

**DEPARTMENT OF NEUROSCIENCE,
CELL BIOLOGY AND PHYSIOLOGY**

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Master's Graduate Programs in the Department of Neuroscience, Cell Biology, and Physiology (NCBP)

Master's Degree in Anatomy

Graduate study in anatomy provides advanced professional education in the essentials of human anatomy, including three core courses: human gross anatomy, human physiology, and neurobiology, as well as several elective courses. The Master's Degree in Anatomy offers three programs of study – a thesis option, course option and teacher education option. The Master's Degree in Anatomy is designed primarily for students who expect to continue to more advanced degrees (such as Ph.D., M.D., D.O., D.D.S., P.A. or the equivalent) or for students who want to teach anatomy.

Certificate in Anatomy

The NCBP Department also offers a Certificate Program in Anatomy. This program is for students who have an interest in anatomy but do not want to pursue, or who do not need, a Master's Degree. The program of study consists of three core graduate anatomy courses.

Master's Degree in Physiology and Neuroscience

Thesis option

Physiology and Neuroscience - In order to qualify for the Master of Science degree – thesis option, students must satisfy the requirements of the Graduate School as well as program requirements. The first two semesters involve 17 credit hours, which include required departmental and other courses determined in consultation with the student's advisor. Research activities begin in the second semester of the first year. The second program year involves 13 credit hours with emphasis on research. Completed research is presented in written thesis form at the end of the second year, with a public oral defense.

Course Option

Physiology and Neuroscience - In order to qualify for the Master of Science degree – course option, students must satisfy the requirements of the Graduate School as well as program requirements. The experiential component of the degree is provided by writing intensive courses that engage the student in experimental design and literature-based research.

Goal Statements

The goals of the NCBP graduate programs are to provide the opportunity for graduate students to apply their knowledge of the biomedical sciences to solve an original problem and to achieve a high level of professional competence. All graduates of the Department's Master of Science Programs develop a depth of understanding of human anatomy or human physiology/neuroscience and are afforded the opportunity to prepare for a career in the biomedical sciences or to prepare for further professional study following graduation.

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Master of Science Degree in Anatomy

The Master's degree, *Course Option*, allows the student to plan a program of study that satisfies educational needs and career objectives as well as meeting degree requirements.

The Course Option – 30 credits. The Course Option requires successfully completing a minimum of 30 credits of graduate-level course work offered by the College of Science and Mathematics. This option is designed primarily for those who plan to go on for further graduate or professional training. The pace of the curriculum is designed to permit adequate time to achieve excellence in the course work. Full-time students generally complete the Course Option program in four or five semesters. Below is a *suggested* course of study for this option.

Core courses (total 20 credit hours):

Course number	Course title	Credit hours
ANT 7110	Human Gross Anatomy	6
ANT 7310	Human Neurobiology	4
PN 6100	Human Physiology	4
ANT 6030	Biomedical Article Review	2
ANT 6040	Biomedical Experimental Design	2
ANT 7900	Anatomy Seminar I	1
ANT 7900	Anatomy Seminar II	1

Elective courses:

Course number	Course title	Credit hours
ANT 7210	Human Microanatomy	3
ANT 7150	Human Embryology	3
ANT 7000	Topics of Instruction	2
ANT 7020	Special Dissection	1-3
PN 6300	Medical Cell Biology & Physiology	3
PN 6400	Developmental Neuroscience	3
PN 6550	Neuron-glia Biology and Disease	3
PN 7760	Intercellular Communication	3
BMB 7500	Molecular Biochemistry	3
MI 6200	Neuronal-immune Cross Talk in Homeostasis	3

*Students holding GTA positions are *required* to enroll in Topics of Instruction (ANT 7000) during the semesters in which they teach. For students not holding a GTA position, the requirement to serve as a Teaching Assistant for one semester can be scheduled in any of the semesters of the second year. Therefore, the sequence of courses for the second year will vary according to the teaching assignment.

Master of Science Degree in Anatomy

The Master's degree, *Thesis Option*, is intended for those students who need or desire the full range of professional experience including intensive research and writing. This option assures training in research techniques and in the preparation of scholarly papers which culminates in the preparation and defense of a thesis based on original research. The student's program of study is an initiation into methods of intense study and research in some selected area of anatomy.

The Thesis Option – 30 Credits. The purpose of the Thesis Option is to provide the student with a strong research-oriented background in one of several areas of anatomy. A program of study is designed for each student by the student's faculty advisor and an advisory committee. Course work for the first three quarters is essentially the same as that of the Course Option described above. The second year is devoted almost exclusively to research and culminates in the writing and oral defense of a thesis based upon original research performed while enrolled as a graduate student at the university. The Thesis Option requires successfully completing a minimum of 30 credits of graduate-level course work offered by the College of Science and Mathematics and defending a research thesis.

The number of students selected for the Thesis Option is *limited* and depends on the availability of research topics and advisors, as well as the student's research and educational interests. Two years in residence are normally required to complete the Thesis Option, although this length of time may vary depending on the background and goals of the student. Below is a *suggested* course of study for this option.

Core courses (total possible 30 credit hours):

Course number	Course title	Credit hours
ANT 7110	Human Gross Anatomy	6
ANT 7310	Human Neurobiology	4
PN 6100	Human Physiology	4
ANT 7900	Anatomy Seminar I	1
ANT 7900	Anatomy Seminar II	1
ANT 8990	Anatomy Research	1-14

Elective courses:

Course number	Course title	Credit hours
ANT 7210	Human Microanatomy	3
ANT 7150	Human Embryology	3
ANT 7000	Topics of Instruction	2
ANT 7020	Special Dissection	1-3
PN 6300	Medical Cell Biology & Physiology	3

PN 6400	Developmental Neuroscience	3
PN 6550	Neuron-glia Biology and Disease	3
PN 7760	Intercellular Communication	3
BMB 7500	Molecular Biochemistry	3
MI 6200	Neuronal-immune Cross Talk in Homeostasis	3

*Students holding GTA positions are *required* to enroll in Topics of Instruction (ANT 7000) during the semesters in which they teach. For students not holding a GTA position, the requirement to serve as a Teaching Assistant for one semester can be scheduled in any of the semesters of the second year. Therefore, the sequence of courses for the second year will vary according to the teaching assignment.

Master of Science Degree in Anatomy – Teacher Education

The Master's degree, Teacher Education Option, allows the student to plan a program of study that satisfies educational needs and career objectives as well as meeting degree requirements. Additional to required graduate anatomy courses, certain courses offered by the College of Education and Human Services, are essential (see the table below) to complete the program. The Teacher Education option also includes a supervised practicum, and the opportunity to help teach in one or more of the department's graduate or undergraduate courses.

The Teacher Education Option – 30 credits. This option requires successfully completing a minimum of 30 credits of graduate-level course work offered by the College of Science and Mathematics and the College of Education and Human Services. This option is designed primarily for those who plan to teach anatomy at the college level. The pace of the curriculum is designed to permit adequate time to achieve excellence in the course work. Full-time students generally complete the Teacher Education Option program in five semesters. Below is a *suggested* course of study for this option.

Core courses (total 26 credit hours):

Course number	Course title	Credit hours
ANT 7110	Human Gross Anatomy	6
ANT 7310	Human Neurobiology	4
PN 6100	Human Physiology	4
ANT 7900	Anatomy Seminar I	1
ANT 7900	Anatomy Seminar II	1
ED 6660	Adolescent and Young Adult Integrated Science: Curriculum and Materials I	3
ED 6840	Measurement and Assessment in Education	3
ED 6460	Field Experience	1
ANT 7550	Practicum Literature review	3

ED 6460 - AYA Internship Part I: Methods IS

Credit Hour(s): 1

Candidates, mentored by a science educator, shall assist in the planning, organizing, delivering, and assessing of instruction in a 7-12th grade setting applying pedagogical content knowledge from science content and methods courses.

