Neuroscience

NSC 3344 Anatomy and Physiology of Speech and Hearing (3 semester credit hours) Study of anatomic and physiologic mechanisms underlying speech: respiration, phonation, and articulation. Overview of the peripheral auditory system, neuroanatomy, and normal swallowing. (Same as SPAU 3344) (3-0) Y

NSC 3345 Neural Basis of Communication (3 semester credit hours) Organization and function of cortical and subcortical structures that underlie speech, language and hearing. Special consideration of structures and pathways typically affected in neurogenic disorders of communication. (Same as SPAU 3345) (3-0) Y

NSC 3361 Introduction to Neuroscience (3 semester credit hours) Introductory course that explores the nature of the brain processes underlying behavior, including consideration of basic neurophysiology and the physiology of sensation, learning, and emotion. (3-0) S

NSC 4350 Medical Neuropathology (3 semester credit hours) Medical school format course on the major topics of neurology (coma, stroke, dementia, muscle diseases, etc) with discussion of neurologic symptoms, signs and diseases and their diagnosis, evaluation, and treatment. Patient vignettes form much of teaching and relevant neuroanatomy and neurophysiology will be reviewed as needed. Prerequisites: NSC 3361 and NSC 4366. (3-0) Y

NSC 4351 Medical Neuroscience (3 semester credit hours) Discussions of major topics in the medical neurosciences (including coma, stroke, dementia, muscle diseases, etc.) with discussion of neurologic symptoms, signs, and diseases. Coverage of their diagnosis, evaluation, and treatment for students considering advanced medical training. Prerequisite: NSC 3361. (0-3) Y

NSC 4352 Cellular Neuroscience (3 semester credit hours) The cell biology and cellular physiology of the neuron. Growth and maintenance of dendrites, axons and synapses, and the underlying processes of macromolecule synthesis, packaging, and transport are the central biological issues. Electrical signaling, ion channel functions, and synaptic transmission are covered. Prerequisites: NSC 3361 and CHEM 1311 and CHEM 1312. Prerequisite or Corequisite: BIOL 2311. (3-0) Y

NSC 4353 Neuroscience Laboratory Methods (3 semester credit hours) This laboratory course provides hands-on experience with the use of electrophysiological techniques for the analysis of living neural preparations. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311 and (MATH 2413 or MATH 2417). (0-3) S

NSC 4354 Integrative Neuroscience (3 semester credit hours) Examines the collective behavior of neuronal systems with respect to sensory processing, motor control, and the plasticity regulating more advanced behavioral, motivational, and cognitive functions. Prerequisite: NSC 3361. (3-0) Y

NSC 4355 Advanced Neuroscience Laboratory (3 semester credit hours) This laboratory course exposes students to a structured research project, with topics selected in consultation with the

instructor. It requires students to develop a rationale for experiments and to interpret their results. Each student writes a publication-style paper with reference to the scientific literature. Prerequisite: NSC 4353. (0-3) R

NSC 4356 Neurophysiology (3 semester credit hours) This course focuses on the elements of neural functions ranging from the kinetics of channels in excitable membranes to the collective behavior of real neural networks. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311 and (MATH 2413 or MATH 2417). (3-0) Y

NSC 4357 Neurobiology of Learning and Memory (3 semester credit hours) Current research and theory on modifications in the nervous system that may underlie memory. Includes overviews of synaptic physiology and behavioral pharmacology, and concepts of neural plasticity revealed from research findings. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311. (3-0) T

NSC 4358 Neuroscience of Pain (3 semester credit hours) A review of the anatomical and physiologic basis for different forms of pain, with an emphasis on similarities and differences between different forms of pain. Basic neural processing of pain signals in the dorsal horn of the spinal cord and the brain, including the anatomy and function of the ascending and the descending systems are covered. Prerequisite: NSC 3361. (3-0) T

NSC 4359 Cognitive Neuroscience (3 semester credit hours) Examines how modern cognitive neuroscientists explore the neural underpinnings of perception, memory, attention, language and emotion. Investigates how the brain-bases of these functions are uncovered by ingenious observations of clinical populations (including brain-damaged and schizophrenic patients), animal and human electrophysiological techniques, and powerful new functional neuroimaging tools. Prerequisite: PSY 2301. (Same as CGS 4359 and PSY 4359) (3-0) S

NSC 4362 Molecular Neuroscience (3 semester credit hours) Examines the regulation and expression of major macromolecules of neurons and glia, including DNA, RNA, and proteins. Interdependence of major pathways, and the effects of development and experience on molecular mechanisms will be explored. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311. (3-0) T

