Cognitive Science

**CGS 1100** First Year Seminar (1 semester hour) This course is designed to introduce incoming freshmen to the intellectual and cultural environment of the School of Behavioral and Brain Sciences (BBS). Students will learn about plans of study and career paths for majors in Psychology, Neuroscience, Speech Language Pathology and Audiology, Child Learning and Development, and Cognitive Science. Required for all freshman Behavioral and Brain Sciences majors; open to all non-BBS majors. Corequisite: **UNIV 1010**. (Same as **CLDP 1100** and **NSC 1100** and **PSY 1100** and **SPAU 1100**) (1-0) Y

**CGS 2301** Cognitive Science (3 semester hours) An introduction to the study of the brain and behavior from the point of view of cognitive science, including approaches from psychology, philosophy, neuropsychology, and computational modeling. Includes phenomena involving sensory systems, memory, decision making, language, and communication. (3-0) Y

**CGS 3325** Historical Perspectives on Psychology: Mind and Machines since 1600 (3 semester hours) Basic frames of reference in 20th-century psychology and their historical development in Western thought since 1600 with an emphasis on issues involved with minds, brains, and machines. Includes behaviorism, learning theory, artificial intelligence, and gestalt, structural and cognitive approaches. Prerequisite: **PSY 23 01** or **CGS 2301**. (Same as **PSY 3360**) (3-0) Y

**CGS 3340** Experimental Projects in Cognitive Science (3 semester hours) Laboratory and field experience in designing and conducting research, with a major emphasis on writing research reports. (This course fulfills the advanced writing requirement for Cognitive Science majors and 3 hours of the Communication component of the Core Curriculum). Prerequisite: **PSY 3392** or **PSY 3490**. (Same as **PSY 3393**) (3-0) S

**CGS 3342** Cognitive and Neural Modeling Laboratory (3 semester hours) Computational Neuroscience, Cognitive Neural Modeling, and Mathematical Psychology modeling methodologies are introduced through the use of computer-based simulation modeling experiments. Linear Algebra (**MATH 2418**) and Computer Programming experience are recommended but not required. (3-0) T

**CGS 3361** Cognitive Psychology (3 semester hours) Theory and research on perception, learning, thinking, psycholinguistics, and memory. Prerequisite: **CGS 2301** or **PSY 2301**. (Same as **PSY 3361**) (3-0) Y

**CGS 4188** Dean's Scholars' Seminar (1 semester hour) A course for students enrolled in the Dean's Scholars' Program (minimum 3.600 GPA and 30 graded hours at UTD) who wish to pursue doctoral-level professional careers. The seminar introduces scholars to the quality and demands of doctoral-level careers and includes service activities in BBS. Aims of the seminar include 1) learning about requirements for admission into doctoral level programs, 2) meeting with professionals to learn how they built their careers and with BBS faculty to learn about research and internship opportunities, 3) introduction to demands of doctoral-level careers, and 4) participation in BBS service activities. This course is required for all students seeking to graduate as BBS Dean's Scholars. Offered only in fall semester. (Same as **CLDP 4188** and **PSY 41 88** and **NSC 4188** and **SPAU 4188**) (1-0) Y

**CGS 4312** Computational Modeling Methods for Language Understanding (3 semester hours) Probabilistic-based methods for natural language understanding using the MATLAB programming language. (3-0) T

**CGS 4313** Neural Net Mathematics (3 semester hours) Vector calculus and vector calculus-based
probability theory with artificial neural network modeling applications. Intended to provide mathematics preparation for CGS 4314 and CGS 4315. Prerequisite: CGS 3342 and (MATH 2418 and MATH 2451) and (either STAT 4351 or STAT 3341) or instructor consent required. (3-0) T

CGS 4314 Intelligent Systems Analysis (3 semester hours) Mathematical tools for investigating the asymptotic behavior of both deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include: artificial neural network architectures, Lyapunov stability theory, nonlinear optimization theory, stochastic approximation theory, and the Gibbs Sampler. Prerequisite: CGS 4313 or equivalent or instructor consent required. (Same as CS 4314) (3-0) T

CGS 4315 Intelligent Systems Design (3 semester hours) Mathematical tools for the design and evaluation of artificially intelligent deterministic and stochastic nonlinear dynamical systems for the purposes of building computational models in the fields of neuroscience, psychology, and artificial intelligence. Topics include: (1) Markov Random Field probability representations, and (2) asymptotic mathematical statistical theory for: parameter estimation, model selection, and hypothesis testing. Prerequisite: (CGS 4314 or CS 4314) or instructor consent required. (Same as CS 4315) (3-0) T