Corequisite(s): ED6890

Enrollment Restrictions: Must be enrolled in one of the following Concentrations: Integrated Science. Must be enrolled in one of the following Levels: Graduate, Medical, Professional.

Level: Graduate

Schedule Type(s): Internship

Course attributes: Instructor Approval Required

ANT 7550 Practicum Literature review

Credit Hour(s): 3

Students will independently create the document, with input from a faculty mentor who will guide the development of the outline and provide feedback on drafts of the individual sections. The final complete document will be reviewed and feedback will be provided by a committee of three faculty, including the mentor. The student will have the opportunity for 1 rewrite, after which the committee will grade the final document. Department Managed

Prerequisite(s): Graduate level ED 6160 Minimum Grade of C (ED 6160 can be taken concurrently) and Graduate level ED 6660 Minimum Grade of C and Graduate level ED 6840 Minimum Grade of C

Enrollment Restrictions: Must be enrolled in one of the following Levels: Graduate, Medical, Professional.

Level: Graduate

Schedule Type(s): Practicum

Course attributes: Instructor Approval Required

Elective courses:

Course number	Course title	Credit hours
ANT 7210	Human Microanatomy	3
ANT 7150	Human Embryology	3
ANT 7000	Topics of Instruction	2
ANT 7020	Special Dissection	1-3
PN 6300	Medical Cell Biology & Physiology	3
PN 6400	Developmental Neuroscience	3
PN 6550	Neuron-glia Biology and Disease	3
PN 7760	Intercellular Communication	3
BMB 7500	Molecular Biochemistry	3
MI 6200	Neuronal-immune Cross Talk in Homeostasis	3

*Students holding GTA positions are *required* to enroll in Topics of Instruction (ANT 7000) during the semesters in which they teach. For students not holding a GTA position, the requirement to serve as a Teaching Assistant for one semester can be scheduled in any of the semesters of the second year. Therefore, the sequence of courses for the second year will vary according to the teaching assignment.

Certificate Program in Anatomy

Program description.

The Anatomy Certificate Program is a two-semester program that provides graduate level education in three anatomy core courses —, human gross anatomy, human physiology and human neurobiology. It is designed for students who have an interest in anatomy but do not want to pursue, or who do not need, a Master's Degree.

This program is applicable to physical therapists, occupational therapists, physician assistants, athletic trainers, health and physical education majors, and others in allied health disciplines. The intensive coursework requires a full-time commitment.

Note: The Certificate Program in Anatomy is not recommended for students who intend to pursue advanced degrees (e.g., Ph.D., M.D. or the equivalent).

Admission requirements. Applicants for admission are expected to meet the general requirements for admission to the School of Graduate Studies with regular or nondegree status. Although there are no required prerequisite courses, it is recommended that applicants have completed at least one year of biology and two years of chemistry, including organic chemistry.

Program requirements. Students must complete the three core courses with a cumulative grade point average of at least 3.0 to earn a certificate. This program requires successfully completing a minimum of 14 credits hours and total credit hours must not exceed 20. Written permission to enroll in each anatomy course must be obtained from the appropriate course director.

General Descriptions of Anatomy Courses

ANT 6990 Lab Rotation

Special Anatomical problems or research designed for specific needs and talents of the student.

Enrollment Restrictions: Must be enrolled in one of the following Levels: Graduate, Medical, Professional.

Topics vary. *Maximum of 4 credit hours applicable to degree requirements.* Letter graded; 1-4 credit hours. **Staff**

ANT 7000 Topics of Instruction

Topics of Instruction is required of all students who are appointed as an anatomy *Graduate Teaching Assistant* (GTA) (a paid position) and of all students who select the *Course Option* (a non-paid position). *GTA's are required to enroll in Topics of Instruction during the semesters of their employment.* Students either assist in the teaching of the department's undergraduate anatomy and physiology course (ANT 3100 and 3120) or in the teaching of the anatomy graduate core courses. In preparation for this responsibility, students receive instruction on course content and methods of presentation from the course director. Graded pass/fail; 1 credit hour. **Staff**

ANT 7010 Selected Anatomy Topics

A selected area of anatomy is discussed in greater detail than in basic anatomy courses. Some topics may include laboratory.

Enrollment Restrictions: Must be enrolled in one of the following Levels: Graduate, Medical, Professional. Letter graded; 1-4 credit hours. **Staff**

ANT 7020 Special Dissection

An independent study course in advanced anatomical dissection.

This course includes doing special cadaver dissection or prosections for use in the graduate and undergraduate anatomy courses. *May be repeated twice for credit.* Letter graded; 1-3 credit hours. **Staff**

ANT 7110 Human Gross Anatomy

This course consists of three 1-hour lectures and are three 3-hour laboratories per week. The focus and concentration of the course is dissection of the entire human body. Substantial unscheduled time is required to complete the assigned work. Additionally, students are expected to explore human cross sectional and radiographic anatomy using computer-based technology. A team of four students assigned to a single donor typically accomplishes the dissection. Students are required to purchase appropriate textbooks and atlases, laboratory coats or scrubs, and goggles. Lockers are provided for the storage of clothing, books, and other course materials. Letter graded; 6 credit hours.

Barbara Kraszpulska, Ph.D., Course Director

ANT 7150 Advanced Human Embryology

The course addresses the development of the human body, including gametogenesis and early development, as well as development of all major organ systems. A major portion of the course is comprised of descriptive embryology. Mechanisms and clinical relevance of developmental abnormalities are also incorporated into the course. The course is structured for students with a solid background in gross anatomy. The class usually meets 1.5 hours per day, 2 days per week, in a lecture format; there is no laboratory. Letter graded; 3 credit hours.

Michal Kraszpulski, Ph.D., Course Director

ANT 7210 Human Microanatomy

Microanatomy is concerned with the functional morphology of cells, and the histological and ultrastructural survey of the tissues and organs that comprise the human body. The course includes laboratory sessions with the lectures. Students rent a microscope and set of histology slides (\$40 fee) from the school of medicine; a storage locker is provided in the classroom. A

laboratory manual along with an atlas helps guide students through the course content. Classes typically meet 4 days per week for 1-2 hours each day. Letter graded; 3 credit hours.
Bridgett Severt, M.S., Course Director

ANT 7310 Human Neurobiology

The purpose of the course is to introduce the structure and function of the human nervous system. Neuroanatomical and neurophysiological principles are presented within the framework of current research strategies aimed at investigating common clinical neurological disorders. Students are exposed to diverse learning experiences that include neuroscience laboratories and case problem-solving sessions in addition to traditional lectures and research paper based flipped classes. The course usually meets 2 hours per day, 3 days per week. Letter graded; 4 credit hours.

Michal Kraszpulski, Ph.D. & David Ladle, Ph.D., Course Directors

ANT 7900 Anatomy Seminar

Two seminars (Anatomy Seminars I and II) run concurrent with the Department of Neuroscience, Cell Biology and Physiology Seminar Series. The seminars are graded pass/fail based on students' written reports on each seminar. 1 credit hour.

Ashot Kozak, Ph.D., Course Director

ANT 8600 Principles of Biomedical Research

Principles of Biomedical Research is appropriate for students who will be involved in biomedical research. PBR provides the basic principles of biomedical research and covers topics that include the scientific method, productivity, experimental design, critical analysis of manuscripts, and biomedical ethics. Letter graded; 1 credit hour per semester.

Tom Brown, Ph.D., Course Director.

