

## LARNER COLLEGE OF MEDICINE

The mission of the UVM Larner College of Medicine at The University of Vermont is to educate a diverse group of dedicated physicians and biomedical scientists to serve across all the disciplines of medicine; to bring hope to patients by advancing medical knowledge through research; to integrate education and research to advance the quality and accessibility of patient care; and to engage with our communities to benefit Vermont and the world.

To this mission, Larner is affiliated with the cross-college minor and major in Biochemistry and offers undergraduate minors in Pharmacology and Behavioral Change Health Studies (offered by the Department of Medicine). Additionally, our world-renowned faculty teach undergraduate students in a variety of courses to compliment student interest and advance biomedical research. Larner courses are offered by faculty in the departments of Biochemistry, Medicine, Microbiology and Molecular Genetics, Molecular Physiology and Biophysics, Neurological Sciences, Obstetrics and Gynecology, Orthopedic Surgery, Pathology, Public Health, Pharmacology, Radiology, and Surgery.

For students interested in practical hands-on experience in the biomedical sciences, numerous research opportunities are available in the Larner College of Medicine laboratories for credit, including options for honors theses.

### MINORS

- Behavioral Change Health Studies
- Affiliated with the cross-college minor and major in Biochemistry
- Pharmacology

### Anatomy Neurobiology Courses

#### **ANNB 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

#### **ANNB 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

#### **ANNB 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### **ANNB 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

#### **ANNB 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

#### **ANNB 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### **ANNB 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

#### **ANNB 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Prerequisite: Department permission.

#### **ANNB 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles. Undergraduate only.

#### **ANNB 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

#### **ANNB 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### **ANNB 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

#### **ANNB 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small tea research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

#### **ANNB 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

### Anatomy/Physiology Courses

#### **ANPS 1190. Ugr Hum Anatomy & Physiology 1. 4 Credits.**

Part I of two-semester course sequence. Structure and function of human body.

#### **ANPS 1200. Ugr Hum Anatomy & Physiology 2. 4 Credits.**

Part II of two-semester course sequence. Structure and function of human body. Prerequisite: ANPS 1190.

#### **ANPS 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

#### **ANPS 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**ANPS 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ANPS 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ANPS 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**ANPS 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ANPS 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**ANPS 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Prerequisite: Department permission.

**ANPS 3990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**ANPS 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**ANPS 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ANPS 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**ANPS 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**ANPS 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**Biochemistry Courses****BIOC 1010. Biochem: Modern Perspect I. 1 Credit.**

This is Part I of a sequence to help students develop an understanding of what the field of biochemistry is, its core principles, and what biochemists do. Prerequisites: Biochemistry major, First-year standing.

**BIOC 1011. Biochem: Modern Perspect II. 1 Credit.**

This is Part 2 of a sequence to help students develop an understanding of what the field of biochemistry is, its core principles, and what biochemists do. Prerequisites: Biochemistry major, First-year standing.

**BIOC 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**BIOC 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**BIOC 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**BIOC 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**BIOC 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**BIOC 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**BIOC 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**BIOC 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Written report due at end of each semester. Prerequisite: Instructor permission.

**BIOC 3001. Fundamentals of Biochemistry. 3 Credits.**

Provides a broad introduction to the field of biochemistry. Students will explore the molecular basis and chemical principles of biochemistry pertinent to living systems. This course is taught by LCOM faculty and emphasizes the relevance of biochemistry to health, disease, physiology and medicine. Prerequisites: CHEM 1150, CHEM 1580, CHEM 1550, CHEM 2585, or equivalent; BIOL 1450, BCOR 1450, BCOR 2500, or equivalent.

**BIOC 3003. Fundamentals of Biochem Lab. 1 Credit.**

A companion laboratory course for BIOC 3001 Fundamentals of Biochemistry. Designed to provide students with hands-on biochemical experience that will be useful for a future career in science; focuses on some of the most commonly used techniques in today's biomedical research laboratories. Pre/Co-requisite: BIOC 3001.

**BIOC 3005. Biochemistry I. 3 Credits.**

Introduction to chemistry and structure of biological macromolecules; examination of mechanisms of chemical processes in biological systems including enzyme catalysis, biosynthesis, regulation, and information transfer. Prerequisite: CHEM 1550 or CHEM 2585. Cross-listed with: MMG 3050.

