

# ANATOMICAL SCIENCES AND NEUROBIOLOGY (ASNB)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes ([https://csprd.louisville.edu/psp/ps\\_class/EMPLOYEE/PSFT\\_CS/c/COMMUNITY\\_ACCESS.CLASS\\_SEARCH./x/?state=62dab551a0d600a5e8237359c50704e59007&duo\\_code=sjUx20STj210W5e087bRk1f0p6V](https://csprd.louisville.edu/psp/ps_class/EMPLOYEE/PSFT_CS/c/COMMUNITY_ACCESS.CLASS_SEARCH./x/?state=62dab551a0d600a5e8237359c50704e59007&duo_code=sjUx20STj210W5e087bRk1f0p6V))

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

## Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (<https://louisville.edu/bursar/tuitionfee/university-fees/>).

### ASNB 502. Fundamentals of Neuroscience 3 Units

**Term Typically Offered:** Fall Only

**Prerequisite(s):** PSYC 355 or permission of instructor.

**Description:** Basics of cellular and systems neuroscience are taught through a combination of lectures and laboratories. Topics include: electrical potentials in the nervous system, synaptic transmission, somatosensory pathways, special senses (vision, hearing, balance, taste, and smell), eye movements, motor systems and higher functions (language, sleep and wakefulness, cognition, emotion and memory).

**Note:** Credit may not be earned in both ASNB 502 and ASNB 602.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

### ASNB 514. Molecular Neuroscience - CUE 3 Units

**Term Typically Offered:** Fall Odd Years

**Description:** Prerequisites or corequisites: ASNB 502, BIOL 241, BIOL 329, BIOL 415, Instructor Permission The purpose of this course in Molecular Neuroscience is to explore the molecular and cellular basis of nervous system development, function and diseases. The course will provide intellectual tools and skills to evaluate novel hypotheses and mechanisms in neuroscience. Special emphasis of the course will be to provide basic technical knowledge and tools to apply molecular biology concepts in the ongoing research in any area of neuroscience.

**Course Attribute(s):** CUE - This course fulfills the Culminating Undergraduate Experience (CUE) requirement for certain degree programs. CUE courses are advanced-level courses intended for majors with at least 90 earned credits/senior-level status.

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### ASNB 517. Seminar on Developmental Neurobiology - CUE 3 Units

**Term Typically Offered:** Spring Even Years

**Prerequisite(s):** ASNB 502, and BIOL 329 or ASNB 514.

**Description:** The purpose of this course is to provide the student with a basic understanding of the processes and mechanisms of neural development. Specific topics include emergence of the neural primordium, patterning and growth of the nervous system, neuronal determination, axonal navigation and targeting, neuron survival and death, synapse formation, synaptic refinement and the formation of specific connections.

**Course Attribute(s):** CUE - This course fulfills the Culminating Undergraduate Experience (CUE) requirement for certain degree programs. CUE courses are advanced-level courses intended for majors with at least 90 earned credits/senior-level status.

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### ASNB 530. Origin of Mammalian Sensory Systems and Comparative Neurobiology - CUE 3 Units

**Term Typically Offered:** Fall Even Years

**Prerequisite(s):** PSYC 305, or permission of instructor.

**Description:** This course examines the phylogenetic and developmental history of the mammalian senses with a focus on the integration of anatomy, neurobiology, and fossil evidence. We will study how our understanding of non-human vertebrates (both model and non-model organisms) can provide important insights into the structure and function of the modern mammalian senses and their brain correlates.

**Course Attribute(s):** CUE - This course fulfills the Culminating Undergraduate Experience (CUE) requirement for certain degree programs. CUE courses are advanced-level courses intended for majors with at least 90 earned credits/senior-level status.

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### ASNB 566. Synaptic Organization of the Central Nervous System - CUE 3 Units

**Term Typically Offered:** Spring Odd Years

**Prerequisite(s):** ASNB 502.

**Description:** The purpose of this course is to provide the student with a basic understanding of synaptic circuits and the techniques used to study them. Each week we will focus on a different brain region or circuit. During the first meeting of each week the instructor will provide an overview of the topic which includes both lecture and reading material. During the second meeting of each week, students will meet with a graduate student teaching assistant to review and discuss the course material presented that week.

**Course Attribute(s):** CUE - This course fulfills the Culminating Undergraduate Experience (CUE) requirement for certain degree programs. CUE courses are advanced-level courses intended for majors with at least 90 earned credits/senior-level status.

