

# Department of Psychology Courses

## Note on Course Numbers

Each Carnegie Mellon course number begins with a two-digit prefix which designates the department offering the course (76-xxx courses are offered by the Department of English, etc.). Although each department maintains its own course numbering practices, typically the first digit after the prefix indicates the class level: xx-1xx courses are freshmen-level, xx-2xx courses are sophomore level, etc. xx-6xx courses may be either undergraduate senior-level or graduate-level, depending on the department. xx-7xx courses and higher are graduate-level. Please consult the Schedule of Classes (<https://enr-apps.as.cmu.edu/open/SOC/SOCServlet>) each semester for course offerings and for any necessary pre-requisites or co-requisites.

## 85-102 Introduction to Psychology

Fall and Summer: 9 units

The world is a crazy, confusing place. Much of what we encounter is ambiguous, dynamic, and misleading. Somehow, we have to make sense of it. And because we can't leave well enough alone, we also try to make sense of ourselves and the people with whom we interact. This class is about how we do that. The course provides an overview of the major areas of scientific psychology, exploring the models of our mind, brain, and behavior that explain wide areas of human (and non-human) functioning. Topics range from neuroscience and the biological basis of behavior, to memory and thought, to social interaction and psychological development over the lifespan, to abnormal psychology, psychopathology, and treatment. Tuesday and Thursday lectures will provide a broad survey of topics and findings in psychology and how to use scientific reasoning to answer questions about the mind. Recitation sections will focus on learning the methods, issues, and applications germane to empirical psychology. At the end of this course, students will not only be more knowledgeable about psychology, but be able to apply their knowledge about psychology to be better thinkers, learners, and consumers of information in general.

## 85-198 Research Training: Psychology

Fall and Spring: 9 units

See [www.hss.cmu.edu/aac](http://www.hss.cmu.edu/aac) and click on (forms and guides informational handout page) then click on current freshman-sophomore research training courses for listing of research training course descriptions.

Course Website: <http://www.hss.cmu.edu/aac>

## 85-211 Cognitive Psychology

Fall and Spring: 9 units

How do people perceive, learn, remember, and think? This course will consider perception, language, attention, learning, memory, reasoning, and decision making. Experimental findings and formal models will be discussed in each part of the course.

## 85-213 Human Information Processing and Artificial Intelligence

Fall: 9 units

This class will review various results in cognitive psychology (attention, perception, memory, problem solving, language) and use of artificial intelligence techniques to simulate cognitive processes.

Prerequisites: 15-150 or 15-122

## 85-219 Biological Foundations of Behavior

Fall: 9 units

This course will provide students with a general introduction to the underlying biological principles and mechanisms which give rise to complex human cognitive, perceptual and emotional behavior. Topics to be covered include: the anatomical structure of nerve cells and how they communicate, properties of brain organization and function, processing in sensory and motor systems, biological characteristics of human cognition, and neural and hormonal influences on health and emotion. This course will focus on how emerging methods and approaches are beginning to make it possible for psychologists, computer scientists, and biologists to gain an integrated understanding of complex behavior.

## 85-221 Principles of Child Development

Fall and Spring: 9 units

This course is about normal development from conception through adolescence. Topics include physical, perceptual, cognitive, emotional and social development. Students will learn facts about children at various points in development, theories about how development works, and research methods for studying development in infants and children. Students will be encouraged to relate the facts, theories and methods of developmental psychology to everyday problems, social issues and real world concerns.

## 85-241 Social Psychology

Fall and Spring: 9 units

The focus of this course will be on how peoples behavior, feelings and thoughts are influenced or determined by their social environment. The course will begin with lectures and readings on how social psychologists go about studying social behavior. Next, various topics on which social psychologists have done research will be covered. These topics will include: person perception, prejudice and discrimination, the nature of attitudes and how attitudes are formed and changed, interpersonal attraction, conformity, compliance, altruism, aggression, group behavior, and applications of psychology to problems in health care, law, politics, and the environment. Through readings and lectures on these topics, students will also be exposed to social psychological theories.

## 85-251 Personality

Intermittent: 9 units

The primary purpose of personality psychology is to understand human uniqueness—how and why it is that one person differs from others, in terms of the ways he or she thinks, feels, and acts. Students in the course will be exposed to several broad theoretical perspectives, each of which attempts to capture and understand the origins and consequences of individual distinctiveness from a slightly different vantage point. Included among these approaches are the dispositional, psychoanalytic, learning, phenomenological, and cognitive self regulation perspectives. This is a survey course and is intended to provide students with a broad background of theory and research in the area. Class meetings consist primarily of lecture, but there is some discussion too. In addition, classroom exercises will allow students to test their own personalities.

## 85-261 Abnormal Psychology

Fall and Spring: 9 units

The study of psychopathology is not an exact science; nor are there many clear-cut parameters with which to differentiate "normal" and "abnormal" behavior. This course will focus on learning about and understanding the range of behaviors which fall within the province of "abnormal" psychology. Its approach will be descriptive, empirical, theoretical and conceptual. Students will examine definitions of "abnormality" in an historical and contemporary context, explore issues relevant to diagnosis and patient care, be introduced to various psychological diagnostic categories, and develop an appreciation of the range of treatments for these disorders.

