Cognitive Sciences (COGS)

Courses

COGS 10A. Exploratory Data Analysis. 4 Units.
Learn multiple ways of visualizing data, of transforming data, looking for consistencies and patterns in data, and interpreting these patterns to reach conclusions. Serves as first introduction to computer programming using the R language.

Same as PSYC 10A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment. Hearing and Speech Sciences Minors have first consideration for enrollment.

(Va)

COGS 10B. Probability and Inference. 4 Units.
An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic and logical basis of formal statistical inference, and the concept of statistical evidence. Applications in R.

Prerequisite: PSYC 10A or COGS 10A. PSYC 10A with a grade of C- or better. COGS 10A with a grade of C- or better

Same as PSYC 10B.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Hearing and Speech Sciences Minors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

(Va)

COGS 10C. Statistical Models. 4 Units.
Students learn about standard procedures in statistics for the social sciences, with a focus on linear models for discovering the underlying structure in data. Applications in R.

Prerequisite: PSYC 10A or COGS 10A. PSYC 10A with a grade of C- or better. COGS 10A with a grade of C- or better

Same as PSYC 10C.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Hearing and Speech Sciences Minors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

(Vb)

COGS 14M. MATLAB Programming. 4 Units.
MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes.

Same as PSYC 14M.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 14P. Scientific Python for Research. 4 Units.
Introduces Python for data analysis and modeling encountered in cognitive science and neuroscience. Topics include data structures, execution control, graphic visualization, and interaction with sound and display interfaces. Application in statistical analysis, model simulation, and stimulus presentation and experimental control.

Same as PSYC 14P.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 60N. Neurobiology of Cognition. 4 Units.
Introduces the neurobiological components of human cognition. Topics include discussion of the cortical structures and functions that underlie these behaviors. Emphasis placed on the development and organization of the healthy brain.

Same as PSYC 60N.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 89. Special Topics in Lower-Division Cognitive Sciences. 4 Units.
Studies in selected areas of cognitive science at the lower-division level. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS H101A. Honors Seminar in Psychology and Cognitive Sciences I. 4 Units.
Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Grading Option: Pass/no pass only.

Same as PSYC H101A.

Restriction: Cognitive Sciences Honors students only. Psychology Honors students only.

COGS H101B. Honors Seminar in Psychology and Cognitive Sciences II. 4 Units.
Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYC H101A or COGS H101A

Grading Option: Pass/no pass only.

Same as PSYC H101B.

Restriction: Cognitive Sciences Honors students only. Psychology Honors students only.

COGS H101C. Honors Seminar in Psychology and Cognitive Sciences III. 4 Units.
Focuses on the research activities and honors thesis research projects of each student and the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups required.

Prerequisite: PSYC H101B or COGS H101B

Same as PSYC H101C.

Restriction: Cognitive Sciences Honors students only. Psychology Honors students only.

COGS 105. Introduction to Statistical Learning. 4 Units.
Introduction to statistical learning as a tool for scientific research. Topics include linear regression, logistic regression, model selection, cross-validation, ridge and Lasso regularization, classification trees, ensemble methods, random forests, unsupervised learning, PCA, k-means clustering, Gaussian mixture models, and PLS regression.

Prerequisite: COGS 14P or PSYC 14P or ICS 31 or MATH 9 and ((COGS 10B or PSYC 10B) and (COGS 10C or PSYC 10C) or STATS 110) and MATH 2B. COGS 10B with a grade of C- or better. PSYC 10B with a grade of C- or better. COGS 10C with a grade of C- or better. PSYC 10C with a grade of C- or better

Restriction: Cognitive Sciences Majors only.

Concurrent with COGS 205C.

COGS 106. Computational Lab Skills. 4 Units.
Teaches programming tools, skills, and conventions for collaborative work in computational cognitive science. Topics covered include program structure, version control, random number generation, plotting, basic model fitting, and numerical optimization methods.

Prerequisite: COGS 14M or PSYC 14M or COGS 14P or PSYC 14P or ICS 31 and ((COGS 10B or PSYC 10B) and (COGS 10C or PSYC 10C) or STAT 110). COGS 10B with a grade of C- or better. PSYC 10B with a grade of C- or better. COGS 10C with a grade of C- or better. PSYC 10C with a grade of C- or better

Restriction: Cognitive Sciences Majors only.

Concurrent with COGS 205B.

COGS 107. Cognitive Modeling. 4 Units.
Cognitive process models analyzed using computational Bayesian methods. Formal statistical specification of models, parameter estimation, model evaluation, and research applications. Covers multinomial process trees, signal detection theory, Thurstone ranking models, item-response theory, decision models, and reaction time models.