CGS 4352 Human Computer Interactions I (3 semester hours) Methods and principles of human-computer interaction (HCI), user-centered design (UCD), and usability evaluation. Provides broad overview of HCI and how HCI informs UCD processes throughout product development lifecycle. (Same as CS 4352) (3-0) T

CGS 4353 Human Computer Interactions II (3 semester hours) Detailed exploration of human-computer interaction (HCI) through readings in journal articles and research reports. Practical experience in methodology typically used in the design of usable systems. Prerequisite: (CGS 4352 or CS 4352) or instructor consent required. (Same as CS 4353) (3-0) T

CGS 4355 Human Computer Interactions Lab (3 semester hours) Provides students with resources to learn and perform hands-on lab-based techniques such as usability testing and cognitive walkthroughs. Prerequisite or corequisite: (CGS 4352 or CGS 4353) or instructor consent required. (3-0) T

CGS 4359 Cognitive Neuroscience (3 semester 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 NSC 4359 and PSY 4359) (3-0) Y

CGS 4362 Perception (3 semester hours) Considers the processes by which the individual gathers information from the external world, the physiological basis of those processes, and how they develop throughout the life span of the individual. Prerequisite: CGS 2301 or PSY 2301 (Same as PSY 4362) (3-0) Y

CGS 4364 Attention and Memory (3 semester hours) Factors influencing the capacity to pick up, organize, and remember complex information. Prerequisite: (CGS 3361 or PSY 3361) or instructor consent required. (Same as PSY 4364) (3-0) R

CGS 4375 Honors Seminar (3 semester hours) A course for students enrolled in the Honors Program (minimum 3.500 GPA and 30 graded hours at UTD) who will conduct undergraduate thesis research in BBS. The seminar attempts to hone skills of critical thinking, creativity, and effective written and oral communication. By the end of the seminar, all students will have determined 1) a thesis approach, 2) a
CGS 4385 Neuropsychology (3 semester 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 NSC 4385 and PSY 4385) (3-0) T

CGS 4386 Adult Development and Aging (3 semester hours) This course is designed to provide an overview of theories, methods, and research on the psychological, social, and biological aspects of adult development and aging. A selection of topics to be covered includes lifespan developmental theories, research methodology, cognitive aging, compensation and successful aging, personality development, health, coping, social-emotional development, and to understand the nature and multiple influences of development throughout the adult lifespan. Prerequisite: PSY 2301. (Same as NSC 4386 and PSY 4386 and SPAU 4386) (3-0) T

CGS 4394 Internship in Cognitive Science (3 semester 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. Graded Credit/No Credit only. (Same as CLDP 4394 and NSC 4394 and PSY 4394 and SPAU 4396) (3-0) S

CGS 4395 Co-op Fieldwork (3 semester hours) Students earn course credit for field experience in an approved business or government setting. Requires working at least 8 hours per week. Students will keep a journal of their workplace experience, maintain contact with the instructor, and prepare a written report that focuses on the accomplishments and insights gained through their co-op experience. Open to students in good academic standing with a GPA of at least 2.500. Credit will not be awarded retroactively. Apply for placements through the Career Center office. May be repeated for credit (6 hours maximum). Graded Credit/No Credit only. (Same as CLDP 4395 and PSY 4395) (3-0) Y

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

CGS 4v90 Special Topics in Cognitive Science (1-6 semester hours) May be repeated for credit as topics vary (9 hours maximum). (3-0) R

CGS 4v96 Teaching Internship (1-3 semester 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. Instructor and Associate Dean consent required. Graded Credit/No Credit only. May be repeated (6 hours maximum). ([1-3]-0) S

CGS 4v98 Directed Research (1-3 semester hours) Student assists faculty with research projects or conducts a research project under weekly faculty supervision. Instructor consent required. Taken on a credit/no credit basis. May be repeated for credit (6 hours maximum). Instructor consent required. ([1-3]-0)
CGS 4v99 Individual Study (1-3 semester hours) Student studies advanced topics under weekly faculty direction. Instructor and Associate Dean consent required. Graded Credit/No Credit only. May be repeated for credit (6 hours maximum). ([1-3]-0) S