

Neuroscience

Faculty:

Professors Lauren Howard and Karen Hinkle; Associate Professor Scott Page (Chair), Assistant Professors Megan Doczi (Neuroscience Program Director), Allison Neal and Simon Pearish; Lecturers Virginia Kunkel and Kylie Cowens

The Neuroscience major exposes students to a rapidly growing field at the intersection of biology and psychology. Educating students about the human nervous system in health and disease prepares them for managing the public health challenges of our global population, while exposing them to interdisciplinary learning at the earliest stages of their undergraduate careers. Neuroscience graduates draw knowledge from a variety of specialties, effectively mastering the human nervous system from cellular, molecular, biochemical, cognitive, and behavioral perspectives.

Through the inherently diverse nature of the Neuroscience field, students engage in a broad-based curriculum spanning multiple disciplines. During the first year of study, the Neuroscience curriculum introduces students to fundamental concepts in biology, psychology, chemistry, and mathematics, while developing communication skills through concurrent introductory English courses. Successful students will progress to intermediate level courses designed to provide a thorough background in the anatomy and physiology of the human nervous system, with an emphasis on cellular and molecular biology, and carbon compounds. The third year of the Neuroscience major builds upon the knowledge gained in previous years by engaging students in applied research methods courses, coupled with an analytical reasoning of the natural properties of the physical world. The third and fourth year curricula seek to refine the students' understanding through specialized courses detailing the human nervous system through health and disease. With five free electives, the third and fourth years of study also offer the flexibility for students to pursue a minor in a discipline of their choice.

Mission:

The mission of the Neuroscience curriculum is to provide undergraduate students with a working knowledge of the human brain and nervous system, while emphasizing a strong foundation in the natural sciences.

Goals:

- To educate students about the human nervous system in health and disease
- To prepare students to manage the public health challenges of our global population

Outcomes:

- Acquire a basic proficiency for information literacy and exercise effective written and oral communication skills.
- Conduct hands-on, experiential laboratory research, effectively exposing students to common experimental methodology, approach, and design within the Neuroscience discipline.
- Demonstrate a fundamental competency in Neuroscience via an array of disciplines including biology, psychology, chemistry, physics, and mathematics.

Careers for this Major:

- Healthcare
- Education
- Biotechnology
- Research and Development
- Pharmaceutical Industry
- Neuroimaging
- Neuropsychology
- Science Writing
- Medical Liaison

B.S. in Neuroscience - Curriculum Map 2016-2017 Catalog

Print as PDF Curriculum Map (<http://catalog.norwich.edu/archives/2016-17/residentialprogramscatalog/currmaps/neuro>)

Freshman			
Fall	Cr.	Spring	Cr.
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
BI 101 Principles of Biology I	4	PY 211 Introduction to Psychology	3
CH 103 General Chemistry I	4	CH 104 General Chemistry II	4
MA 107 Precalculus Mathematics (General Education Math)	4	MA 108 Applied Calculus (General Education Math)	4
Semester Total Credits	15	Semester Total Credits	14
Sophomore			
Fall	Cr.	Spring	Cr.
BI 215 Human Anatomy & Physiology I	4	BI 306 Cell Biology	4
BI 202 Genetics	4	MA 232 Elementary Statistics	3
CH 225 Organic Chemistry I	4	PY 263 Perception	3
PY 230 Biopsychology	3	General Education Literature	3
		Free Elective	3
Semester Total Credits	15	Semester Total Credits	16
Junior			
Fall	Cr.	Spring	Cr.
BI 370 Introduction to Neuroscience	4	PY 344 Cognition	4
PS 201 General Physics I	4	PS 202 General Physics II	4
BI 300-400 Elective OR	4-3	General Education History	3
PY 313 Experimental Psychology I		BI 300-400 Elective OR	3-4
Free Elective	3	PY 314 Experimental Psychology II	
		Free Elective	3
Semester Total Credits	15-14	Semester Total Credits	17-18

Senior			
Fall	Cr.	Spring	Cr.
BI 415 Neuroanatomy	4	BI 420 Diseases of the Nervous System	4
BI 401 Senior Seminar (OR)	3	BI Elective	4
PY 401 Senior Seminar (General Education Capstone)		General Education Arts & Humanities	3
PH 303 Survey of Ethics (OR)	3	Free Elective	3
PH 350 Medical Ethics			
PY Elective	3		
Free Elective	3		
Semester Total Credits	16	Semester Total Credits	14
Total Credits For This Major: 122			

Neuroscience Minor Curriculum Map 2016-2017 Catalog

The Neuroscience option is a Concentration for the Psychology major, a minor for all other students.

All courses must be passed with a C or higher.