Prerequisite: COGS 14M or PSYC 14M or COGS 14P or PSYC 14P or ICS 31 and ((COGS 10B or PSYC 10B) and (COGS 10C or PSYC 10C)) or STAT 110. COGS 10B with a grade of C- or better. PSYC 10B with a grade of C- or better. COGS 10C with a grade of C- or better. PSYC 10C with a grade of C- or better

Restriction: Cognitive Sciences Majors have first consideration for enrollment.

COGS 108. Neural Analytics. 4 Units.
Introduces the theoretical foundations and practical applications of neural data analysis. Topics include models of neural signals, neural time series analysis, and machine learning applications in cognitive neuroscience.

Prerequisite: COGS 14M or PSYC 14M or COGS 14P or PSYC 14P or ICS 31 and ((COGS 10B or PSYC 10B) and (COGS 10C or PSYC 10C)) or STAT 110. COGS 10B with a grade of C- or better. PSYC 10B with a grade of C- or better. COGS 10C with a grade of C- or better. PSYC 10C with a grade of C- or better

Restriction: Cognitive Sciences Majors have first consideration for enrollment.

COGS 109. Cognitive Sciences Research Seminar. 4 Units.
Read and discuss examples of the primary research leading to the concepts covered in Psychology Fundamentals. Focuses on how this research is conducted and how inferences from it are drawn.

Prerequisite: (PSYC 9A and PSYC 9B and PSYC 9C) or (PSCI 11A and PSCI 11B and PSCI 11C)

Restriction: Cognitive Sciences Majors only.

COGS 112A. Experimental Psychology. 4 Units.
Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections.

Corequisite: COGS 112LA or PSYCH 112LA. COGS 112LA is the corequisite for COGS 112A. PSYCH 112LA is the corequisite for PSYCH 112A.
Prerequisite: ((PSYC 9A and PSYC 9B and PSYC 9C) or (PSCI 11A and PSCI 11B and PSCI 11C) and (PSYC 10B or COGS 10B) and (PSYC 10C or COGS 10C)). PSYC 10B with a grade of C- or better. COGS 10B with a grade of C- or better. PSYC 10C with a grade of C- or better. COGS 10C with a grade of C- or better

Same as PSYC 112A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112BW. Advanced Experimental Psychology. 4 Units.
Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research.

Prerequisite: PSYC 112A and PSYC 112LA. Satisfactory completion of the Lower-Division Writing requirement.

Same as PSYC 112BW.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

(Ib)

COGS 112C. Research in Experimental Psychology. 4 Units.
Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter.

Corequisite: PSYC 112LC
Prerequisite: PSYC 112B and PSYC 112LB

Same as PSYC 112C.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112LA. Experimental Psychology Laboratory. 2 Units.
Required laboratory section and co-requisite for PSYCH 112A.

Corequisite: COGS 112A or PSYCH 112A. COGS 112A is the corequisite for COGS 112LA. PSYCH 112A is the corequisite for PSYCH 112LA

Same as PSYC 112LA.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112LB. Advanced Experimental Psychology Laboratory. 2 Units.
Required laboratory section for PSYCH 112B and PSYCH 112BW.

Same as PSYC 112LB.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112LC. Research in Experimental Psychology.
Required laboratory section and co-requisite for PSYCH 112C.

Corequisite: PSYC 112C

Same as PSYC 112LC.

COGS 112LN. fMRI Research Laboratory. 2 Units.
Required laboratory section and corequisite for COGS 112N/PSYCH 112N.

Corequisite: COGS 112N and PSYC 112N and COGS 112N is the corequisite for COGS 112LN. PSYCH 112N is the corequisite for PSYCH 112LN.

Same as PSYC 112LN.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112LP. Research in Perception and Psychophysics Laboratory. 2 Units.
Required laboratory section and co-requisite for COGS 112P.

Corequisite: COGS 112P or PSYCH 112P. COGS 112P is the corequisite for COGS 112LP. PSYCH 112P is the corequisite for PSYCH 112LP.

Same as PSYC 112LP.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112LR. Cognitive Robotics Laboratory. 2 Units.
Required laboratory section and corequisite for PSYCH 112R.

Corequisite: COGS 112R or PSYCH 112R. COGS 112R is corequisite for COGS 112LR. PSYCH 112R is corequisite for PSYCH 112LR.

Same as PSYC 112LR.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112N. Introduction to fMRI Research. 4 Units.
Introduction to functional magnetic resonance imaging as a tool in cognitive neuroscience. Covers inferences about brain activity using MRI, evaluates experimental design considerations, and univariate and multivariate statistical analysis approaches.