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- ASNB 601. Gross Anatomy** **6.5 Units**  
**Prerequisite(s):** Permission from course director at least two weeks before beginning of course.  
**Description:** Primarily a laboratory course. Major emphasis is upon cadaver dissection, but lectures, group discussions, informal laboratory conferences, demonstrations, X-ray presentations are frequent. Correlation of function with structure is stressed in all areas. See Medical School Freshman Schedule for time.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 602. Fundamentals of Neuroscience** **4 Units**  
**Description:** Basics of cellular and systems neuroscience are taught through a combination of lectures, laboratories, and independent study. Lectures concurrent with ASNB 502; one added lecture hour each week covers advanced topics through recent article readings and discussion. Topics covered include: electrical potentials in the nervous system, synaptic transmission, somatosensory pathways, special senses (vision, hearing, balance, taste, and smell), eye movements, motor systems, and higher functions (language, sleep and wakefulness, cognition, emotion and memory).  
**Note:** Credit may not be earned for both ASNB 502 and ASNB 602.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 605. Human Embryology** **3 Units**  
**Prerequisite(s):** Permission from course director at least two weeks before beginning of course.  
**Description:** The 2012 embryology course is trying to emphasize the clinical aspect of embryology and to allow students to better understand the importance of this particular pre-clinical subject in their medical education. The embryology material is divided into 7 modules, organized by anatomical systems. Although embryology course runs over 8 weeks period, as much as possible, we tried to match your embryology material with the gross anatomy and histology. Modules contain: descriptive developmental embryology lectures, clinical lectures.  
**Note:** Cross-listed with IDEP 865.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 606. Anatomy Seminar** **1 Unit**  
**Prerequisite(s):** ASNB 602 as a pre-requisite or a co-requisite and restricted to Anatomical Sciences and Neurobiology graduate students.  
**Description:** Presentations and discussions of individual research or topics of current anatomical interest throughout the year.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 608. Neural Systems** **4 Units**  
**Prerequisite(s):** ASNB 607 or consent of course director at least 2 weeks before course begins.  
**Description:** Topics covered include: electrical potentials in the nervous system, synaptic transmission, somatosensory pathways, special senses (vision, hearing, balance, taste, smell), eye movements, motor systems, higher functions (language, sleep and wakefulness, learning and memory). Emphasis is placed on clinical relevance.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 609. Fundamentals of Neuroscience Discussion** **1 Unit**  
**Term Typically Offered:** Fall Only  
**Prerequisite(s):** ASNB 502.  
**Description:** The goal is for students to gain a better understanding of techniques used to study the nervous system. Select topic areas will be taught using an interactive approach that enables students to process course material through thinking, talking, writing, and/or problem solving.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 610. Neuroscience Methods** **1-2 Units**  
**Grading Basis:** Pass/Fail  
**Prerequisite(s):** ASNB 502 or ASNB 602, or consent of the Course Director.  
**Description:** The primary goal of the Methods course is to provide graduate students with the framework to become familiar with key tools and techniques used in neuroscience research. One method will be learned per credit hour in a laboratory of the students choosing. By the end of the semester, each student will generate a written step-by-step protocol of the technique learned along with a two page description (double-spaced) of the method and its use.  
**Note:** Cross-listed with BIOC 610, MBIO 610, PHTX 610, and PHXB 610.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 614. Molecular Neuroscience** **4 Units**  
**Prerequisite(s):** Consent of instructor.  
**Description:** Structure and function of the nervous system from a molecular perspective. Includes description of membrane proteins, channels and receptors in neurons and glia. Discussion of the role of such molecular structures in the nervous system.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)
- ASNB 616. Special Projects in Anatomy** **1-15 Units**  
**Prerequisite(s):** Permission from instructor at least two weeks before beginning of course.  
**Description:** This course, to be arranged to fit individual needs, is intended primarily to accommodate students with special backgrounds in anatomy; it may also be offered for others who have special needs for other advanced training. May be offered each quarter. Schedule to be arranged.  
For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