ANT 8990 Graduate Research

Supervised thesis research. Letter graded; 1-14 credit hours. **Staff**

ANT 6030 Biomedical Article Review

The goal in this course is to write a scientific review article that represents independent synthesis of data and conclusions from many original research articles on a topic of the student's choosing. Topics may be along the broad spectrum of neuroscience or physiology, approved after consultation with the instructor. Letter graded; 2 credit hours. **Staff**

ANT 6040 Biomedical Experimental Design

Students will identify a novel hypothesis derived from their studies in ANT 6030. They will design an experimental approach to test their hypothesis and will be able to predict the results that would support their hypothesis. Students will write a paper and give a seminar on the chosen topic. Letter graded; 2 credit hours. **Staff**

Elective Courses

Graduate course work should be selected after consultation with the student's faculty advisor. For, each program option, a minimum of 30 credits of graduate courses is necessary to obtain

the Master's degree. In addition to the required courses and seminars, one or more elective courses are taken in the Department of Neuroscience, Cell Biology and Physiology or in another science department in the College of Science and Mathematics. Courses taken outside the department include, for example, cell biology, pharmacology, and immunology. Courses selected should enhance the student's probability of achieving long-term goals. Listed below are courses commonly selected by anatomy graduate students as elective courses, additionally to those, which were listed in the program description.

Course number	Course title	Credit hours
BIO 7300	Cell Biology	3
M&I 7260	Immunology	4
M&I 7270	Pathogenic Microbiology	4
M&I 7310	Virology	3
M&I 8440	Sem Topics - Microbiology & Immunology	2

Master of Science Degree in Physiology and Neuroscience – Thesis Option

The Master's degree in Physiology and Neuroscience – Thesis Option provides training in research techniques and in the preparation of scholarly papers, and culminates in the preparation and defense of a thesis based on original research. The student's program of study is an initiation into methods of intense study and research in some selected area of physiology, biophysics or neuroscience.

Thesis Option – 30 Credits. The purpose of the Master's degree is to provide the student with a strong research-oriented background in one of several areas of physiology, biophysics or neuroscience. A program of study is designed for each student by the student's faculty advisor and an advisory committee. The second year is devoted almost exclusively to research and culminates in the writing and oral defense of a thesis based upon original research performed while enrolled as a graduate student at the university. The degree requires successfully completing a minimum of 30 credits of graduate-level course work offered by the College of Science and Mathematics and defending a research thesis.

Two years in residence are normally required to complete the Master's degree in Physiology and Neuroscience, although this length of time may vary depending on the background and goals of the student. Below are course options.

	<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
Core Courses (Required)	BMB 7500	Molecular Biochemistry	3
	PN 6100	Human Physiology	4
	PN 7750	Neuroscience and Physiology	3
	PN 8600	Principles of Biomedical Research	1
	PN 7900	Physiology Seminar I	1
	PN 7900	Physiology Seminar II	1
Experiential Component (Required)	P&N 8990	Research	6 (min)
Electives	PN 7760	Intercellular Communication	3
	PN 6300	Medical Cell Biology and Physiology	3
	PN 6400	Developmental Neuroscience	3
	PN 6550	Neuron-Glia Biology and Disease	3
	M&I 6200	Neuronal-immune Cross Talk in Homeostasis	3
	ANT 7210	Human Microanatomy	3
	ANT 7110	Human Gross Anatomy	6
	ANT 7310	Human Neurobiology	4
	ANT 7150	Human Embryology	3
	ANT 7000	Topics of Instruction (for GTAs)	1
	PN 7010	Selected Topics	1-3

Master of Science Degree in Physiology and Neuroscience – Course Option

The Master's degree in Physiology and Neuroscience – Course Option provides training in fundamental concepts in biochemistry, molecular biology, physiology and neuroscience. In addition students take part in the departmental seminar and can choose elective topics relevant to their research or educational needs and career objectives.

Course Option – 30 Credits. The purpose of the Master's degree is to provide the student with a strong theory-oriented background in several areas of physiology, biophysics and neuroscience. The experiential component of the course option is focused on two writing intensive courses. Students will conduct extensive literature-based research and write a review paper on a specialized topic. This review paper will then form the basis of a novel research proposal composed in the Experimental design class. The degree requires successfully completing a minimum of 30 credits of graduate-level course work offered by the College of Science and Mathematics.

Two years in residence are normally required to complete the Master's degree in Physiology and Neuroscience, although this length of time may vary depending on the background and goals of the student. Below are course options.

	<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
Core Courses (Required)	BMB 7500	Molecular Biochemistry	3
	PN 6100	Human Physiology	4
	PN 7750	Neuroscience and Physiology	3
	PN 6300	Medical Cell Biology and Physiology	3
	PN 7900	Physiology Seminar I	1
	PN 7900	Physiology Seminar II	1
Experiential Component (Required)	ANT 6030	Biomedical Review Article	2
	ANT 6040	Biomedical Experimental Design	2
Electives	PN 7760	Intercellular Communication	3
	PN 8600	Principles of Biomedical Research	3
	PN 6400	Developmental Neuroscience	3
	PN 6550	Neuron-Glia Biology and Disease	3
	M&I 6200	Neuronal-immune Cross Talk in Homeostasis	3
	ANT 7210	Human Microanatomy	3
	ANT 7110	Human Gross Anatomy	6
	ANT 7310	Human Neurobiology	4
	ANT 7150	Human Embryology	3
	ANT 7000	Topics of Instruction (for GTAs)	1
	PN 7010	Selected Topics	1-3

Master of Science Degree in Physiology and Neuroscience – 4+1 Thesis Option

The Department of Neuroscience, Cell Biology, and Physiology also offers a combined 4+1 program leading to Bachelor of Science (BS) and Master of Science (MS) degrees over a five year plan of study. The program allows 9 credit hours of overlapping courses, where credit is given at both the undergraduate (UG) and graduate (GR) level facilitating both BS and MS completion in five years.

The Program's coursework focuses on foundational topics related to cellular and systems level physiology and neuroscience. Two different tracks will be available to complete the master's degree requirements, a course option or a thesis option. The thesis option is supplemented with training in fundamental research techniques, as well as opportunities to work with faculty members on cutting-edge research.

Thesis Option – 30 Credits.

The thesis option is for students who need or desire the full range of professional experience, including intensive research and writing. This option assures training in research techniques and in the preparation of scholarly papers. It culminates in the preparation and defense of a thesis based on original research. The student's program of study is an initiation into methods of focused study and research in a selected area of physiology or neuroscience.

Below are required course options.

	<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
Core Courses (Required)	BMB 7500	Molecular Biochemistry	3
	PN 6100	Human Physiology	4
	PN 7750	Neuroscience and Physiology	3
	PN 8600	Principles of Biomedical Research	1
	PN 7900	Physiology Seminar I	1
			1
Experiential Component (Required)	P&N 8990	Research	6 (min)
UG/GR Senior Year (Required)	PN 6200	Neuronal-Immune Cross Talk in Homeostasis	3
	PN 6400	Developmental Neuroscience	3
	PN 6550	Neuron-Glia Biology and Disease	3
Electives (may be taken to achieve 30 credits)	See next page		

Electives	PN 7760	Intercellular Communication	3
	PN 6300	Medical Cell Biology and Physiology	3
	PN 7010	Selected Topics in Physiology	1-3
	ANT 7210	Human Microanatomy	3
	ANT 7110	Human Gross Anatomy	6
	ANT 7310	Human Neurobiology	4
	ANT 7150	Human Embryology	3
	ANT 7000	Topics of Instruction in Anatomy	1

Master of Science Degree in Physiology and Neuroscience – 4+1 Course Option

The Department of Neuroscience, Cell Biology, and Physiology also offers a combined 4+1 program leading to Bachelor of Science (BS) and Master of Science (MS) degrees over a five year plan of study. The program allows 9 credit hours of overlapping courses, where credit is given at both the undergraduate (UG) and graduate (GR) level facilitating both BS and MS completion in five years.

The Program's coursework focuses on foundational topics related to cellular and systems level physiology and neuroscience. Two different tracks will be available to complete the master's degree requirements, a course option or a thesis option.

Course Option – 30 Credits.