NSC 4363 Neuropharmacology (3 semester credit hours) A survey of neurotransmitter functions with special emphasis on effects in the central nervous system. Emphases on ion channels and receptors, and on neurotransmitter metabolism, transport and release. Mechanisms of action from the subcellular to whole organism level are discussed. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311 and (MATH 2413 or MATH 2417). (3-0) Y

NSC 4364 Journey into Medicine (3 semester credit hours) For those students considering or committed to a career in medicine, this course will help in understanding exactly what life will be like during medical school and beyond for you. Considers personal, financial, spiritual, social and legal aspects of training and working as a physician. Prerequisite: NSC 3361. (3-0) T

NSC 4365 Laboratory Methods in Human Neuroscience (3 semester credit hours) This laboratory

course provides hands-on experience with the use of electrophysiological techniques for testing hypotheses and collecting and analyzing cognitive neuroscience data. Prerequisites: NSC 3361 and (NSC 4352 or NSC 4356). (0-3) R

NSC 4366 Neuroanatomy (3 semester credit hours) Introduction to the anatomical organization and basic functional principles of the major sensory, motor, associational, and modulatory systems of the human brain. Students learn to identify visually specific structures on slides, magnetic resonance images (MRI), and dissected brain specimens in relation to neural pathways and system interconnections. This course provides a basis for a general understanding of the human brain and its functions in relation to disease and behavior. Prerequisites: NSC 3361 and CHEM 1311 and BIOL 2311. (3-0) Y

NSC 4367 Developmental Neurobiology (3 semester credit hours) Examines the processes guiding the proliferation, differentiation, and migration of neurons as they form transient or long-lasting connections and circuits. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311. (3-0) T

NSC 4370 Neuroendocrinology (3 semester credit hours) A detailed examination of central nervous system regulation of the endocrine system, primarily via the hypothalamic-pituitary-adrenal axis. Examines feedback effects of hormonal actions on neuronal function. Prerequisite: NSC 4366. (3-0) T

NSC 4371 Neural Plasticity (3 semester credit hours) Review of the basic principles of neural plasticity. Special emphasis on cortical or subcortical plasticity related to development, recovery from injury and adaptations to the external world involved in learning and memory. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311. (3-0) T

NSC 4372 Neuroimmunology (3 semester credit hours) Studies of the effects of the brain and the mind on the immune system, and subsequent effects on health and disease. Immune effects on neural and endocrine actions are also considered. Prerequisite: NSC 3361. (3-0) T

NSC 4373 Sensory Neuroscience (3 semester credit hours) Review of the basic principles of neural information processing, with emphasis on the central nervous system processes underlying one or more sensory modalities. Readings and discussion of classic and modern primary papers. Prerequisite: NSC 3361. (3-0) T

NSC 4374 Neuroplasticity in Disorders of the Nervous System (3 semester credit hours) The symptoms and signs of multiple disorders caused by reorganization or plasticity of the central nervous system. A review of the neural plasticity underlying the pathophysiology of disorders such as chronic pain, tinnitus, balance disorders, spasticity, etc., i.e. a "dark side" of plasticity not widely recognized. Prerequisite: NSC 4352. (3-0) T

NSC 4376 Neurobiology of Stress (3 semester credit hours) Studies of the effects of stressors (specific and nonspecific) on bodily systems, with respect to health and disease and maintenance of homeostatic equilibria. Neural, endocrine, and immune interactions will be assessed. Prerequisite: NSC 4354. (3-0) T

NSC 4378 Neurotoxicology (3 semester credit hours) An overview of modern toxicology as it affects the nervous system. Adverse effects of xenobiotics and neurotoxins, hypo or hyperactivation of neuromodulatory and hormonal systems. Prerequisite: NSC 4352 or NSC 4363. (3-0) T

NSC 4383 Human Neurophysiology Lab (3 semester credit hours) This laboratory course provides hands-on experience with the use of electrophysiological techniques for the theory, collection, and analysis of neuroscience data. Students will gain hands-on experience learning professional data analysis techniques for human electrophysiology using applications of EEG and ERP software, and will cover critical elements of experimental design neuroscience. Prerequisites: NSC 3361 and NSC 4352 and CHEM 1311 and CHEM 1312 and BIOL 2311 and (MATH 2413 or MATH 2417). (1-2) Y

