, and assess structures that may be injured or diseased based on a patient presentation. Students are expected to become skilled at identification of anatomical structures, and are also expected to become proficient at recognition of structural arrangements and structural relationships. Students have the opportunity to further their knowledge of anatomy by using computer-assisted technology, which is available online.

PHAS 5091. Special Topics. 1-10 Credit Hours.
This special topics or directed study course is a faculty-directed, didactic opportunity for students. Specific course objectives and study plans will be developed based on student needs and faculty decisions. The course may be used for special projects, additional coursework, or remedial education. It may be repeated for credit.

PHAS 6004. Preventative Medicine-Community Health. 3 Credit Hours.
The student will have an opportunity to develop an understanding and knowledge of epidemiology and preventive medicine across a number of topics. An introduction to community health, with an emphasis on needs assessment and project development, will be done. Open for Cross Enrollment on Space Available basis.

PHAS 6010. Pharmacology 1. 3 Credit Hours.
The student will have an opportunity to develop an understanding and knowledge of the pharmacological basis of therapeutics with special emphasis on the biochemical and physiological functions in disease. Majors areas covered include drugs active in the cardiovascular, autonomic, and central nervous systems. General principles of drug action and specific coverage of drugs used in the treatment of bacterial, viral, and parasitic diseases are provided.

PHAS 6013. Scientific Inquiry. 3 Credit Hours.
This course is a general introduction to research design, statistical reasoning, and interpretation of medical/scientific literature. Topics include scientific method, theory, development of research questions, issues of measurement, models of experimental and non-experimental designs, and an overview of parametric and non-parametric statistical techniques. All topics will be in reference to understanding the literature and to evidence for practice decisions. The learner will have an opportunity to critically analyze medical and scientific literature/research.

PHAS 6014. Pharmacology 2. 3 Credit Hours.
A continuation of Pharmacology 1, the student will have an opportunity to develop an understanding and knowledge of the actions and therapeutic uses of drugs. The topics include principles of pharmacology and pharmacokinetics. Topics will center on drug action, autonomic and cardiovascular pharmacology, neuropharmacology, endocrine pharmacology, GI and respiratory pharmacology, and an introduction to chemotherapy and toxicology. Special topics will include basics in prescription writing.

PHAS 6015. Clinical Skills. 2 Credit Hours.
This course is a continuation of Clinical Skills I. Course Fees: Clinical fee $300.00.
PHAS 6101. Supervised Clinical Practice 1. 4 Credit Hours.
This clinical rotation course is the first in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6102. Supervised Clinical Practice 2. 4 Credit Hours.
This clinical rotation course is the second in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6103. Supervised Clinical Practice 3. 4 Credit Hours.
This clinical rotation course is the third in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6104. Supervised Clinical Practice 4. 4 Credit Hours.
This clinical rotation course is the fourth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6105. Supervised Clinical Practice 5. 4 Credit Hours.
This clinical rotation course is the fifth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6106. Supervised Clinical Practice 6. 4 Credit Hours.
This clinical rotation course is the sixth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6107. Supervised Clinical Practice 7. 4 Credit Hours.
This clinical rotation course is the seventh in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6108. Supervised Clinical Practice 8. 4 Credit Hours.
This clinical rotation course is the eighth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6109. Supervised Clinical Practice 9. 4 Credit Hours.
This clinical rotation course is the ninth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6110. Supervised Clinical Practice 10. 4 Credit Hours.
This clinical rotation course is the tenth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women's health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.
PHAS 6111. Supervised Clinical Practice 11. 4 Credit Hours.
This clinical rotation course is the eleventh in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women’s health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6112. Supervised Clinical Practice 12. 4 Credit Hours.
This clinical rotation course is the twelfth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women’s health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6113. Supervised Clinical Practice 13. 4 Credit Hours.
This clinical rotation course is the thirteenth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women’s health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6114. Supervised Clinical Practice 14. 4 Credit Hours.
This clinical rotation course is the fourteenth in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women’s health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings.

PHAS 6115. Supervised Clinical Practice 15. 4 Credit Hours.
This clinical rotation course is the fifteenth and final rotation in a series of supervised clinical practice opportunities for students who have completed the didactic phase of the Physician Assistant curriculum. This supervised clinical practice experience enables students to meet program expectations and acquire the competencies needed for clinical PA practice. Students will encounter the types of patients essential to preparing them for entry into practice. At a minimum, these experiences will include preventive, emergent, acute and chronic patient encounters. Students will participate in health care across the life span, women’s health, pre-/post and intra-operative care in outpatient, inpatient, emergency and surgical settings and special topics.