## 85-281 Introduction to Clinical Psychology

Spring: 9 units

This course is designed to introduce students to a wide variety of concepts in the area of clinical psychology. We will explore clinical psychology in an historical perspective, ethics related to the practice of psychology, and various theories of psychotherapy (including psychoanalytic, psychodynamic, existential, and cognitive behavioral). Also, we will look at group theories underlying group therapy and family/systems therapy.

Prerequisites: 85-251 or 85-261

## 85-310 Research Methods in Cognitive Psychology

Fall and Spring: 9 units

This is a course in which students develop the research skills associated with cognitive psychology and cognitive science. Students learn how to design and conduct experiments, and analyze and interpret the data they collect. The course covers a variety of experimental designs, e.g., factorial, Latin Squares. Analyses of response times, qualitative data, and signal detection are also covered. Cognitive modeling will also be discussed. Topics include mental imagery, memory, and perception. The class format consists of lectures, discussions and student presentations.

Prerequisites: (85-211 and 36-309) or (36-309 and 85-213)

## 85-314 Cognitive Neuroscience Research Methods

Intermittent: 9 units

This is a hands-on laboratory course designed to foster basic skills in the empirical approaches used in cognitive neuroscience research. Students will learn how to design experiments using both correlational and interference methods, learn basic analytical approaches and how to formally present empirical results. Topics will include MRI (structural and functional), electrophysiology, brain stimulation methods, neuropsychological approaches, experimental design (e.g., event-related vs. blocked trials) and basic data analysis. You must have taken 36-309 previously. A background in basic neurobiology, such as 85-219, and some experience with Matlab are encouraged but not required.

Prerequisite: 36-309

**85-320 Research Methods in Developmental Psychology**

Fall and Spring: 9 units

This is a laboratory course, in which the student will have direct experience working with children, as well as writing research reports and designing and critiquing research in child development. The purpose of the course is to develop research expertise that will assist the student both in carrying out research and in evaluating the research of others. Special emphasis will be given to the unique methodological problems associated with the study of development. Students must be sure they are also available to attend the Children's School during specific blocks in addition to the class meeting times. Either MW 8:30-10:30am, TR 8:30-10:30am, MW 12:30-2:15pm or MW 12:30-2:15pm.

Prerequisites: 36-309 and 85-221

**85-330 Analytic Research Methods**

Intermittent: 9 units

This class will teach students how to apply six major non-experimental research methods used in analytic behavioral analysis. Protocol Analysis. This method is used to study patterns and changes in problem-solving and their matches to theoretical models, including computational models. Corpus Analysis. This method is used to isolate patterns of behavioral and communication usage and change, as revealed through the study of the world-wide web and large computerized databases such as CHILDES, TalkBank, or the British National Corpus. Tools here include text searches and data-mining. Conversation Analysis. This is a microanalytic method used to examine sequencing, repair, and orientation in closely transcribed recordings of spoken interactions, as made available through systems such as the CABank database, as well as recorded programs on YouTube and elsewhere. Coding Systems. This approach seeks to capture interactional and behavioral structures in writing, teaching, interview, and other interactions. Here, there will be a special emphasis on the coding of instructional interactions. Gesture Analysis. This microanalytic method seeks to track patterns in gestural and nonverbal communication, often in association with spoken messages. Profile Analysis. This approach studies differences across learners at various ages and ability levels and group differences involving aphasia, autism, stuttering, dementia, and other individual differences. Students will work with data already available from previous studies, and will also learn to collect their own new datasets. Although the data being examined have been generated through naturalistic processes, they can be analyzed quantitatively using time-series analyses, non-parametric statistics, error matrices, and neural network simulations. In these various analyses, we will also consider how behavioral patterns are shape

Prerequisites: 85-320 or 85-340 or 85-310

**85-340 Research Methods in Social Psychology**

Fall and Spring: 9 units

This course is designed to provide students with the necessary knowledge to evaluate research, make transitions between theory and the operations that test the theory, and to design and carry out original research. Topics will include the nature of proof and causal inference, manipulation of independent variables, measurement of dependent variables, questionnaire design, experimental, and quasi-experimental, design and ethical issues involved in doing research. Survey, observational and experimental techniques as applied in both field and laboratory settings will be covered. Students will be expected to criticize completed research. They are also expected to design measures and complete their own original studies. During the course of the semester students will also be expected to design and carry out an original research project as well.

Prerequisites: (36-309 and 85-251) or (36-309 and 85-241) or (85-251 and 36-202) or (36-202 and 85-241)

**85-341 Organizational Communication**

Spring: 9 units

Much of the work in groups and organizations consists of communication. You communicate to get information that will be the basis of decisions, to provide a vision for the people who work for and with you, to coordinate activity, and to sell yourself and your work. The goal of this course is to identify sources of communication problems within an organization and ways to overcome them. To do this requires that we know how communication normally works, what parts are difficult, and how to fix it when it goes wrong. The focus of this course is on providing you with a broad understanding of the way communication operates within dyads, work groups, and organizations. This course is not a practicum in public speaking or writing, although you will get some experience writing, speaking, and managing impressions. Rather the intent is to give you theoretical and empirical underpinnings for the communication you will undoubtedly do when you return to work. Readings come from both the research and the managerial literatures. Among the topics considered are managerial communication, persuasion and conformity, self presentation and person perception, social networks. Cases and group projects give you an opportunity to apply what you've learned.