The course option allows the student to plan a program of study that, along with the degree requirements, satisfies his or her educational needs and career objectives. This might be to extend knowledge for a current position, or as preparation for one of many health professions. The student's program of study typically culminates with two scientific writing courses broadly in the areas of Physiology and/or Neuroscience.

Below are required course options.

	<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
Core Courses (Required)	BMB 7500	Molecular Biochemistry	3
	PN 6100	Human Physiology	4
	PN 7750	Neuroscience and Physiology	3
	PN 6300	Medical Cell Biology and Physiology	3
	PN 7900	Physiology Seminar I	1
	PN 7900	Physiology Seminar II	1
Experiential Component (Required)	ANT 6030	Biomedical Review Article	2
	ANT 6040	Biomedical Experimental Design	2
UG/GR Senior Year (Required)	PN 6200	Neuronal-Immune Cross Talk in Homeostasis	3
	PN 6400	Developmental Neuroscience	3
	PN 6550	Neuron-Glia Biology and Disease	3
Electives (may be taken to achieve 30 credits)	See next page		

Electives	PN 7760	Intercellular Communication	3
	PN 8600	Principles of Biomedical Research	1
	PN 7010	Selected Topics in Physiology	1-3
	ANT 7210	Human Microanatomy	3
	ANT 7110	Human Gross Anatomy	6
	ANT 7310	Human Neurobiology	4
	ANT 7150	Human Embryology	3
	ANT 7000	Topics of Instruction in Anatomy	1

General Descriptions of Physiology and Neuroscience Courses

PN 6100 Human Physiology

An overview of human/mammalian organ physiology. Fundamental mechanisms and the experimental basis for current understanding are emphasized. Letter graded; 4 credit hours. **Dan Halm, Ph.D., Course Director**

PN 7750 Neuroscience and Physiology

In-depth coverage of cellular neuroscience with an emphasis on physiological concepts. Subjects include nervous system development, generation of ion gradients, ionic basis of the action potential, synaptic transmission, and ion channels. Letter graded; 3 credit hours. **Dan Halm, Ph.D., Course Director**

PN 6300 Medical Cell Biology and Physiology

This is an interdisciplinary course that brings together fundamental concepts of biochemistry, molecular biology, cell biology and cell physiology of eukaryotic cells and applies this knowledge to explaining disease mechanisms. Letter graded; 3 credit hours. **Adrian Corbett PhD., Course Director**

PN 8600 Principles of Biomedical Research

Principles of Biomedical Research is appropriate for students that will be involved in biomedical research. PBR provides a lecture and student interactive series designed to introduce students to the basics of biomedical research. Letter graded; 1 credit hour. **Tom Brown PhD., Course Director**

PN 6400 Developmental Neuroscience

This course will provide an introduction to processes controlling the development of the nervous system. Key topics will include neural differentiation, axon guidance, synapse formation, and circuit refinement. A key focus of the course will be developing critical thinking and data interpretation skills. To facilitate this, students will regularly analyze data from original research papers and class activities will provide opportunities for interpretation and presentation of these findings. Letter graded; 3 credit hours.

David Ladle PhD., Course Director

PN 6550 Neuron-Glia Biology and Disease

The nervous system is comprised of two primary cell types, neurons and glial cells such as microglia, astrocyte, oligodendrocyte, or Schwann cell. The glial cells actively modulate neuronal structures and function, and neurons regulate glial cell behavior. This course focuses on how these cells communicate with each other to perform important tasks in the nervous system. Letter graded; 3 credit hours. **Keiichiro Susuki MD, PhD., Course Director**

PN 7010 Selected Topics in Physiology

A selected area is discussed in greater detail than in basic courses. Some topics may include laboratory. 1 to 3 credit hours per semester. **Staff**

PN 7760 Intercellular Communication

Introduces the concepts of intercellular communication through an interdisciplinary presentation of immune and neuroendocrine system functions. Emphasizes the similarities between the systems and the multidisciplinary approaches used to study each. Letter graded; 4 credit hours. **Adrian Corbett, Ph.D., Course Director**

PN 7900 Physiology Seminar

Two seminars (Physiology Seminars I and II) run concurrent with the Department of Neuroscience, Cell Biology and Physiology Seminar Series. The seminars are graded pass/fail; 1 credit hour.

PN 8990 Physiology Research.

Supervised thesis research. Letter graded; Min 6 credit hours. **Staff**

The Galen Award

The Department of Neuroscience, Cell Biology and Physiology annually gives *The Galen Award* to a student who has achieved the highest combined grade average for the four core graduate anatomy courses.

Galen of Pergamum

AD 129 Pergamum, Mysia, Anatolia (now Bergama, Turkey) – 199, Rome?
byname of Greek CLAUDIOS GALENOS, Latin CLAUDIUS GALENUS

Greek physician who was one of the most distinguished physicians of antiquity – by far, the greatest medical scholar of the Ancient World. Before Galen, the structure and functions of the body were great enigmas to physicians. Galen's influence on medical theory and practice was dominant in Europe throughout the Middle Ages and during the Renaissance. His 22 volumes of written treatises survived as the medical authority until the 16th century, when Andreas Vesalius and, later, William Harvey amended Galen's theories with their discoveries.

Early life and training.

Galen studied Greek natural philosophy, especially Aristotle's works, and he began to specialize in medicine at the early age of seventeen. The city of his birth, site of a shrine of the healing god Asclepius, significantly affected Galen's education. Many of the most distinguished personalities of the Roman Empire visited the shrine for cures. A medical school was attached to the shrine, and there Galen met important men and observed the treatment of a variety of diseases. The high priest maintained a troop of gladiators, which provided Galen with the opportunities to examine wounds and to judge the effects of medical treatment.

Galen continued his studies at several major medical centers of that time, including Smyrna on the west coast of Asia Minor, Corinth in Greece, and Alexandria in Egypt, where he practiced the dissection of animals and broadened his contacts with contemporary physicians. In 157 he returned to Pergamum, where, as chief physician for the gladiators, he increased his practical knowledge of anatomy and tested the best remedies for treating wounds. In 161 the ambitious Galen traveled to Rome, where he received the honor of becoming the personal physician of the emperor Marcus Aurelius. In addition, he was given the responsibility of lecturing and experimenting, which helped to refine his knowledge of anatomy.

Anatomical studies.

Galen based his descriptive anatomy on the dissection of lower animals, particularly the African monkey, often called the Barbary ape. Because this animal is a primate and shares certain characteristics with man, Galen made inferences concerning human anatomy. There is no doubt that he was an accurate observer, particularly of the muscles and bones. He distinguished seven pairs of cranial nerves, described the valves of the heart, and observed the structural differences between veins and arteries. Notable also were his vivisection experiments, such as tying off the recurrent laryngeal nerve to show that the brain controls the voice, performing a series of transections of the spinal cord to study muscle control, and tying off the ureters to demonstrate kidney and bladder functions. One of his most important demonstrations was that the arteries carry blood, not air as had been taught for 400 years.

Although Galen did not discover that the blood circulates, he did achieve a valid and rational interpretation of the observed facts. According to his view, the most important organ in the vascular system was the liver, where blood was formed and the veins originated; blood vessels carried the blood out to the periphery of the body, where, according to him, it was transformed into flesh. He accounted for the large amount of blood in the aorta by suggesting a passage from the right ventricle to the left ventricle of the heart through minute pores in the wall that separates the two. He also suggested that a small amount of blood seeps through the lungs between the pulmonary artery and pulmonary veins, and so from the right to the left ventricle.

Galen believed that human health required an equilibrium between the four humours – phlegm, black bile, yellow bile, and the blood – and that, furthermore, the pneuma (thought to be a material, but a very subtle component carried by the blood) was responsible for guiding many body processes. As a continuation of the earlier Hippocratic conception of the unity of the organism, Galenic physiology became a powerful influence in medicine for the next 1,400 years.