**BIOC 3006. Biochemistry II. 3 Credits.**

Continuation of Biochemistry I. Biochemistry of nucleic acids; nucleic acid based processes, such as replication and transcription; cellular information transfer, genomics, and proteomics. Prerequisite: BIOC 3005 or MMG 3050. Cross-listed with: MMG 3060.

**BIOC 3007. Biochemistry Lab. 3 Credits.**

Introduction to biochemical tools, including spectrometry, chromatography, and electrophoresis; natural and recombinant enzyme isolation; assays of DNA-modifying enzymes; computer-based structure/function exercises. Prerequisite: BIOC 3005 or MMG 3050. Cross-listed with: MMG 3070.

**BIOC 3030. Adv Biochem Lab: Protein CURE. 4 Credits.**

Course-based undergraduate research experience (CURE) designed to develop students' critical thinking and use of the scientific method. Students will read the literature to identify a biological question linked to a specific protein, develop a hypothesis, and test it at the bench. Findings will be presented to their classmates. Prerequisites: BIOC 3005, BIOC 3006, BIOC 3007.

**BIOC 3063. Nutritional Biochemistry. 3 Credits.**

Comprehensive study of the metabolism of the macro-nutrients by humans with emphasis on hormonal control of biochemical pathways, nutritional and metabolic interrelationships and dietary disorders. The biochemistry of the micronutrients and vitamins will also be studied. Prerequisite: BIOC 3001, BIOC 3005, or NFS 2183.

**BIOC 3075. Adv Biochem of Human Disease. 3 Credits.**

The course takes a deep dive into five distinct areas of biochemistry related to a disease or group of diseases primarily through group learning. Key biochemical principles are reviewed and extended. Additionally students will read and discuss a primary literature article with each area. Prerequisites: NFS 2183, BIOC 3001, or BIOC 3005.

**BIOC 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**BIOC 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**BIOC 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**BIOC 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**BIOC 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**BIOC 4084. Biochemistry Senior Seminar. 1 Credit.**

Oral and written presentation of a subject of current biochemical interest. Prerequisite: Senior standing.

**BIOC 4996. Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.

**College of Medicine Undergraduate Courses****COMU 1010. Healthy Brains, Healthy Bodies. 3 Credits.**

Examines the effects the college experience has on the minds and bodies of individuals. Students will learn the basic physiological and psychological factors that are associated with optimal physical and cognitive functioning at every stage of life. Catamount Core: S1.

**COMU 1020. Intro to Medical Imaging. 3 Credits.**

Medical imaging plays a central role in healthcare delivery. Students will learn about X-Ray, CT, MRI, PET, and ultrasound imaging. Their clinical applications and role in healthcare both in the US and around the world will be discussed.

**COMU 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**COMU 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**COMU 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.



**COMU 2182. Mental Health in Pop Culture. 3 Credits.**

Review of literature, film, art, television, music, podcasts, etc. to understand presentations of mental illness and their treatments. Themes such as stigma, stereotyping, vulnerability, psychiatric nosology, the doctor-patient relationship and celebrity culture will be examined. Presentations of neurodiversity will be compared and contrasted with the Western medical worldview and through the lens of entertainment.

**COMU 2220. Family Wellness Coaching. 3 Credits.**

Introduces students to the science behind health promotion in a family setting. Students will learn about motivational interviewing and family based, evidenced based strategies to raise healthy children and keep families healthy in all areas of life. Pre/Co-requisites: COMU 1010.

**COMU 2230. The Effects of Adversity. 3 Credits.**

Provides an understanding of how adversity affects the brain and genome. Students will engage with the science of adversity using case studies, examples from popular media, and a review of the scientific literature. Pre/Co-requisite: COMU 1010.

**COMU 2250. The Science of Happiness. 3 Credits.**

Surveys the science of well-being with a goal toward up-ending the standard medical approach of curing illness or reducing dysfunction in favor of pursuits such as making meaning, pursuing goals, enhancing well-being, and fulfilling potential. Prerequisite: COMU 1010.

**COMU 2310. Sex, Love, Neurosci of Relationships. 3 Credits.**

Surveys the state-of-science of close relationships, sexual behavior, and the human experience of love and intimacy. Examines the neurobiology of love and relationships while exploring aspects of attraction, attachment, affection, identity, pathology, and neurodiversity. Prerequisite: COMU 1010.