Corequisite: COGS 112LN or PSYCH 112LN. COGS 112LN is the corequisite for COGS 112N. PSYCH 112LN is the corequisite for PSYCH 112N. Prerequisite: (PSYC 9A and PSYC 9B and PSYC 9C) or (PSCI 11A and PSCI 11B and PSCI 11C) and (COGS 10B or PSYC 10B) and (COGS 10C or PSYC 10C). COGS 10B with a grade of C- or better. PSYC 10B with a grade of C- or better. COGS 10C with a grade of C- or better. PSYC 10C with a grade of C- or better

Same as PSYC 112N.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112P. Research in Perception and Psychophysics. 4 Units.
Introduction to design and practice of experiments: students perform auditory, visual, tactile, or other experiments. Emphasis on methodology, finding and reading previous research, generating research ideas, statistical analysis.

Corequisite: COGS 112LP or PSYCH 112LP. COGS 112LP is the corequisite for COGS 112P. PSYCH 112LP is the corequisite for PSYCH 112P.
Prerequisite: (PSYC 9A and PSYC 9B and PSYC 9C) or (PSCI 11A and PSCI 11B and PSCI 11C) and (PSYC 10B or COGS 10B) and (PSYC10C and COGS 10C). PSYC 10B with a grade of C- or better. COGS 10B with a grade of C- or better. PSYC10C with a minimum score of C-. COGS 10C with a grade of C- or better

Same as PSYC 112P.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 112R. Cognitive Robotics. 4 Units.
Introduces concepts on experimental design, embodiment, robot construction, and computer programming. Concepts of embodied intelligence and case studies of cognitive robotics are covered in lecture. Simple robots are constructed and programmed to carry out different behavioral experiments in lab.

Corequisite: COGS 112LR or PSYCH 112LR. COGS 112LR is the corequisite for COGS 112R. PSYCH 112LR is the corequisite for PSYCH 112R.
Prerequisite: (PSYC 9A and PSYC 9B and PSYC 9C) or (PSCI 11A and PSCI 11B and PSCI 11C) and (PSYC 10B or COGS 10B) and (PSYC 10C or COGS 10C). PSYC 10B with a grade of C- or better. COGS 10B with a grade of C- or better. PSYC 10C with a grade of C- or better. COGS 10C with a grade of C- or better

Same as PSYC 112R.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 130A. Perception and Sensory Processes. 4 Units.
A general introduction to the scientific study of sensory processes and perceptual phonomena, with special emphasis in the visual systems.

Prerequisite: (PSYC 7A or PSCI 9) or (PSYC 9A or PSCI 11A)

Same as PSYC 130A.
Overlaps with PSYC 131A, PSYC 131B.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 130N. Neuroscience of Perception. 4 Units.
Introduces the principles that human perception is determined by the properties of brain circuitry and that these brain circuits evolved to interpret the properties of the physical environment to explore human perception from peripheral sensory organs to cortical processing.

Prerequisite: PSYC 7A or PSCI 9 or PSYC 9A or PSCI 11A

Same as PSYC 130N.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 131A. Vision. 4 Units.
Visual perception and the anatomy and physiology of the visual system. Topics include the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system.

Same as BIOL N182, PSYC 131A.
Overlaps with PSYC 130A.

Restriction: Upper-division students only. School of Biological Sciences students have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 131B. Hearing. 4 Units.
Auditory perception, the anatomy and physiology of the auditory system, and the physics of sound. Topics include neural transduction of sound, sensitivity, sound localization, complex sound perception, and hearing loss.

Prerequisite: (PSYC 9A or PSCI 11A) and (PSYC 9B or PSCI 11B)

Same as PSYC 131B.
Overlaps with PSYC 130A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 139. Special Topics in Perception and Sensory Processes. 4 Units.
Studies in selected areas of perception and sensory processes. Topics addressed vary each quarter.

Prerequisite: Prerequisites vary.

Repeatability: Unlimited as topics vary.

Same as PSYC 139.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 140J. Judgment and Decision Making. 4 Units.
The psychology of human decision making. Theories, models, experiments, and data that inform how people make choices, judgments, and other decisions. Topics include optimality and bias, mental simulation, learning and feedback, expertise, emotional effects, and group decision making.

Prerequisite: PSYC 9A and PSYC 9B

Same as PSYC 140J.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 140L. Learning and Decision Making. 4 Units.
The psychological and neural bases of learning about and interacting with the world. Topics include shaping of behavior by rewards and punishments, abstraction of relational information, goal-directed versus habitual decision strategies, social knowledge transmission, and behavioral and substance addictions.