BI 215	Human Anatomy & Physiology I	4
BI 370	Introduction to Neuroscience	4
PY 230	Biopsychology	3
PY 344	Cognition	4
Choose one Biology course from below: ¹		
BI 302	Embryology	4
or BI 304	Physiology	
Choose one Psychology course from below: ¹		
PY 212	Abnormal Psychology	3
PY 220	Developmental Psychology	3
PY 263	Perception	3
PY 352	Learning and Memory	4
Total Cr.		22-23

¹ Students may also choose the following two chemistry courses: CH 324, CH 325, in lieu of the additional biology/psychology courses. However, this option requires additional prerequisites: CH 103, CH 104 and either CH 205, CH 226 or concurrent enrollment in CH 226.

Courses

PY 210 Psychology of Leadership 3 Cr.

This course is designed to introduce students to the theoretical aspects of leadership, and to help them understand how theory applies to real situations. Topics include leadership models, leader behavior, leadership skills, followership, teams and motivation. Students will be expected to analyze cases, current situations and their own leader style.

PY 211 Introduction to Psychology 3 Cr.

An introduction to psychology as the science of behavior. Topics to be discussed will include learning, motivation, emotions, perception, personality, tests and measurements, and additional selected topics.

PY 212 Abnormal Psychology 3 Cr.

A course on the origin and development of psychopathology with emphasis on the biological, social, and psychological determinants. Prerequisite: PY 211 or permission of the instructor.

PY 220 Developmental Psychology 3 Cr.

A lifespan study of normal development with emphasis on physical, intellectual, social, and emotional growth. Prerequisite: PY 211 or permission of the instructor.

PY 230 Biopsychology 3 Cr.

This course is a survey of the neurophysiological bases of human behavior. Topics include basic brain anatomy and physiology, neurotransmitters and drugs, sensation and perception, learning and memory, sleep, and neurological disorders.

PY 232 Engineering Psychology 3 Cr.

The objective of this course is to expose students to the theoretical foundations of research in human factors. Students will be introduced to basic concepts in psychology such as perception, attention, decision making, and motor control. Knowledge of these concepts is critical for the intelligent design of human-technological systems.

PY 234 Forensic Psychology 3 Cr.

A survey of psychological research and theory dealing with criminal behavior and the legal system. Topics include prediction of violent behavior, sexual assault, victimization, juvenile delinquency, scientific jury selection, criminal investigation and profiling, eyewitness testimony, assessment of mental competency, lie detection, DNA testing, and forensic science.

PY 236 Cross-Cultural Psychology 3 Cr.

This course will expose students to the influence of culture on human behavior, and will illustrate differences and commonalities in behavior (verbal and non-verbal), attitudes, and values across a range of cultures around the world. Issues concerning cultural contact and inter-cultural relations will be considered to enhance a student's ability to deal with and understand variations in human behavior across cultures and ethnic groups. Methodological issues of particular importance to cross-cultural research will be discussed.

PY 238 Political Psychology 3 Cr.

This course will examine key research in political psychology which includes the interactions of political and psychological processes and their impact on behavior in personal, local and global communities.

PY 240 Introduction to Social Psychology 3 Cr.

A general survey of theories, methods and research on individual behavior in a social context. Among topics to be considered are: aggression, interpersonal attraction, affiliation, person perception, attitudes, group processes, and social influence. Prerequisite: PY 211.

PY 241 Introduction to Personality Theory 3 Cr.

An overview of selected influential statements regarding the structure, dynamics, and development of the human personality. Included are the theories of the Freudians (Freud, Jung, Adler), the Environmentalists (Dollard and Miller, Skinner), and the Existentialists and Humanists (Rogers, Maslow, Frankl). Comparisons among theorists are organized around philosophical and historical themes. Prerequisite: PY 211.

PY 263 Perception 3 Cr.

Coverage of the major themes and research in perception. Topics include perception of color, form, motion, depth, illusions, perceptual learning, development, and the physiology of perception. Prerequisite: PY 211 or permission of the instructor.

PY 299 Leadership at Norwich Univ. 3 Cr.**PY 2XX Psychology Elective 3 Cr.****PY 313 Experimental Psychology I 3 Cr.**

A course on the principles and skills required to plan, execute, and interpret psychological research. Topics include the nature of science, the value of empirical evidence, psychology viewed as a science, the logic of experiments, and the ethics of using human subjects. Students are taught to develop a testable idea, to write and read research reports, and to design, conduct, and analyze univariate and correlational studies. Prerequisite: PY 211 or permission of the instructor.

PY 314 Experimental Psychology II 3 Cr.

This course will teach students how to design, conduct, and report psychological experiments. The purpose of the course is to link the academic subject matter of psychology to the conduct of research in the laboratory and the field. Topics include the nature of science, formulation of hypotheses, measurement and reliability, research methods (including experimental, correlational, and observational techniques), research design, and ethics of using human subjects. Issues of experimental control, its relation to confounding and research design, and internal and external validity will be included. The course will also focus on the teaching of library research and scientific writing skills. Students will design, implement, analyze, and report results of several research projects. Prerequisite: PY 313, or MA 232, or permission of instructor.