The Sherrington Award

The Department of Neuroscience, Cell Biology and Physiology annually gives *The Sherrington Award* to a student who has excelled academically in the graduate physiology and neuro-science courses and who has demonstrated significant research progress during the first year of study.

Dr. Charles Scott Sherrington
1857-1952

English neurophysiologist whose 50 years of experimentation laid the foundations for an understanding of integrated nervous function in higher animals and brought him the Nobel Prize for Physiology or Medicine in 1932. Dr. Sherrington is considered as one of the Fathers of Neuroscience.

Charles Scott Sherrington was born in London, England. He was educated at Gonville and Caius College, Cambridge; at St. Thomas' Hospital Medical School, where he qualified in medicine in 1885; and at the University of Berlin, where he worked with Rudolf Virchow and Robert Koch. After serving as lecturer at St. Thomas' Hospital, he was successively a professor of physiology at the universities of London, Liverpool, and Oxford. He was made a fellow of the Royal Society in 1893 and served as its president for 5 years. As a physician, he did important work in the study of cholera and of diphtheria and tetanus antitoxins, and played an important role in the improvement of health and safety conditions in British factories during World War I. Sherrington was knighted in 1922 and with Edgar Douglas Adrian shared the 1932 Nobel Prize in Physiology or Medicine "for their discoveries regarding the functions of neurons." Sherrington was also known as a philosopher and poet.

Working with cats, dogs, monkeys, and apes that had been deprived of their cerebral hemispheres, Sherrington found that reflexes must be regarded as integrated activities of the total organism, not as the result of the activities of isolated "reflex arcs," a notion that was currently accepted. The first major piece of evidence supporting "total integration" of muscles, also known as "Sherrington's law of reciprocal innervation:" when one set of muscles is stimulated, muscles opposing the action of the first are simultaneously inhibited.

In his classic work, *The Integrated Action of the Nervous System* (1906), he distinguished three main groups of sense organs: exteroceptive, such as those that detect light, sound, odor, and tactile stimuli; interoceptive, exemplified by taste receptors; and proprioceptive, or those receptors that detect events occurring in the interior of the organism. He found—especially in his study of the maintenance of posture as a reflex activity—that the muscles' proprioceptors and their nerve trunks play an important role in reflex action, maintaining the animal's upright stance against the force of gravity, despite the removal of the cerebrum and the severing of the tactile sensory nerves of the skin.

His investigations of nearly every aspect of mammalian nervous function directly influenced the development of brain surgery and the treatment of such disorders as paralysis and atrophy. Sherrington also coined the terms neuron and synapse to denote the nerve cell and the point at which the nervous impulse is transmitted from one nerve cell to another, respectively.

Open Letters to New Graduate Students

“Congratulations and welcome to Wright State University! You are about to start a very exciting adventure through your first year in the Physiology and Neuroscience Master’s degree program. A year ago I felt the same combination of excitement and wonder, as you are experiencing now. The idea of accomplishing a Masters thesis in the near future seems almost intangible at this point, but just wait and see how the opportunities arise and doors open wide with possibilities. However, reaching that point is completely dependent on your actions and approach to this program. The best advice I can offer you is to be very proactive in both your work and cultivating relationships with our fantastic faculty members—you will be working with one of them soon enough. We are lucky to have a large array of research interests between our faculty, which is good news for you! This makes it much easier to ensure a good match in terms of your thesis topic and work environment. Sure, lab rotation starts in the Spring, but why not reach out and test the water as soon as possible. You are entering the world of research; collaboration, critical thinking, networking and discussion are always welcome. So, put yourself out there, use the most out of every day, and start asking questions! The majority of our classes are team taught by multiple faculty members, each focusing on their specialties and research areas. If you find a topic that catches your interest in one of your classes, dig into the literature, formulate questions and follow up with a faculty member in that research area. My goal for this program is to experience as many research techniques as I can (within reason of course—need to write that thesis too!). This program is a very unique experience that allows you grow—not only in the scientific community—but also as an independent mind. So, use any opportunity you can to expand your repertoire. The best part...you are not in this alone. Don’t forget to reach out to your classmates for help and/or form study groups to solidify concepts and skills. Get excited, give it your best, and enjoy the ride!”

Hanna Gabriel

“Welcome to the Master’s of Anatomy program at Wright State! You’re about to embark on a rigorous yet rewarding journey that will lead you to a complete understanding of human anatomy. Microanatomy and Neuroanatomy will be taught in your first semester. In Microanatomy, Dr. Ream will provide you with an in-depth education as you explore cell biology and the histology of organ systems. Dr. Ladle and Dr. Sonner will teach you the anatomy and the role of different structures and pathways of the nervous system. In your second semester Dr. K will teach Gross Anatomy and Dr. Neider will be your professor in Embryology. In Gross Anatomy you will perform a complete and extremely detailed dissection of a cadaver. Embryology will explain the fate of cells within the embryo during development in the womb. Both classes complement each other; as you learn the fetal development of one system in embryology you will dissect the same structures in gross anatomy. The professors are always welcoming to students who have questions or need explanation of a difficult concept. If you choose the thesis track, your second year will be devoted to conducting research with a professor in the department. I am currently working on my thesis research. I would recommend deciding early on if the thesis track is the route you want to go. This will give you plenty of time to interview professors in the department and find a lab that performs research that interests you. The first year classes can feel overwhelming and daunting at first, but if you stay disciplined and create good study habits you will succeed in the classes. A considerable amount of time must be devoted to learning and reviewing the material presented in the classes. Studying in groups with classmates is a great way to learn the material. Group studying allows you to look at concepts from different points of view and share ideas on how to understand and remember important topics. The 2nd year students will be around to answer any questions you have about the classes or need advice about which track to choose. This program will provide you with the knowledge and background to succeed in a multitude of career paths. Take full advantage of the opportunities presented to you within the next two years and you will achieve your ultimate career goal. I wish you the best of luck in the fall semester as you begin the next step in your academic career.”

Max Jagers

Biomedical Sciences Ph.D. Program

In addition to our own graduate programs, the Department of Neuroscience, Cell Biology and Physiology participates in the training of Ph.D. students who are members of the interdisciplinary Biomedical Sciences (BMS) Ph.D. Program.

The BMS Program is the oldest interdisciplinary program in the health sciences in the state of Ohio. The Program recognizes the interrelatedness of the various traditional disciplines and seeks to provide students with the skills and perspective to investigate biomedical questions that cross defined disciplines. The BMS Program provides an integrated background in biology, chemistry, and mathematics; a mastery of skills at one or more advanced levels of study; and the competence to do independent research. The necessary breadth of basic knowledge is obtained in an interdisciplinary core, which consists of biochemistry and molecular biology, cell biology, cell physiology and biophysics, neuroscience and immunology, and biostatistics. The core curriculum and laboratory rotations occupy the first year and prepare the student to make a knowledgeable decision regarding specialization in succeeding years. The advanced curriculum is organized into areas of concentration that are interdisciplinary in nature. They provide for in-depth study of a particular area within the biomedical sciences.

Faculty from the Department of Neuroscience, Cell Biology and Physiology are major participants in the BMS Program. The Department's goals include maintaining the highest quality in basic biomedical research. This is accomplished using an interdisciplinary approach that includes synaptic development and adaptability, and spinal cord sensorimotor systems; ion channels and membrane transport; molecular and biophysical aspects of cell signaling; intracellular pH regulation; and immunology, virology, and biodefense.

The diversity of the department is reflected in the participation of its faculty in several of the four areas of concentration in the BMS Program, which include Neuroscience and Physiology, Molecular Genetics and Cell Biology, Structural and Quantitative Biology, and Integrated Systems Biology. The BMS Program also participates in two specialized programs: combined M.D./Ph.D. Program and Learning with Disabilities.