**COMU 2500. Sleep and the Brain. 3 Credits.**

Discusses topics including neurobiology of sleep, sleep across the lifespan, and neuropsychological/psychiatric correlates of sleep. Students will also have the opportunity to engage in sleep assessments and debate topics pertinent to sleep science. Prerequisite: COMU 1010.

**COMU 2530. Anxiety, Inattention & the Brain. 3 Credits.**

Provides an in-depth examination of the functional neuroanatomy and clinical phenomenology associated with common emotional and behavioral problems that arise during childhood, adolescence, and early adulthood. Topics will include inattention/hyperactivity, anxiety, depression, autism spectrum, and externalizing problems. Emphasis on human neuroimaging studies. Prerequisite: COMU 1010.

**COMU 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**COMU 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**COMU 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**COMU 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**COMU 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**COMU 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**COMU 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**COMU 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded.

**COMU 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

**COMU 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Molecular Physiology Biophysics Courses****MPBP 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**MPBP 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**MPBP 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**MPBP 2990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**MPBP 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**MPBP 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**MPBP 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**MPBP 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisite: Department permission.

**MPBP 3990. Special Topics. 1-18 Credits.**

Topics of interest to high level Undergraduate and Graduate students beyond the scope of existing courses.

**MPBP 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**MPBP 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**MPBP 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**MPBP 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Neuroscience Courses****NSCI 1010. Topics In: First-Year Seminar. 3 Credits.**

Intensive first-year seminar focused on specific themes and/or disciplinary perspectives. Emphasis on developing critical reading and writing skills, substantive revision, information literacy, and analytical thinking. First-year seminars are frequently organized to meet one of the disciplinary Catamount Core requirements. Topics vary by offering; periodic offering at intervals that may exceed four years.

**NSCI 1020. Topics In: LASP Writing. 3 Credits.**

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program.

**NSCI 1025. Topics In: LASP Seminar. 3 Credits.**

Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program.

**NSCI 1070. First-Year NSCI Seminar. 1 Credit.**

Introduces first-year neuroscience majors to the field of neuroscience by introducing students to different perspectives and subfields through researchers and students at UVM.

**NSCI 1990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**NSCI 2100. Exploring Neuroscience w/lab. 0 or 4 Credits.**

In-depth survey of neuroscience topics, including neuron function, the anatomical and functional organization of the nervous system, and diseases of the nervous system. With lab. Credit not awarded for both NSCI 2100 and NSCI 2105. Prerequisites: PSYS 1400; and one of the following: (BIOL 1400, BIOL 1450), (BCOR 1400, BCOR 1450), BCOR 1425, or (ANPS 1190, ANPS 1200). Pre/Co-requisites: CHEM 1400. Catamount Core: N2.

**NSCI 2105. Exploring Neuroscience. 3 Credits.**

In-depth survey of neuroscience topics, including neuron function, the anatomical and functional organization of the nervous system, and diseases of the nervous system. No laboratory. Credit not awarded for both NSCI 2100 and NSCI 2105. Prerequisites: PSYS 1400; and one of the following: (BIOL 1400, BIOL 1450), (BCOR 1400, BCOR 1450), BCOR 1425, or (ANPS 1190, ANPS 1200). Co-requisite: CHEM 1400. Catamount Core: N1.

**NSCI 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**NSCI 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**NSCI 3220. Cellular Neurophysiology. 3 Credits.**

Fundamentals of cellular neurophysiology through lecture, independent student reading and faculty-led group discussions of journal articles. Prerequisites: NSCI 2100 or NSCI 2105 or Instructor permission.

**NSCI 3230. Neurochemistry. 3 Credits.**

Using current primary papers on these topics, studies the current state of neuroscience research and examine the basis of neural disorders including neurodegeneration, psychiatric abnormalities such as anxiety and related stress-associated disorders, and other neuropathologies. The papers will dissect methodologies, approaches and advances in these issues.

**NSCI 3250. Human Neuroanatomy. 0 or 3 Credits.**

Functional anatomy of the human nervous system on both the microscopic and macroscopic scales. Focuses on the structures of the peripheral nervous system, spinal cord, and brain, and how they work together to achieve behavior. Lectures and a required laboratory (gross and microscopic anatomy). Prerequisite: NSCI 2105.

**NSCI 3500. Neuroregeneration. 3 Credits.**

Clinical neuroscience of injury and healing in the human nervous system, factors leading to different outcomes, and the impact of successful and failed repair on functional recovery. Explores cutting-edge approaches to treating neurological disease. Prerequisite: NSCI 2100, NSCI 2105, or BIOL 3505.