Prerequisites: 36-217 or 36-220 or 36-225 or 36-247 or 70-207 or 36-201 or 36-207

**85-345 Meaning in Mind and Brain**

Intermittent: 9 units

What does it mean to say that an object, word, event or sentence means something? What is the nature of semantic representations that are activated in the brain during comprehension, and how are they related to perceptual, linguistic, mnemonic and motor representations? How do these representations emerge over the course of development, and how can they be selectively impaired by brain damage? This course examines these and related questions by drawing on findings from a broad range of methodologies, including developmental studies of young children, behavioral studies of adults, neuropsychological studies of brain-damaged patients, neurophysiology and functional brain imaging, and computational modeling. The course will take a seminar format in which students read, present and discuss the current literature.

Prerequisites: 85-219 or 85-213 or 85-211

**85-350 Psychology of Prejudice**

Spring: 9 units

This course is devoted to the study of both traditional and more modern forms of prejudice and discrimination and the psychological processes that can arise from categorizations and stereotyping. The class provides an overview of the cognitive and emotional underpinnings of prejudice and discrimination as it pertains to many forms of inequality. The psychological theories underlying these behaviors will be examined as well as their impact on the lives of stigmatized individuals. Its goal is to examine a number of social differences and understand how prejudice can impact many areas of society. In addition to the traditional forms of prejudice based on such things as race, gender and age; other inequalities that result from less traditional groupings such as social class, appearance, and disability and will be explored. Research on issues of social identity, intergroup relations and the reduction of prejudice will be examined through readings and class activities.

Prerequisite: 85-241

**85-352 Evolutionary Psychology**

Intermittent: 9 units

This course will cover both the fundamentals of evolutionary psychology, including the theories of natural and sexual selection, with the overarching aim of providing an overview of the field at an advanced level. We will examine the relevance of evolutionary thinking to a range of psychological phenomena including problems of survival, long-term mating strategies, short-term sexual strategies, parenting, kinship, cooperative alliances, aggression and warfare, conflict between the sexes, and prestige, status, and social dominance. We will also examine evolutionary approaches to sensation and perception, development, consciousness, cognition, language, and abnormal behavior. Juniors and Seniors only or permission of instructor. Pre req: 85-102, 85-211, 85-221, 85-241 or 85-251

Prerequisites: 85-102 or 85-211 or 85-251 or 85-241 or 85-221

**85-353 Mindfulness: Science and Practice**

Intermittent: 9 units

This course will focus on blending first-person experience with mindfulness practices (including mindfulness meditation) and learning about the scientific research on mindfulness. Students will engage in guided mindfulness exercises, develop a daily mindfulness practice, and try out different mindfulness training traditions. In addition, much of this course will be focused on applying a critical eye to the theory, measures, mechanisms, and effects of mindfulness (and mindfulness training interventions) across multiple domains cognition, social processes, behavior, biological mechanisms, and health. As such, this will be a small seminar course focused developing first-person experiences of mindfulness and on discussing the debates and opportunities related to the emerging science of mindfulness.

Prerequisites: 85-310 or 85-320 or 85-340 or 85-314

**85-354 Infant Language Development**

Intermittent: 9 units

While adults struggle to learn languages, almost all infants acquire language with seemingly little effort. This course examines infants' learning abilities and language milestones with a focus on several different theoretical accounts of language development, and the way empirical data can be used to assess those theories. The course is reading intensive, and evaluation will be based on both written assignments and oral participation.

Prerequisite: 85-221

**85-356 Music and Mind: The Cognitive Neuroscience of Sound**

Intermittent: 9 units

This course will take a multidisciplinary approach to understand the neural systems that contribute to auditory perception and cognition, using music and speech as domains of inquiry. Students will master topics in acoustics, psychophysics, cognitive psychology, cognitive development, neurophysiology, and neuropsychology. The early part of the course will provide students with a common foundation in acoustics, signal processing, and auditory neuroscience. Later in the semester, the focus will turn to developing analytical skills through critical evaluation of primary-source experimental literature. Hands-on laboratories and homework sets in sound manipulation and experimentation also will constitute a means of learning about auditory cognitive neuroscience. Throughout, the focus will be upon understanding general cognitive and perceptual challenges in perceiving and producing complex sounds like speech and music. Topics may include biological vs. cultural influences, development in infancy, perception versus production, time perception, effects of experience on perceptual processing, comparative studies of animals, attention, development of expertise, effects of brain damage, and emotional expression. Topics will be addressed from the perspective of cognitive neuroscience, in that we will attempt to understand the neural processes that give rise to auditory perception and cognition.