For more information, contact:

Dr. David Ladle, Director

2XX Neuroscience and Engineering Collaboration (NEC) Building

Wright State University

3640 Colonel Glenn Highway

Dayton, Ohio 45435

937-775-4692 (NEC office)

937-775-2504 (BMS office)

mill.miller@wright.edu

<http://www.wright.edu/academics/biomed>

THE GRADUATE SCHOOL

Interim Dean of the Graduate School

Barry Milligan, Ph.D.

202A University Hall

775-3336

Grad School: www.linkedin.com/company/wsugraduateschool

GRADUATE CREDIT

Categories of Graduate Credit

Graduate Courses

In order to take graduate courses for graduate credit, students must be officially accepted for admission to the Graduate School. Anatomy courses and Physiology & Neuroscience courses are listed in the course section of this handbook.

Transfer Credit

Upon the recommendation of the student's advisor and the approval of the NCBP Department Program Director and the Graduate School, graduate credit (courses) completed at another regionally accredited academic institution may be transferred to a student's graduate academic record and applied toward the requirements of the student's graduate degree program at Wright State. The graduate credit to be transferred must be within the seven-year term limit for completing a master's degree, and the *amount of credit to be transferred must not exceed 50% of that required by this program*. The transfer of credit request must be approved by the Graduate School.

At least 50% of the hours must be completed at Wright State and must be within the seven-year time limit. All required (other than elective) program course requirements must be completed within the seven-year time limit.

Graduate courses completed at Wright State in nondegree status and later applied toward degree requirements are *not* considered as transfer credit from outside the university.

Graduate Credit Hour Limits

The maximum number of credit hours for which graduate students may register in a quarter is 10. In a summer term of five weeks, six hours is a maximum.

Students holding graduate assistantships must register for a minimum of six-semester hours of graduate credit during each semester they hold appointment.

Students who wish to deviate from the normal registration loads listed above must have the approval of the NCBP Department's Graduate Program Director and the Graduate School.

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The Grading System

Academic achievement is indicated by the following letter grades and points used in calculating grade point averages.

- A** Highest quality/4 points per credit hour
- B** Second quality/3 points per credit hour
- C** Third quality/2 points per credit hour
- D** Lowest quality/1 point per credit hour
- F** Failure/0 points
- X** Failure to complete a course for which registered, without officially withdrawing/0 points (figured as an F in the grade point average)

The following symbols appear on the record, but are *not included in calculating grade point average*.

- L** Audit; given only if arranged for at time of registration.
- N** No report; instructor did not report grade.
- P** Passing; *indicates work of B quality or better* for graduate courses. (Credit is earned but is not computed in grade point averages.)
- U** Unsatisfactory performance; indicates work of C quality or below for graduate courses; given only for specifically approved courses.
- I** Incomplete; given only when part of required work is missing and arrangements have been made with instructor to complete the work. Incomplete grades are reported to the Registrar's Office on the grade report sheet. An incomplete grade agreement between the instructor and the student is not required. The "I" grade may remain on the student's academic record for up to two consecutive terms. The student will have to make up an Incomplete grade by the date the instructor has stipulated or, if no date was stipulated, no later than the last day of classes of the second quarter. Failure to make up an Incomplete grade will result in it being changed to a grade of "F."
- W** Withdrew; given for courses from which the student officially withdrew or dropped during the fourth through fifth weeks of classes or equivalent or for which the student petitioned for withdrawal.

FINANCIAL ASSISTANCE

Graduate Teaching Assistantships

Assistantships are awarded through the Neuroscience, Cell Biology and Physiology Department and require students to spend about 20 hours per week assisting either in instruction, research, or academic support. *Graduate assistants are required by the graduate school to register for a minimum of six hours of graduate credit per semester.* Students who are assisting in instruction are required to enroll in Topics of Instruction (ANT 7000) for each semester they teach. Assistantships are usually awarded to second year students.

For information regarding assistantships, contact the NCBP Department Graduate Program Director.

<https://www.wright.edu/bursar/tuition-fees>

ADMISSION AND REGISTRATION

Admission Categories

Regular Status

The student is admitted as fully qualified to pursue a program leading toward a graduate degree.

Provisional Status

Under certain conditions, a student may be admitted provisionally (*for one term only*), pending receipt of credentials. If admission requirements are not met during the term in which a student was admitted provisionally, registration for future terms will be denied and the student will lose graduate credit for any graduate courses completed during the semester.

Conditional Status

The student who does not meet the admission requirements for regular status, or who has conditions placed on his or her admission by the Department of NCBP, is admitted to the anatomy degree program in this status. Graduate credit earned while in this status will apply toward degree requirements. If all admission requirements are satisfied and the student has completed the first 8 hours of graduate credit, after being admitted into this status, with a 3.0 GPA, regular status will be granted upon approval of the graduate program. A student who does not meet these conditions will be dismissed from the Graduate School.

Nondegree Status

A student who does not plan to work toward a degree, or does not meet the admission requirements of the Graduate School, may be admitted on a nondegree basis in order to take graduate courses. A student cannot receive a degree while in this status. A student in nondegree status must maintain a 3.0 GPA. Furthermore, a student in this status who does not have a 3.0 GPA during the semester in which he or she completes 8 hours of *graduate* course work while in this status will be dismissed. [This option involves admission to the Graduate School, *not* the Department of NCBP. Written permission to enroll in each anatomy course is obtained from the appropriate course director.]

Registration

Students must be admitted to the Graduate School in order to register for and earn graduate credit. The academic year is divided into two semesters (fall and spring) and a summer session. Students should register by the period indicated in the Class Schedule.

Upon completion of the admission requirements and acceptance by the Graduate School, students are authorized to register. Registration must be completed by the date indicated in the Class Schedule.

Students cannot register after the first week of the term without instructor permission. Fees must be paid on or before the date scheduled. No students may be admitted to classes for which they have not been properly registered.

Refer to the sample 'Permission to Register' form on the next page. All anatomy, physiology, and neuroscience courses require the course director's permission to register. Advisor approval is by the Program Director.

Auditing Courses

Graduate students may audit courses with the *approval of the course instructor*. All audits must be clearly indicated on the registration form. Changes from audit to credit or credit to audit cannot be made *after the first week of the term*. The fee per credit hour for auditing a course is the same as for credit courses.

Withdrawal From Courses


Students may drop a course without a grade appearing on their record or withdraw from a course with a "W" appearing on their transcript for the course grade up to specific dates each term. Refer to the Class Schedule for the time periods that are applicable to dropping or withdrawing from a class. Students who stop attending a course and do not make an official withdrawal through WINGS Express or the Office of the Registrar will receive a grade of "F" or "X" at the instructor's discretion. The "X" grade remains on the students' permanent record and is computed in the grade point average as an "F". Non-attendance of the courses or notification to an instructor does not constitute official withdrawal.

Course Repeat

Graduate students may repeat only two courses previously taken for which the *grade received was below a "B"*. Only the hours and grade points earned the second time the course is taken will be included in the computation of the grade point average and the meeting of degree requirements. *Repeats are permitted only twice in any master's degree program.* Graduate students may repeat a repeated course a second time to satisfy completion of a required course. Under these circumstances both courses are averaged into the graduate cumulative grade point average.

Continuing Registration

Note: Each semester prior to registering, make an appointment with the Program Director.



**WRIGHT STATE
UNIVERSITY**

Registration Activity Form – Office of the Registrar

IMPORTANT! Please read instructions below.

PLEASE PRINT

Year _____

Fall ☐

Spring ☐

Summer ☐

Last Name

First Name

M.I.

Student I.D. Number

Phone Number: _____
 WSU Email: _____

☐ Please indicate with an "X" if you are dropping all classes and withdrawing.
☐ Please indicate with an "X" if you do not want to be billed for Student Health Insurance.