**NSCI 3610. Neurobiology for Majors. 3 Credits.**

Exploration of the fundamental concepts in neurobiology. Topics include cell biology of the nervous system, electrical signaling/synaptic transmission, signal transduction, plasticity, and motor and sensory systems, and behavioral neuroscience. Credit not awarded for both BIOL 3505 and NSCI 3505. Prerequisites: BCOR 2300; NSCI 2105 or NSCI 2100.

**NSCI 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**NSCI 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**NSCI 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**NSCI 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**NSCI 4500. Diseases of the Nervous System. 3 Credits.**

Senior level, seminar-style capstone course in which students bring together information learned in other courses for an in-depth study of disease states of the nervous system. Prerequisites: NSCI 2100 or NSCI 2105; Senior standing. Catamount Core: N1.

**NSCI 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**NSCI 4994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**NSCI 4996. Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.

**Obstetrics Gynecology Courses****OBGY 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisite: Instructor permission required.

**OBGY 3990. Special Topics. 1-18 Credits.**

Lectures, readings and discussion for advanced students within areas of expertise of faculty and staff.

**OBGY 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Orthopedic Surgery Courses****ORTH 3910. Rsch in Orth & Rehab. 3 Credits.**

Work on research problem under the direction of a faculty member. Review of literature, preparation of manuscript. Prerequisite: Instructor Permission. In collaboration with clinical faculty of the Department.

**ORTH 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**ORTH 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Pathology Courses****PATH 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.



**PATH 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PATH 1993. Independent Study. 1-18 Credits.****PATH 2010. Intro to Human Disease. 3 Credits.**

Elementary course in human pathology designed for Allied Health students. First portion deals with general mechanisms of disease, followed by disorders of specific organs. Prerequisites: ANPS 1190 and ANPS 1200.

**PATH 2990. Special Topics. 1-18 Credits.****PATH 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PATH 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PATH 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PATH 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PATH 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**PATH 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PATH 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PATH 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PATH 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Public Health Courses****PH 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**PH 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PH 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PH 2000. Careers in Public Health. 1 Credit.**

Students learn the public health functions and services through the lens of the public health workforce. Careers in public health and related fields are explored.

**PH 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**PH 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PH 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PH 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PH 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PH 3990. Special Topics. 1-18 Credits.****PH 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PH 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PH 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PH 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**Pharmacology Courses****PHRM 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**PHRM 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PHRM 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PHRM 2990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**PHRM 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PHRM 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PHRM 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PHRM 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PHRM 3000. Medical Cannabis. 3 Credits.**

An introduction to the pharmacology underlying recreational and medicinal uses of Cannabis. Focuses on Cannabis taxonomy, chemistry of cannabinoids, physiological effects, and emerging therapeutic applications. Discusses historical, political and socio-economic influences on medical marijuana legislation. Prerequisite: Introductory Biology and Chemistry courses, organic chemistry or PHRM 3010 recommended.

**PHRM 3010. Pharmacology and Therapeutics. 3 Credits.**

Focuses on biochemical and physiological actions of prototype drugs used in the treatment and prevention of human diseases. Prerequisite: Introductory courses in Biology and Chemistry. Pre/Co-requisite: Organic chemistry recommended.

**PHRM 3720. Toxicology. 3 Credits.**

This course is intended to provide an understanding of the chemical, biochemical and physiological factors that determine the pathological effects of chemicals in living systems. Prerequisites: Organic chemistry, background in Biology, or Instructor permission.

**PHRM 3900. Topics Molecular&Cell Pharm. 3 Credits.**

Focuses on basic principles, drug interactions with receptors, membranes, synapses, neurotransmitters, macromoles, cytoskeleton, ion channels and pumps, and mechanisms of drug resistance. Prerequisite: Introductory course in organic chemistry, background in physiology or health sciences.

**PHRM 3990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**PHRM 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PHRM 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PHRM 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PHRM 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Prerequisite: PHRM 3010. Offered at department discretion.

**Surgery Courses****SURG 1990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.



**SURG 1991. Internship. 1-3 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**SURG 1993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**SURG 2990. Special Topics. 1-18 Credits.**

See schedule of courses for specific titles.

**SURG 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**SURG 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**SURG 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**SURG 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**SURG 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles. Prerequisite: Instructor permission.

**SURG 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**SURG 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.