<p><b>ASNB 617. Seminar on Developmental Neurobiology</b> <span style="float: right;"><b>3 Units</b></span>  <b>Prerequisite(s):</b> Consent of instructor.  <b>Description:</b> Covers neural development from neurulation through development of integrated systems. Emphasis will be on the cellular level.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	<p><b>ASNB 630. Origin of Mammalian Sensory Systems and Comparative Neurobiology</b> <span style="float: right;"><b>4 Units</b></span>  <b>Term Typically Offered:</b> Fall Even Years  <b>Prerequisite(s):</b> ASNB 502 or ASNB 602 or permission of instructor.  <b>Description:</b> This course examines the phylogenetic and developmental history of the mammalian senses with a focus on the integration of anatomy, neurobiology, and fossil evidence. We will study how our understanding of non-human vertebrates (both model and non-model organisms) can provide important insights into the structure and function of the modern mammalian senses and their brain correlates.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>
<p><b>ASNB 618. Laboratory Rotation</b> <span style="float: right;"><b>1-3 Units</b></span>  <b>Grading Basis:</b> Pass/Fail  <b>Prerequisite(s):</b> Consent of instructor.  <b>Description:</b> This course will expose new graduate students to the research conducted in laboratories of the faculty of the Department of Anatomical Sciences Neurobiology. The objectives of the laboratory rotations are to expose doctoral students to different approaches and areas of research, and to assist the student in choosing a laboratory for dissertation research.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	<p><b>ASNB 666. Synaptic Organization of the Central Nervous System</b> <span style="float: right;"><b>3 Units</b></span>  <b>Description:</b> An overview of the synaptic organization of the central nervous system will be covered through lectures and discussion of seminal systems neuroscience journal articles.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>
<p><b>ASNB 619. Original Investigations</b> <span style="float: right;"><b>1-15 Units</b></span>                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	<p><b>ASNB 671. General and Oral Histology</b> <span style="float: right;"><b>5 Units</b></span>  <b>Prerequisite(s):</b> Oral Biology major or related field.  <b>Description:</b> Provides knowledge of histological structure including ultrastructure of tissues and organs. Oral structures presented in detail.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>
<p><b>ASNB 620. Thesis</b> <span style="float: right;"><b>1-6 Units</b></span>                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	<p><b>ASNB 672. Integrated Biomedical Sciences II</b> <span style="float: right;"><b>11 Units</b></span>  <b>Term Typically Offered:</b> Spring Only  <b>Prerequisite(s):</b> Enrollment in the School of Dentistry, Oral Biology major or related field or consent of course director.  <b>Description:</b> This course is designed specifically for first-year dental students. The primary goal of the course is to introduce clinically-oriented principles of the gastro-intestinal (GI) tract, head, and neck regions integrating gross anatomy, neuroanatomy, histology, physiology, biochemistry, and embryology. The course is also designed to foster critical thinking skills necessary for students to utilize their knowledge of these regions to evaluate the health of patients and to solve clinical problems. Anatomical donor prosection is the focal point of all teaching activities, allowing students to develop a three-dimensional/functional appreciation for the relationships of the various structures of these regions.  <b>Note:</b> Cross-listed with BMSC 809.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>
<p><b>ASNB 621. Introduction to Scientific Computing</b> <span style="float: right;"><b>2 Units</b></span>  <b>Grading Basis:</b> Pass/Fail  <b>Term Typically Offered:</b> Summer Only  <b>Description:</b> The goal of this course is to provide the student with a sufficient understanding of the MATLAB work environment for scientific computing to begin to use MATLAB for their own research purposes. The course covers syntax, data import/export, data visualization, data analysis process design, and data organization and management.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	<p><b>ASNB 675. Advanced Head and Neck Anatomy</b> <span style="float: right;"><b>2 Units</b></span>  <b>Prerequisite(s):</b> One of the following: 1) Admission to the MS Oral Biology program; 2) a DDS, DMD, MD, or DO degree or its foreign equivalent; 3) consent of the course director.  <b>Description:</b> Advanced topics in the anatomic relations of the head and neck as applicable to the post-graduate health professional, with major emphasis on cadaver dissection.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>
<p><b>ASNB 622. Analytics in Biomedical Science</b> <span style="float: right;"><b>3 Units</b></span>  <b>Term Typically Offered:</b> Fall Only  <b>Prerequisite(s):</b> Course is restricted to students enrolled in an IPIBS Program (ASNB, BIOC, MBIOPHTX, PHZB) or IPTN.  <b>Description:</b> Others require instructor permission The purpose of this course of Analytics in biomedical science is to explore quantitative methods used in biomedical science research. A heavy emphasis will be placed on learning descriptive and inferential analytics along with available tools (software) that can be used to this end. Towards the end, there will also be an introduction to large observational studies and predictive analytics. Also, storytelling with data will be briefly explored along with academic writing. Mastery will be evaluated through assignments, exams, and most importantly a project which will be presented at the end of the course.                      For class offerings for a specific term, refer to the Schedule of Classes (<a href="http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm">http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm</a>)</p>	

**ASNB 677. Current Topics in Sensory Systems Research 1 Unit**

**Grading Basis:** Pass/Fail

**Prerequisite(s):** Consent of course director at least 2 weeks before course begins.

**Description:** Recent research directed toward understanding the organization and function of the auditory, gustatory, olfactory, somatosensory, and visual systems will be presented and critiqued.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)