Add	Drop	CRN	Dept.	Course Number	Section Number	Credit Hours	Please checkmark all appropriate approvals				Approver Signature	Date
							Instructor	Dept	Pre-Req. Override	Audit*		

* See back of form

Advisor approval: _____

College approval for greater than 20 undergraduate or 18 graduate credit hours: _____

For office use only:

Registration Agreement and Promise to Pay

By signing this agreement with Wright State University, I am requesting to be registered for classes and promise to assume financial responsibility for the payment of all my education-related charges and fees associated with my student account and to pay those charges when due. In the event my account becomes past due, I acknowledge that a registration and transcript hold will be placed on my account and my account may be reported to the credit bureau and referred to the State of Ohio Attorney General's Office for collection. I agree to pay all late fees, collection costs, and attorney fees related to the collection of my account.

Signature _____

Date _____

If faxing this form, you MUST also send a legible photo ID before your request will be processed.

FOR ALL STUDENTS DOING THE THESIS OPTION:

Students must be registered for at least 1 hour of graduate credit as designated by the NCBP department *during the semester in which the successful defense of a thesis is accomplished.*

ACADEMIC POLICIES AND REQUIREMENTS FOR THE MASTER'S DEGREE

Program of Study

A student's program of study is administered by the Neuroscience, Cell Biology and Physiology Department and is subject to approval by the Graduate School. *The program of study is a defined program that is negotiated between a student and an academic department offering a program.* The institution specifically indicates that it will award the degree sought by the student if the work stipulated in the program of study is satisfactorily completed. Similarly, a student specifically agrees to the responsibility for completing the program as stipulated in his or her program of study. Programs of study should be consistent with published curricula and degree requirements.

The program of study will be used by the Graduate School to certify students for graduation. Degree certifications, transfer credit requests, and petitions will not be processed without a completed current and/or amended program of study on file in the student's academic folder in the Graduate School.

Use the sample Program of Study on the next two pages as a guide when completing the form. The form can be obtained from the Program Director; sign and return the completed form to the Program Director.

Credit Hour Requirement

All master's degree programs at the university require completion of 30 or more credit hours of *graduate* course work.

Residence Requirements

A minimum of 50% of the required graduate credit hours toward the master's degree must be completed at Wright State.

Academic Standards

All students in graduate study programs are expected to maintain a minimum grade point average of 3.0. The grade of C is the minimum passing grade for graduate credit. However, *no more than six credit hours of C may be applied toward a master's degree.* The attainment of a large proportion of C grades, even when balanced by A's, can be considered by the faculty as unsatisfactory course work. *A course taken for graduate credit in which a D is received may not be applied toward the requirements of a graduate degree. An average of 3.0 for all graduate course work is required for graduation.*

Student Evaluation

At the end of 8 credit hours of graduate work, the Graduate School will review a student's grade point average. Based on this review, a student who has a cumulative grade point average of less than 3.0 may be placed on probation or dismissed from the Graduate School.

Program of Study

Department of Neuroscience, Cell Biology and Physiology
Wright State University
Dayton, Ohio 45435

XXXX, XXXXX, XXXX

Student's name/Last, first, middle

Degree sought: Master of Science

College of Science and Mathematics

Thesis required

Yes _____ No _____

Anatomy _____ 413

Major _____ Major number

UXXXXXXXXX

Student's UID number

Project required

Yes _____ No _____

Planned Graduate Program

Department name	Course number	Semester hours of credit	Course title	Req.	Elec.	Sem./ Yr.
PN	6100	4	Human Physiology	X		F/
ANT	7310	4	Human Neurobiology	X		F/
ANT	7110	6	Human Gross Anatomy	X		S/
ANT	8000	1	Anatomy Seminar I	X		F/
ANT	8000	1	Anatomy Seminar II	X		S/
			A THESIS OPTION			
ANT	8990		Research	X		F/S
		30				
			A COURSE OPTION			
ANT	6030	2	Biomedical Article Review	X		
ANT	6040	2	Biomedical Experimental Design	X		
			Elective		X	
		30				
			A TEACHER EDUCATION OPTION			
ED	6660	3	Adolescent and Young Adult Science	X		F/
ED	6840	3	Assessment and Measurement	X		F/
ED	6460	1	Field Experience	X		S/
ANT	7550	3	Practicum Literature review	X		
		30				

Acceptance/Signature

Student

Program director

Date

Program of Study

Department of Neuroscience, Cell Biology and Physiology
Wright State University
Dayton, Ohio 45435

XXXX, XXXXX, XXXX
Student's name/Last, first, middle

Degree sought: Master of Science

College of Science and Mathematics

Thesis required
Yes _____ No _____

Physiology & Neuroscience 417
Major Major number

UXXXXXXXXX
Student's UID number

Project required
Yes _____ No _____

Planned Graduate Program

Department name	Course number	Semester hours of credit	Course title	Req.	Elec.	Sem./ Yr.
			THESIS OPTION			
BMB	7500	3	Molecular Biochemistry	X		F/
P&N	6100	4	Human Physiology	X		F/
P&N	8600	1	Principles of Biomedical Research	X		F/
PN	7900	1	Physiology Seminar I	X		F/
PN	6420	3	Neuroscience and Physiology	X		S/
PN	7760	3	Intercellular Communication		X	S/
PN	7900	1	Physiology Seminar II	X		S/
PN	6990	1	Lab Rotation	X		S/
PN	8990		Research	X		
		30				
			COURSE OPTION			
BMB	7500	3	Molecular Biochemistry	X		F/
PN	6100	4	Human Physiology	X		F/
PN	7750	3	Medical Cell Biology and Physiology	X		F/
PN	7900	1	Physiology Seminar I	X		F/
ANT	6030	2	Biomedical Review Article	X		F/
PN	7750	3	Neuroscience and Physiology	X		S/
ANT	6040	2	Biomedical Experimental Design	X		S/
ANT	7900	1	Physiology Seminar 2	X		S/
			Electives		X	
		30				

Acceptance/Signature

Student _____

Program director _____

Date _____

Probation

A student placed on probation will be required to change this status by achieving a cumulative grade point average of 3.0 within the completion of the next 8-semester hours of credit work. Failure to achieve the 3.0 grade point average will result in the student's dismissal from the Graduate School. If a portion of these credits is in research for the thesis requirement, the NCBP Department must certify the student's eligibility to continue studies at the university.

Thesis

The Anatomy Master's Thesis Option and the Physiology and Neuroscience Master's Thesis Option specify the presentation of a thesis as a requirement for the master's degree. Students completing this requirement should secure a copy of the Graduate Thesis/Dissertation Handbook, published by the Graduate School and available in the graduate office. The requirements outlined in this manual are basic minimal criteria that have been approved by the Graduate Council for preparing the thesis. Students should seek the advice of their thesis supervisors and departments for further details. Students are encouraged, but not required, to obtain a format check prior to the final deposit of the thesis. This format check significantly reduces the likelihood of a last-minute rejection.

One (1) electronic copy of the thesis, in portable document format (pdf), must be deposited with OhioLINK not later than 30 days after the end of the semester in which the degree will be granted (due dates are published by the Graduate School). The electronic thesis and dissertation is called an ETD. OhioLINK, in Columbus, is the repository for ETD's for the state university system in Ohio.

Students may seek assistance in preparing and setting up their ETD files either from the Graduate School (E344 Student Union) or at the Student Technical Assistance Center (STAC) in 240 Paul Laurence Dunbar Library. The ETD submitted to OhioLINK must be carefully produced and free of errors in style, mechanics, and format; therefore, a format check by the Graduate School in advance of submitting the final ETD is strongly recommended. The student should submit the ETD file as an email attachment to etd@wright.edu or on a CD to the Graduate School for the format check.

Once the format has been checked and all additions and corrections made, the student may submit the final ETD directly to OhioLINK at <http://etd.ohiolink.edu/submit/> or through the Graduate School, either as an e-mail attachment or on CD-Rom, for transmittal to OhioLINK. The ETD is e-mailed as an attachment to OhioLINK, or it can be submitted to the Graduate School either as an e-mail attachment to etd@wright.edu or on a CD. When a Wright State ETD has been received, OhioLINK notifies the Graduate School of receipt by e-mail. The ETD is not placed online at OhioLINK until the Graduate School has approved it for release.