Prerequisites: (85-219 or 85-370 or 85-211) and (85-310 or 85-320 or 85-340)

**85-358 Pro-Social Behavior**

Fall: 9 units

This course is an advanced seminar that focuses on social psychological research involving the examination of pro-social behavior. A heavy emphasis will be placed on classic research on helping (which investigates how, when, and why we help strangers), as well as the wide body of literature on social support (which investigates how we help, and seek help from, those who are closer to us). Research on both help-seeking and help-provision will be covered, as well as the implications of this type of pro-social behavior for relationships and health. The course also will cover research on other types of pro-social behavior such as empathy, altruism, forgiveness, and cooperation. This is an advanced seminar in which you will be expected to read original research articles and chapters on assigned topics and come to class prepared to discuss the material. Readings will consist of theoretical and empirical articles from psychology journals and related sources. Additional course requirements will involve short, weekly writing assignments, student presentations of research articles, and a written research proposal. Over the course of the semester, students will design and carry out a small-scale, original investigation on a topic of interest.

**85-362 Seminar on Addiction**

Intermittent: 9 units

This seminar will explore various topics central to the study of drug addiction, with a primary emphasis on psychological and neurobiological theories of drug addiction. We will also discuss research and clinical techniques related to the assessment, diagnosis, and treatment of substance use disorders and related problems. Emphasis will be on alcohol and tobacco, but other drugs will be discussed as well. The main course objective is to provide a unifying model for understanding the fundamental aspects of addiction.

Prerequisites: 85-340 or 85-314 or 85-310 or 85-320

**85-363 Attention, Its Development and Disorders**

Intermittent: 9 units

This seminar is on attention, its development, and disorders. The seminar will discuss a broad range of topics including: theoretical and practical implications of studying attention (for example, is it really dangerous to talk on the cell phone while driving? does listening to music help studying?); interrelationship of attention with other cognitive processes, such as perception and memory; challenges and opportunities for studying attention in infants and young children; biological and psychological foundations of attention disorders. Classes will consist of a combination of lecture and discussion. Students will be expected to read original research articles, participate in class discussions, make presentations based on readings, and complete a written assignment.

Prerequisites: 85-211 or 85-221

**85-370 Perception**

Fall: 9 units

Perception, broadly defined, is the construction of a representation of the external world for purposes of thinking and acting. Although we often think of perception as the processing of inputs to the sense organs, the world conveyed by the senses is ambiguous, and cognitive and sensory systems interact to interpret it. In this course, we will examine the sensory-level mechanisms involved in perception by various sensory modalities, including vision, audition, and touch. We will learn how sensory coding interacts with top-down processing based on context and prior knowledge and how perception changes with learning and development. We will look at methods of psychophysics, neuroscience, and cognitive psychology. The goals include not only imparting basic knowledge about perception but also providing new insights into everyday experiences.

**85-375 Crosscultural Psychology**

Intermittent: 9 units

Human beings share a common genetic inheritance, but our cultural institutions differ in a bewildering variety of ways. This course explores the many different cultural expressions of basic human cognitive and social abilities and needs. We will look at cultural variations in child rearing, mother-child attachment, language socialization, categorization, reasoning, problem-solving, architecture, music, politics, warfare, food-gathering, sex roles, mental disorders, and altered states of consciousness, all with the goal of understanding how the shape of social systems and symbolic expression reflects the economic and adaptive needs of the culture and its people. Among the approaches to these phenomena we will consider are symbolic interaction, cognitive anthropology, dialectic materialism, and modern ethnology.

Prerequisites: 85-251 or 85-261 or 85-100 or 85-102 or 85-198 or 85-211 or 85-219 or 85-221 or 85-241

**85-377 Attitudes and Persuasion**

Intermittent: 9 units

This advanced undergraduate course will focus on the topic of attitude change and how various persuasive techniques are used to shape human response. The dynamics of propaganda and what makes the techniques effective on social and consumer decisions will be addressed. The primary goals of the course are to 1) understand the dynamics of attitude change; 2) explore the mechanism by which attitude change techniques operate and 3) examine relevant theories and research in persuasion. Examples of topics covered include the origins of attitudes, how attitudes influence judgments, social power and attitude change, and how individual decisions are influenced by the mass media. Classic and contemporary research in the area of persuasion will be examined in the form of course readings and assignments.

Prerequisite: 85-241

**85-380 In Search of Mind: The History of Psychology**

Intermittent: 9 units

This course will focus on three aspects of the origin and growth of experimental psychology. The first is the prehistory of psychology, where the connection of the discipline to the development of modern science, and in particular, its origins in philosophy and physiology, is examined. The second focus of the course is on the different approaches and attempts to define the field that have contested for dominance during much of the life of the discipline. The final major focus of the course is on the modern period (roughly the last forty years) where the influences that brought about the modern counter-revolution in psychology will be examined, and where some conjecture about likely future directions will occur. Two prior courses in psychology.

**85-385 Auditory Perception: Sense of Sound**

Intermittent: 9 units

This course explores how our sense of hearing allows us to interact with the world. Students will learn about basic principles of sound, spatial sound, sound quality, hearing impairment, auditory perception, interactions with other modalities, and auditory cognition. Topics may also include musical acoustics, basic auditory physiology, sound-semantic associations, acoustic analysis, and sound-making gestures. We will consider not only simple laboratory-generated signals, but also more complex sounds such as those in our everyday environment, as well music and speech. Students will gain some in-class experience with generating sounds and analytic listening. After students reach a sophisticated level of understanding of the auditory fundamentals, they will apply their knowledge to the study of several current issues in auditory research.