Prerequisite: (PSYC 7A or PSCI 9) or (PSYC 9A or PSCI 11A)

Same as PSYC 140L.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 140M. Human Memory. 4 Units.
Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory.

Prerequisite: (PSYC 7A or PSCI 9) or (PSYC 9B or PSCI 11B)

Same as PSYC 140M.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 160A. Introduction to Cognitive Neuroscience. 4 Units.
Introduction to the neural basis of human perceptual, motor, and cognitive abilities. Topics include sensory perception, motor control, memory, language, attention, emotion, frontal lobe function, functional brain imaging, and neuropsychological disorders.

Prerequisite: (PSYC 7A or PSCI 9) or ((PSYC 9A or PSCI 11A) and (PSYC 9B or PSCI 11B))

Same as PSYC 160A.

Restriction: Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 160D. Brain Disorders and Behavior. 4 Units.
Examines the localization of human brain functions and the effects of neurological disorders on psychological functions such as perception, motor control, language, memory, and decision-making.

Prerequisite: (PSYC 7A or PSCI 9) or ((PSYC 9A or PSCI 11A) and (PSYC 9B or PSCI 11B)) or BIOL 35 or BIOL N110 or BIOL N115A

Same as BIOL N165, PSYC 160D.

Restriction: Biological Sciences Majors have first consideration for enrollment. Cognitive Sciences Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

COGS 201A. Cognitive Sciences Research Seminar. 1.3 Unit.
Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

COGS 201B. Cognitive Sciences Research Seminar. 1.3 Unit.
Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

COGS 201C. Cognitive Sciences Research Seminar. 1.4 Unit.
Weekly reports and colloquia by faculty, students, and visitors.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

COGS 202A. Proseminar in the Cognitive Sciences. 1 Unit.
Introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

COGS 203A. Statistical Models for Cognitive Sciences I . 4 Units.
Logic and set theory are covered during the first three weeks, using an interactive computer system. The remaining seven weeks are devoted to probability theory and cover elementary concepts from samples spaces to Chebychev's Inequality and the moment generating function.

Restriction: Graduate students only.

COGS 203B. Statistical Models for Cognitive Sciences II . 4 Units.
An introduction to statistical estimation and statistical inference. Topics include sufficiency and the Rao-Blackwell Theorem, completeness and the Lehmann-Scheffe Theorem. The method of maximum likelihood is explored in some detail. Inference in linear models covers regression and analysis of variance.

Restriction: Graduate students only.

COGS 203C. Statistical Models for Cognitive Sciences III . 4 Units.
Discussion of the fundamentals of statistical inference and computational implementations of common statistical models.

Restriction: Graduate students only.

COGS 203D. Applied Mathematics for Cognitive Sciences. 4 Units.
Covers the basics of linear systems analysis, focusing on linear algebra, Fourier analysis, differential equations, and elementary signal processing. Applications in Cognitive Science and Cognitive Neuroscience research are developed.

Restriction: Graduate students only.

COGS 204A. Seminar in Professional Development. 1 Unit.
Development of professional skills. Focuses on grant writing and submission process, responsible conduct of research, and ethics training.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only. Psychology Majors only.

COGS 204B. Seminar in Professional Development. 1 Unit.
Development of professional skills. Focus on scientific presentations and preparation.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only. Psychology Majors only.

COGS 204C. Seminar in Professional Development. 1 Unit.
Development of professional skills. Focuses on career opportunities, interests and information, and community outreach.

Grading Option: Satisfactory/unsatisfactory only.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only. Psychology Majors only.

COGS 205A. Introduction to Programming. 4 Units.
Introduces rudiments of programming, statistical analysis and probability theory, graphic visualization, GUI design, spectral analysis, and simulation models using MATLAB, a software package for solving quantitative problems often encountered in experimental psychology.

Restriction: Graduate students only.

COGS 205B. Computational Lab Skills for Cognitive Scientists I. 4 Units.
Provides an in-depth introduction to writing MATLAB programs to run auditory and visual experiments. Topics covered include program structure, stimulus generation, presentation, and data collection.

Restriction: Graduate students only.

COGS 205C. Introduction to Statistical Learning. 4 Units.
Introduction to statistical learning for scientific research. Topics include linear regression, logistic regression, model selection, cross-validation, ridge and Lasso regularization, classification trees, ensemble methods, random forests, unsupervised learning, PCA, k-means clustering, Gaussian mixture models, and PLS regression.

Prerequisite: Required: Knowledge of calculus, computer programming, and undergraduate-level statistics.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

Concurrent with COGS 105.