The department program office would like to have one paper or electronic copy of the completed and approved thesis. Students are responsible for paying binding fees for their own personal copies.

One original paper copy of the signed approval page must be submitted to the Graduate School before the student's ETD can be approved. The signed approval page is kept on file in the Graduate School. The ETD will be submitted to OhioLINK, either by the student or the Graduate School, with the approval page containing the typed names of the faculty, but with no signatures. The signature of the department chair on the original approval page of the thesis verifies only that the student has successfully passed the oral defense and that the format is acceptable to the department. The Dean of the Graduate School must approve the final copy.

Time Limit

A student must complete all requirements for a master's degree within seven years.

Graduate students who fail to take courses or otherwise to pursue their graduate education for a period of one calendar year will automatically be retired from the active files of the Graduate School. Reapplication for admission will be required to reactivate the student's records.

Fresh Start

Graduate students may request a "fresh start" when changing or returning to graduate programs within the Graduate School. A "fresh start" is defined as beginning a graduate program and having the graduate academic record recalculated to reflect no hours attempted and no graduate grade point average for the new program. A "new program," for fresh start purposes, is defined as a program into which a student transfers while in active status or a program to which a student returns from inactive status. All courses previously taken (and grades earned) at Wright State will remain on the student's academic record.

Course work completed in a previous Wright State program or other institutions' graduate programs will *not* be automatically transferred or applied to the requirements of the new program. The new graduate program may, however, recommend to the Graduate School which courses previously taken are acceptable for transfer into the new program.

A student granted a fresh start will be admitted into the new program as a *conditional* degree-seeking student. The new program must be completed within a minimum of 30 semester hours of graduate credit. The seven-year rule for completing the program requirements starts with the quarter in which the student first registers for courses required for the new program. *Only one fresh start will be granted to a student.*

Graduation

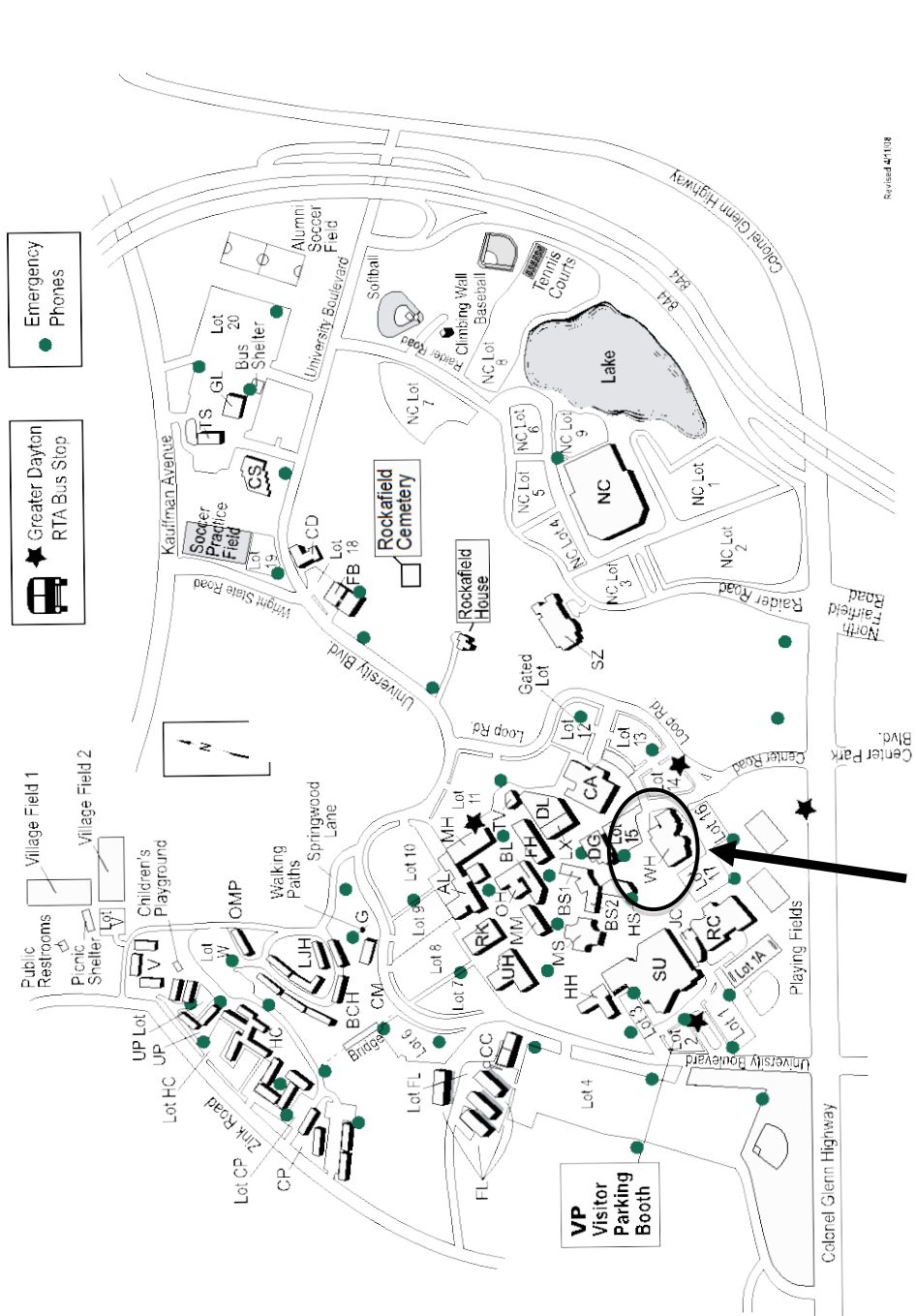
The following is a summary of the requirements for a Master's Degree.

1. Completed Program of Study on file in the Graduate School.
2. Completion of the requirements for the graduate degree within seven calendar years.
3. Achievement of a cumulative grade point/hour ratio of at least 3.0 in all courses taken for graduate credit (no more than nine hours of C are acceptable).
4. Successful completion of an approved thesis (if required).
5. Presentation of an approved thesis (if required).
6. Registration during the quarter in which the thesis is defended.
7. Successful completion of the final comprehensive examination (if required).
8. Presentation of an approved scholarly project (if required).
9. Completion of a minimum of 30 credit hours of program required graduate credit. At least 50% of the graduate credit must have been completed at Wright State.

MAP OF THE WRIGHT STATE UNIVERSITY CAMPUS

Buildings

AL Allyn Hall	DG Diggs Laboratory	LJH Laurel/Jacob/Hickory Library Annex	SU Student Union
BS1 Biological Sciences I	DL Durrer Library, Paul Laurence Fawcett Hall	LX Library Annex	SZ Seizer Pavilion/Mills-Morgan Center
BS2 Biological Sciences II	FH Fine Arts Building	MM Mathematical and Microbiological Sciences	TV Television Center
BCH Boston/Cedar/Hawthorn	FB Forest Lane Apartments	MS Medical Sciences	TS Transportation Services Center
BL Brenm Laboratory	FL Garden for the Senses	MH Millet Hall	UH University Hall
CC Community Center	GL Geology Field Equipment Base	NC Nutter Center, Ervin J.	UP University Park Apartments
CM Campus Ministry Center	HH Hamilton Hall	OMP Oak/Maple/Pine	V The Village Apartments
CS Campus Services Building	HC Honors Community	OH Gelman Hall	VP Visitor Parking Booth
CD Child Development Center	HS Health Sciences	RK Rike Hall	WH White Hall (Boonshoft School of Medicine)
CP College Park Apartments	JC Joshi Research Center	RC Russ Engineering Center, Fritz and Dolores	
CA Creative Arts Center			



Revised 4/1/08