Prerequisites: 85-102 or 85-211

**85-390 Human Memory**

Intermittent: 9 units

Without memory, people would barely be able to function: we could not be able to communicate because we would not be able to remember meanings or words, nor what anyone said to us; we could have no friends because everyone would be a stranger (no memory of meeting anyone); we could have no sense of self because we could not remember anything about ourselves either; we could not predict anything about the future because we would have no recollections of the past; we would not know how to get around, because we would have no knowledge of the environment. This course will discuss issues related to memory at all levels: the sensory registers, i.e., how we perceive things; working or short-term memory; long-term memory or our knowledge base. We will discuss the differences between procedural/skill knowledge, and declarative/fact knowledge. The topics of memory monitoring, feeling and knowing, spread of activation within memory (priming), implicit memory, and amnesia will also be covered.

Prerequisites: 85-211 or 85-213 or 85-340

**85-391 Psychology of Sleep**

Intermittent: 9 units

This course is ONLY offered at Carnegie Mellon in Qatar. This course is an advanced seminar that focuses on the biology, psychology, and social factors of sleep and dreaming. The course will go over the history behind the scientific study of sleep, as well as the cultural and psychological underpinnings of dreaming. Students will also delve into the neuroscience and abnormal psychology of sleep. Emphasis will be placed on reading, presenting and analyzing empirical research articles. Students will also be required to fill out sleep logs and a dream diary, culminating in a final research paper analyzing their semester long sleep patterns and dreams based on research discussed in class.

Prerequisites: 85-211 and 85-102

**85-392 Human Expertise**

Intermittent: 9 units

The process of becoming an expert involves many changes, some quantitative and some qualitative. This course will provide an up-to-date account of the theory and data concerning the development of expertise. Questions addressed include the following. What does it take to become an expert? Are experts born or made? Is the process of acquiring expertise common across different domains from music to sports to science? Research studied in the course will employ a variety of methodologies, from case studies to protocol analysis to computational modeling.

Prerequisites: 85-213 or 85-211

**85-395 Applications of Cognitive Science**

Spring: 9 units

The famous psychologist George Miller once said that Psychology should "give itself away." The goal of this course is to look at cases where we have done so — or at least tried. The course focuses on applications that are sufficiently advanced as to have made an impact outside of the research field per se. That impact can take the form of a product, a change in practice, or a legal statute. The application should have a theoretical base, as contrasted, say, with pure measurement research as in ergonomics. Examples of applications are virtual reality (in vision, hearing, and touch), cognitive tutors based on models of cognitive processing, phonologically based reading programs, latent semantic analysis applications to writing assessment, and measures of consumers' implicit attitudes. The course will use a case-study approach that considers a set of applications in detail, while building a general understanding of what it means to move research into the applied setting. The questions to be considered include: What makes a body of theoretically based research applicable? What is the pathway from laboratory to practice? What are the barriers - economic, legal, entrenched belief or practice? The format will emphasize analysis and discussion by students.

**85-406 Autism: Psychological and Neuroscience Perspectives**

Fall: 9 units

Autism is a disorder that affects many cognitive and social processes, sparing some facets of thought while strongly impacting others. This seminar will examine the scientific research that has illuminated the nature of autism, focusing on its cognitive and biological aspects. For example, language, perception, and theory of mind are affected in autism. The readings will include a few short books and many primary journal articles. The readings will deal primarily with autism in people whose IQ's are in the normal range (high functioning autism). Seminar members will be expected to regularly enter to class discussions and make presentations based on the readings. The seminar will examine various domains of thinking and various biological underpinnings of brain function, to converge on the most recent scientific consensus on the biological and psychological characterization of autism. There will be a special focus on brain imaging studies of autism, including both structural (MRI) imaging of brain morphology and functional (fMRI and PET) imaging of brain activation during the performance of various tasks.

Prerequisites: 85-355 or 85-429 or 85-219 or 85-211 or 85-213

**85-408 Visual Cognition**

Intermittent: 9 units

Recognizing an object, face or word is a complex process which is mastered with little effort by humans. This course adopts a three-pronged approach, drawing on psychological, neural and computational models to explore a range of topics including early vision, visual attention, face recognition, reading, object recognition, and visual imagery. The course will take a seminar format.

Prerequisites: 85-219 or 85-211 or 85-213

**85-412 Cognitive Modeling**

Spring: 9 units

This course will be concerned with modeling of agent behavior in a range of applications from laboratory experiments on human cognition, high-performance simulations such as flight simulators, and video game environments like Unreal Tournament. The first half of the course will teach a high-level modeling language for simulating human perception, cognition, and action. The second half of the course will be a project in which students develop a simulated agent or agents for the application of their choice.

Prerequisites: 15-251 or 15-210 or 15-150 or 15-122

**85-414 Cognitive Neuropsychology**

Spring: 9 units

This course will review what has been learned of the neural bases of cognition through studies of brain-damaged patients as well as newer techniques such as brain stimulation mapping, regional metabolic and blood flow imaging, and attempt to relate these clinical and physiological data to theories of the mind cast in information-processing terms. The course will be organized into units corresponding to the traditionally-defined subfields of cognitive psychology such as perception, memory and language. In each area, we will ask: To what extent do the neurological phenomena make contact with the available cognitive theories? When they do, what are their implications for these theories (i.e., Can we confirm or disconfirm particular cognitive theories using neurological data?)? When they do not, what does this tell us about the parses of the mind imposed by the theories and methodologies of cognitive psychology and neuropsychology?