COGS 205D. Neural Networks and Machine Learning. 4 Units.
An introduction and review of the current state of the art in neural networks and machine learning with specific emphasis of applications to behavioral and neuroscience data analysis and modeling.

Restriction: Graduate students only.

COGS 210A. Cognitive and Brain Sciences I: Topics in Perception. 4 Units.
Discusses models of cognition and evidence linking cognition and the brain. Focus is on visual, auditory, and somatic perception and bottom-up mechanisms of attention.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 210B. Cognitive and Brain Sciences II: Topics in Cognition. 4 Units.
Discusses models of cognition and evidence linking cognition and the brain. Focus is on emotion, top-down attention, goal-directed behavior, categorization, judgment, and decision-making.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 210C. Cognitive and Brain Sciences III: Topics in Learning and Development. 4 Units.
Discusses experimental data, formal models of learning, and evidence linking learning and development to its neural substrates. Topics include Pavlovian and instrumental conditioning, language acquisition, causal reasoning, perceptual learning, category formation, and structure learning.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 213. The Mind/Body Problem. 4 Units.
Multidisciplinary, drawing on information from the fields of quantum physics, computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

Restriction: Graduate students only.

COGS 214. Bayesian Cognitive Modeling. 4 Units.
Considers a range of statistical methods of data analysis and simple cognitive models using the Bayesian graphical modeling framework.

Restriction: Graduate students only.

COGS 218. Hearing. 4 Units.
Examines auditory sensation and perception using psychophysical and neuroscientific perspectives. Covers physical aspects of sound; subcortical auditory processing; aspects of sensation and perception such as sensitivity, sound localization, and complex-sound recognition; neuroscientific studies of cortical function; and abnormal auditory processing.

Restriction: Graduate students only.

COGS 229. Special Topics in Human Cognition. 1.3-4 Units.
Current research in brain/ behavior relationships, human memory, and learning theory is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 235. Analysis of Neural Time Series. 4 Units.
Hands-on introduction to techniques for the analysis of neural time series data, with a primary focus on the electroencephalogram (EEG). Topics may include the physiological basis of EEG, time-frequency analysis, spatial filtering, and methods of assessing connectivity.

Same as BME 235.

Restriction: Graduate students only.

COGS 237. Advanced Bayesian Cognitive Modeling. 4 Units.
Considers a range of advanced cognitive process models including models of signal detection, memory retention, category learning, stimulus representation, and reasoning using the Bayesian graphical modeling framework.

Prerequisite: COGS 214. COGS 214 with a grade of B- or better

Restriction: Graduate students only.

COGS 239. Special Topics in Methodology and Models. 1.3-4 Units.
Current research in cognitive sciences methodologies, concepts, and models is presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 259. Special Topics in Human Performance. 1.3-4 Units.
Current research in the human issues involved with sensation, perception, and cognition.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 261N. Cortical Neuroscience. 4 Units.
Physiology of the cerebral cortex, theoretical neuroscience, and the neural basis of perception.

Restriction: Graduate students only.

COGS 262. Functional Neuroanatomy. 4 Units.
It is impossible to truly understand human behavior without some understanding of the physical structure that enables behavior. Examines recent findings in functional neuroantomy through lectures and papers discussing links between particular behaviors and specific brain structures.

Restriction: Graduate students only.

COGS 265. Introduction to Functional MRI. 4 Units.
Describes the fundamentals of imaging the human brain function using functional Magnetic Resonance Imaging (fMRI). Topics include basic fMRI physics, experimental design, and data acquisition and analysis.

Restriction: Graduate students only.

COGS 268A. Computational Neuroscience. 4 Units.
Introduction to computational neuroscience. Mathematical models of single neurons, neural circuits, thalamocortical systems, and cortical mass action can stimulate single-unit, local field potential, and EEG dynamics. These models are used to investigate mechanisms of sensation, motor control, attention, and consciousness.

Restriction: Graduate students only.

COGS 268R. Cognitive Robotics. 4 Units.
Introduces concepts for studying cognitive function by embedding brain models on robotic platforms. Topics include robot construction, computer programming, and the notion of embodiment. Students construct simple robots and program these robots to perform different behaviors.

Restriction: Graduate students only.

COGS 269. Special Topics in Cognitive Neuroscience. 1.3-4 Units.
Current research in cognitive neuroscience.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 289. Special Topics in Sensation and Perception. 1.3-4 Units.
Current research in the reception and processing of visual and auditory stimuli presented.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

COGS 290. Dissertation Research. 1-12 Units.
Dissertation research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only. Cognitive Neuroscience Majors only. Cognitive Sciences Majors only.

COGS 299. Individual Study. 4-12 Units.
Individual research with Cognitive Science faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.