PY 321 Organizational Psychology 3 Cr.

An analysis of organizational behavior including motivation, climate, leadership, and the use of such techniques as behavior modification in changing human behavior. Theoretical consideration will be followed by application experiences through role playing and case analysis. Prerequisite: PY 211 or permission of the instructor.

PY 324 Adolescent Psychology 3 Cr.

This course examines the physical, emotional, social, cognitive aspects of adolescence from a developmental perspective. Identity, autonomy, sexuality, achievement, and intimacy are examined within the context of the school, the peer group, and the family. Students will have the opportunity to work with adolescents in schools, recreational centers, counseling centers, or through youth service agencies. Required for secondary teacher licensure candidates. Prerequisite: PY 211.

PY 344 Cognition 4 Cr.

Overview of research and theory on human cognitive processes emphasizing the acquisition, storage, representation, retrieval and use of knowledge. Topics include memory, concept formation, language and thought, problem solving and creativity, and cognitive development. Laboratory will include hands-on experiments in cognitive research paradigms.

PY 350 Environmental Psychology 3 Cr.

A study of the relationship between people and the environment, the use of space as a means of regulating social interaction, and human responses to environmental stressors such as overcrowding, toxic agents, noise, air, and water pollution. Also a brief look at ecological psychology in which setting-specific rather than person-specific determinants of a person's reaction to the environment are analyzed. Prerequisites: PY 211.

PY 352 Learning and Memory 4 Cr.

This course provides an overview of historical and current research findings in the area of learning and memory. The subject will be approached from various theoretical approaches, including behaviorist, cognitive, and neurobiological paradigms. Laboratory will include hands-on experiments using research paradigms from the field of learning and memory.

PY 355 Psychology and the Law 3 Cr.

A course that examines the research of psychology as it relates to the judicial process; the nature, source, and development of antisocial behavior; and forensic psychology relative to the development of law and policy at the national and international levels. Prerequisites: PY 211.

PY 360 History and Systems of Psychology 3 Cr.

An overview of significant movements, theories and individuals in the development of contemporary psychology. The course is organized around significant themes and includes discussion of the philosophy of scientific growth, structuralism, functionalism, behaviorism, Gestalt psychology and psychoanalysis. Included will be examples, cases, and discussions of the APA ethics code that governs the performance of professionals in the field of psychology. This course satisfies the university's General Education Ethics requirement. Prerequisite PY 211.

PY 398 Thesis Preparation 3 Cr.

The students will prepare a senior thesis prospectus in accordance with the ethical standards of the Human Subjects Committee. This course precedes PY 498. Prerequisites: PY 211, PY 313, PY 314.

PY 3XX Psychology Elective 3 Cr.**PY 401 Senior Seminar 3 Cr.**

This course is the capstone experience marking the end of a student's undergraduate studies. Students both majoring and minoring in psychology will be provided the experience of synthesizing their learning across their courses in the context of a liberal arts education. Prerequisites: PY 211, PY 313, PY 314.

PY 402 Conference 0 Cr.

Each Psychology major, must during his/her tenure at Norwich attend at least one professional Psychology meeting.

PY 403 Presentation 0 Cr.

In order to complete the process of psychological inquiry and communication, each psychology major must present his/her senior research at an appropriate professional forum, spring semester, senior year.

PY 451 Thematic Seminar 3 Cr.

A seminar course which deals with particular theories or areas of psychology not elsewhere covered in depth or within present course offerings. Prerequisite: PY 211 and permission of the instructor.

PY 452 Thematic Seminar 3 Cr.

A seminar course which deals with particular theories or areas of psychology not elsewhere covered in depth or within present course offerings. Prerequisite: PY 211 and permission of the instructor.

PY 453 Internship 3-9 Cr.

Assignments will include work and observation in local, state, and federal institutions or agencies concerned with the education, health, or the protection of society. Written and oral reports. Prerequisites: PY 211 and permission of the instructor.

PY 471 Directed Readings 3 Cr.

A course in which there is an opportunity to select and read in a specific area of interest that is not available through regular course offerings. Prerequisites: three psychology courses and permission of the instructor.

PY 498 Senior Thesis 3 Cr.

A research course designed to enable a student to experience all phases of the experiment from literature research, experimental design, data collection and analysis, and written and oral reports. The student will learn all of the procedures, considerations, and standards necessary to ensure the ethical treatment of human participants. Prerequisites: PY 211, PY 313, PY 314, PY 398.

PY 4XX Psychology Elective 3 Cr.