Prerequisites: 85-211 or 85-219

**85-418 Contributions of Psychological Research to Education**

Intermittent: 9 units

The main goal of this course is for students to learn about what psychological research has to say regarding how to improve education. We will examine basic principles arising out of cognitive and developmental psychology that can inform educational practice; application of these principles to reading, writing, and mathematics; and policy issues, including ones involving universal preschool education, the Common Core State Standards, and whether college inculcates critical thinking skills.

**85-419 Introduction to Parallel Distributed Processing**

Spring: 9 units

This course will provide an overview of parallel-distributed processing models of aspects of perception, memory, language, knowledge representation, and learning. The course will consist of lectures describing the theory behind the models as well as their implementation, and students will get hands-on experience running existing simulation models on workstations.

Prerequisites: 85-211 or 85-213

**85-421 Language and Thought**

Intermittent: 9 units

This course allows the student to explore ways in which the mind shapes language and language shapes the mind. Why are humans the only species with a full linguistic system? Some of the questions to be explored are: What kinds of mental abilities allow the child to learn language? What are the cognitive abilities needed to support the production and comprehension of sentences in real time? How do these abilities differ between people? Are there universal limits on the ways in which languages differ? Where do these limitations come from cognition in general or the specific language facility? Why is it so hard to learn a second language? Are there important links between language change and cultural change that point to links between language and culture?

Prerequisites: 80-150 or 80-180 or 85-211 or 85-213

**85-423 Cognitive Development**

Intermittent: 9 units

The general goals of this course are that students become familiar with the basic phenomena and the leading theories of cognitive development, and that they learn to critically evaluate research in the area. Piagetian and information processing approaches will be discussed and contrasted. The focus will be upon the development of children's information processing capacity and the effect that differences in capacities have upon the child's ability to interact with the environment in problem solving and learning situations.

Prerequisite: 85-221

**85-424 Hemispheric Specialization: Why, How and What?**

Intermittent: 9 units

The brain is divided into two hemispheres, raising a host of questions about brain organization, hemispheric specialization and laterality. Despite all the research devoted to these questions, our understanding of the behavioral significance and neural basis of laterality remains limited. This course will address the questions of "why", "how" and "what". We will review the latest data and empirical results but will also develop a coherent theoretical perspective, moving from molecular, genetic and evolutionary considerations to cognitive and clinical factors in the understanding of one of the most fascinating phenomena in neuroscience, neuropsychology, psychiatry, neurology, and cognitive sciences. In addition to tackling a major text in the field (The Two Halves of the Brain Edited by Hugdahl and Westerhausen), we will read the latest papers in the field. The class will be almost entirely discussion-based and students will be responsible for doing the readings ahead of time and being prepared for the discussion.

Prerequisites: 85-251 or 85-221 or 85-241

**85-425 Child Psychopathology and Treatment**

Intermittent: 9 units

The first half of this course will focus on understanding the etiology and epidemiology of child and adolescent psychopathology. Special emphasis will be placed on conditions that are first diagnosed during childhood (e.g., ADHD, Autism, Eating Disorders) as well as understanding how child and adult psychopathology differ. The second half of this course will focus on treatment interventions for youth with psychopathology. Students will learn about how interventions for adults with psychopathology are altered to be developmentally appropriate for children, and methods of intervention commonly used with children but less so with adults (e.g., family therapy, play therapy). For students who have completed abnormal psychology and the psychology breadth requirement but not the other course pre-requisite, 85102, please see Theresa Kurutz to register for this course in BH 343.

Prerequisites: 85-102 and 85-261

**85-426 Learning in Humans and Machines**

Spring: 9 units

This course explores how probabilistic methods can help to explain cognition and to develop intelligent machines. The applications discussed include perception, language, memory, categorization, reasoning, decision-making, and motor control.

Prerequisite: 15-112

**85-429 Cognitive Brain Imaging**

Spring: 9 units

This seminar will examine how the brain executes higher level cognitive processes, such as problem-solving, language comprehension, and visual thinking. The topic will be addressed by examining what recent brain imaging studies can tell us about these various kinds of thinking. This new scientific approach has the potential of providing important information about how the brain thinks, indicating not only what parts perform what function, but also how the activity of different parts of the brain are organized to perform some thinking task, and how various neurological diseases (e.g. aphasia, Alzheimer's) affect brain activity. A variety of different types of thinking will be examined, including short-term working memory storage and computation, problem solving, language comprehension, visual thinking. Several different technologies for measuring brain activity (e.g. PET and functional MRI and also some PET imaging) will be considered, attempting to relate brain physiology to cognitive functioning. The course will examine brain imaging in normal subjects and in people with various kinds of brain damage.