NSC 4385 Neuropsychology (3 semester credit hours) This course is a comprehensive introduction of the relationship between brain and behavior. Topics include the foundations of neuropsychology, the brain's organization and functional systems, and neuropsychological perspectives of memory, attention, language, emotion, and spatial functions, and their related disorders. Prerequisite: NSC 3361. (Same as CGS 4385 and PSY 4385) (3-0) Y

NSC 4387 Neuropathology (3 semester credit hours) This course studies diseases of nervous system tissue, examining surgical biopsies or whole autopsy brains to discover what can go wrong with the human brain. Neuropathology is a subspecialty of anatomic pathology, neurology, and neurosurgery, examining human clinical cases. Prerequisites: NSC 3361 and NSC 4366. (3-0) T

NSC 4388 Medical Physiology (3 semester credit hours) This course is designed to improve understanding of the basic sciences of human physiology: how body systems work to maintain homeostasis, and how alterations in homeostasis are associated with disease. Covers how the nervous system functions with and regulates other physiological systems of the body. Prerequisites: NSC 3361 and NSC 4352. (3-0) T

NSC 4389 Developmental Cognitive Neuroscience (3 semester credit hours) Course examines how the human brain develops and changes throughout childhood to support a range of essential cognitive processes. The course will include the following topics: the development of the neuronal structures underlying imperative cognitive processes including: vision, attention, social cognitive, memory, language, and planning; how genetic and environmental factors interact to shape brain networks underlying human behavior; methods for studying cognitive neuroscience across the lifespan, including fMRI, EEG, rTMS, and DTI; and neuroplasitcity and the changing brain throughout development. Prerequisite: PSY 2301. (Same as CLDP 4389 and CGS 4389 and PSY 4389) (3-0) Y

NSC 4394 Internship in Neuroscience (3 semester credit hours) Students earn course credit for field experience in an applied setting. Requires working at least 8 hours per week at an approved community agency or business of the student's choice. Students keep daily job diaries, attend one class meeting per month, and write brief papers relevant to their experiences. Open to students in good academic standing with a GPA of at least 2.500 who have reached junior or senior standing (more than 53 hours). Apply for placements on the BBS website. Credit/No Credit only. Instructor consent required. (Same as CGS 4394 and CLDP 4394 and PSY 4394 and SPAU 4396) (3-0) S

NSC 4397 Thesis Research (3 semester credit hours) An independent study in which the student writes a thesis under faculty supervision. Instructor and Associate Dean consent required. (3-0) S

NSC 4V75 Honors Seminar (1-3 semester credit hours) A course for students enrolled in the BBS Honors Program (minimum 3.500 GPA and 30 graded hours at UT Dallas) who will conduct undergraduate thesis research in BBS. The seminar addresses issues related to research activities. This course is required for students seeking BBS School Honors. Offered only in spring semester. Credit cannot be received for more than one of the following: CGS 4V75, CLDP 4V75, NSC 4V75, PSY 4V75 or SPAU 4V75. Director of the Honors Program consent required. ([1-3]-0) Y

NSC 4V90 Special Topics in Neuroscience (1-3 semester credit hours) May be repeated for credit as topics vary (9 semester credit hours maximum). ([1-3]-0) R

NSC 4V91 Green Fellowship Directed Research (1-12 semester credit hours) Student assists faculty with research projects or conducts a research project under weekly faculty supervision. Enrollment is limited to students selected for the Green Fellowship program. Instructor and Associate Dean consent required. ([1-12]-0) Y

NSC 4V95 Externship in Neuroscience (1-3 semester credit hours) Students earn course credit for directed research performed at approved laboratories at UT Southwestern or other local neuroscience centers. Credit/No Credit only. May be repeated for credit (9 semester credit hours maximum). UT Dallas NSC faculty consent required. ([1-3]-0) R

NSC 4V96 Teaching Internship (1-3 semester credit hours) Students work individually with faculty member in preparing and presenting course materials and tutoring students. Must have completed the relevant course with a grade of at least B and have a UT Dallas GPA of at least 3.000. Credit/No Credit only. May be repeated for credit (6 semester credit hours maximum). Instructor and Associate Dean consent required. ([1-3]-0) S

NSC 4V98 Directed Research (1-3 semester credit hours) Student assists faculty with research projects or conducts a research project under weekly faculty supervision. Credit/No Credit only. May be repeated for credit (9 semester credit hours maximum). Instructor consent required. ([1-3]-0) S

NSC 4V99 Independent Study (1-3 semester credit hours) Student studies advanced topics under weekly faculty supervision. Credit/No Credit only. May be repeated for credit (6 semester credit hours maximum). Instructor and Associate Dean consent required. ([1-3]-0) S