Prerequisites: 85-211 or 85-213 or 85-412 or 85-414 or 85-419

**85-442 Health Psychology**

Intermittent: 9 units

This course is concerned with how behavior and psychological states influence the development of and recovery from disease. The class provides an overview of existing psychological and epidemiological data on the relationship between behavior and disease and addresses the issue of how behavior, emotion and cognition can influence the disease processes. Topics include: measures and concepts, stress and disease, stress and coping, personal control, helplessness and disease, social support and health, reactivity to stress, behavior and hypertension, coronary heart disease, infectious diseases and immune function, and the effectiveness of behavioral interventions in health. Only Juniors and Seniors will be admitted into the course and instructor permission is required.

**85-443 Social Factors and Well-Being**

Intermittent: 9 units

This course will focus on the role that our social environment plays in our feelings of well-being and in the maintenance of our mental and physical health. Topics to be discussed include marriage, widowhood, loneliness, social support, social participation, social aspects of personality (e.g., social anxiety, extraversion, agreeableness, and hostility), social stressors (betrayal and conflict), discrimination, and socioeconomic status. We will consider how each social factor develops, the extent to which we can alter it or its effects on our lives, and how it influences our overall well-being. Only Juniors and Seniors will be admitted into the course and instructor permission is required.

**85-444 Relationships**

Fall: 9 units

The primary goal of this course is to introduce you to social psychological theory and research on the topic of relationships. Although a variety of relationship phenomena will be discussed, a heavy emphasis will be placed on research that addresses fundamental processes in close relationships. The coverage of material will include a review of historical roots and classic approaches to the scientific study of relationships, as well as exciting new research and theory on particular subtopics. The majority of class time is spent discussing and evaluating recent research. Special emphasis also is given to learning and critically evaluating the methodological tools that are used to study close relationships. The goal is for students to leave this course with a broad overview of the field and an in-depth understanding of particular subtopics. This is an advanced seminar in which students will be expected to read original research articles and chapters on assigned topics and come to class prepared to discuss the material. Readings will consist of theoretical and empirical articles from psychology journals and related sources. Additional course requirements will involve short, weekly writing assignments, student presentations of research articles, and a written research proposal. Over the course of the semester, students will design and carry out a small-scale, original investigation on a relationships topic of interest.

Prerequisite: 85-340

**85-446 Psychology of Gender**

Spring: 9 units

This course is devoted to the investigation of psychological gender rather than biological sex. That is, sex differences will be explored from a social psychological (e.g., socialization) perspective. Implications of both male gender role and female gender role in the areas of relationships and health will be the course focus.

Prerequisites: 85-241 or 85-251

**85-480 Internship in Clinical Psychology**

All Semesters

This course introduces students to Clinical Psychology and related mental health fields. Students' learning is facilitated through classroom-based activities and by learning about clinical research and/or practice in designated field settings. Students spend 3 hours per week in class and 6 hours per week in an applied or research setting. Please contact Dr. Beth Zimick if you are interested in enrolling at [bethc@andrew.cmu.edu](mailto:bethc@andrew.cmu.edu). Prerequisites: 85-251 or 85-261

**85-481 Seminar in Intervention**

Intermittent: 9 units

This course is an introduction to the therapeutic process. Students will be introduced to a variety of therapeutic approaches and techniques (e.g. Solution-Focused, Cognitive, Client Centered, etc.) and will have the opportunity to learn the basic skills associated with each (e.g. Cognitive Restructuring, Mirroring, Empathic Highlighting, etc.). Instruction will entail a mix of discussion and demonstration, and there will be a heavy emphasis on in-class practice of these skills.

Prerequisites: (85-251 and 85-261) or (85-261 and 85-281) or (85-251 and 85-281)

**85-482 Internship in Psychology**

Fall and Spring

The Internship in Psychology is designed to enable students to gain experience in professional settings related to their studies in Psychology and earn credit for the intellectual work involved. It is the students' responsibility to locate an internship site and on-site supervisor, as well as to identify a CMU faculty sponsor. The student registers for the internship by submitting a completed internship form to Theresa Kurutz in Baker Hall 343.

**85-484 Practicum in Child Development**

Fall and Spring

This guided field experience is designed to help students deepen their understanding of developmental psychology by assisting in a preschool or kindergarten classroom and discussing the ways that their experiences relate to the theories they have learned previously and to new readings. Each student will individually schedule a consistent 6 hours per week helping in a Children's School classroom (preferably 2 or 3 chunks of time). Classroom duties will include working one-on-one and with small groups of students as they do puzzles, art projects, dramatic play, etc., as well as helping with snack, playground supervision, classroom cleanup, and storytime. Each student will be expected to keep a journal 1) relating general experiences to developmental theories and 2) documenting the development of a particular child during the semester. All students will meet for a 1 hour weekly discussion with the director. Discussion topics and related readings will be selected collaboratively, based on issues/questions raised by the group's observations and discussions. This course is typically 9 units, but may be negotiable between 3 and 9.

Prerequisite: 85-221

**85-501 Stress, Coping and Well-Being**

Intermittent: 9 units

This course will examine basic processes and theory about stress and coping from a psychological perspective. The first part of the course will explore topics related to the psychobiology of stress, stress measurement, and links between stress and health. The second part of the course will explore topics on mechanisms and theoretical perspectives on coping with stress. This will include a consideration of topics such as emotion regulation, self-regulation, coping with traumatic events, alternative medicine approaches, and resilience factors. This class is a small, upper level seminar that will consist of some lecture and extensive class discussion. Active class participation is required.

Prerequisites: 85-310 or 85-320 or 85-340

**85-505 Readings In Psychology**

All Semesters

As the name implies, the emphasis in the Reading course is on reading articles and books in some specified area. The students work in the course must lead to the production of a written paper which will be read by the instructor directing the readings. Often the reading is related to a research project which the student may wish to conduct. Readings courses have also been used to give students an opportunity to receive instruction in areas which are not included elsewhere in our course listing. The course may be taken for any number of units up to 9, depending upon the amount of work to be done.

**85-506 Readings in Psychology**

Fall and Spring

As the name implies, the emphasis in the reading course is on reading articles and books in some specified area. The students work in the course must lead to the production of a written paper which will be read by a psychology faculty instructor directing the readings. Often the reading is related to a research project which the student may wish to conduct. Reading courses have also been used to give students an opportunity to receive instruction in areas which are not included elsewhere in our course listing. The course may be taken for any number of units up to 9, depending upon the amount of work to be done. This course is special permission and can only be added in consultation with a psychology faculty member and registered by the Undergraduate administrator, Emilie O'Leary [emilier@andrew.cmu.edu](mailto:emilier@andrew.cmu.edu).

**85-507 Research in Psychology**

Fall

This course may include field study, applied work, or laboratory research. The student should have previous training in the basic research skills that will be used in his/her project, especially statistical methods and experimental design. Independent Research Projects will be supervised by a faculty member and must result in a written paper. It is the students' responsibility to make arrangements for independent study courses with individual faculty members. This should be done the semester before a student wishes to register for one of these courses. The course may be taken for any number of units up to 12, depending upon the amount of work to be done. Please contact the CMU psychology faculty member you wish to work with to get approval to enroll then email Emilie Rendulic at [emilier@andrew.cmu.edu](mailto:emilier@andrew.cmu.edu) in order to be registered for the course.

**85-508 Research in Psychology**

Spring

This course may include field study, applied work, or laboratory research. The student should have previous training in the basic research skills that will be used in his/her project, especially statistical methods and experimental design. Independent Research Projects will be supervised by a faculty member and must result in a written paper. It is the students' responsibility to make arrangements for independent study courses with individual faculty members. This should be done the semester before a student wishes to register for one of these courses. The course may be taken for any number of units up to 12, depending upon the amount of work to be done.

**85-601 Senior Thesis**

Fall: 9 units

This course is intended for senior Psychology or Cognitive Science majors who wish to conduct a research project under the direction of a faculty advisor. The project topic is to be selected jointly by the student and the advisor. The project will culminate in a senior paper which will be presented to the Department Head at the end of Fall Semester. Prerequisite: Grade of B or better in a previous research course required to enter, grade of B or better in first semester of senior thesis course required to complete, and permission of instructor. A formal proposal is required in the first semester. This course differs from the Honors Thesis sequence (66-501,502) in that it does not require Honors standing in HSS (i.e., there are no QPA requirements). This course differs from Research in Psychology (85-507,508) in that the student's original contribution to the research is expected to be more substantial, and in that a final written report of the project is to be presented to the Department.

**85-602 Senior Thesis**

Spring: 9 units

This course is intended for senior Psychology or Cognitive Science majors who wish to conduct a research project under the direction of a faculty advisor. The project topic is to be selected jointly by the student and the advisor. The project will culminate in a senior paper which will be presented to the Department Head at the end of Fall Semester. Prerequisite: Grade of B or better in a previous research course required to enter, grade of B or better in first semester of senior thesis course required to complete, and permission of instructor. A formal proposal is required in the first semester. This course differs from the Honors Thesis sequence (66-501,602) in that it does not require Honors standing in HSS (i.e., there are no QPA requirements). This course differs from Research in Psychology (85-507,508) in that the student's original contribution to the research is expected to be more substantial, and in that a final written report of the project is to be presented to the Department.

**85-730 Analytic Research Methods**

Intermittent: 12 units

This class will teach students how to apply six major non-experimental research methods used in analytic behavioral analysis. Protocol Analysis. This method is used to study patterns and changes in problem-solving and their matches to theoretical models, including computational models. Corpus Analysis. This method is used to isolate patterns of behavioral and communication usage and change, as revealed through the study of the world-wide web and large computerized databases such as CHILDES, TalkBank, or the British National Corpus. Tools here include text searches and data-mining. Conversation Analysis. This is a microanalytic method used to examine sequencing, repair, and orientation in closely transcribed recordings of spoken interactions, as made available through systems such as the CABank database, as well as recorded programs on YouTube and elsewhere. Coding Systems. This approach seeks to capture interactional and behavioral structures in writing, teaching, interview, and other interactions. Here, there will be a special emphasis on the coding of instructional interactions. Gesture Analysis. This microanalytic method seeks to track patterns in gestural and nonverbal communication, often in association with spoken messages. Profile Analysis. This approach studies differences across learners at various ages and ability levels and group differences involving aphasia, autism, stuttering, dementia, and other individual differences. Students will work with data already available from previous studies, and will also learn to collect their own new datasets. Although the data being examined have been generated through naturalistic processes, they can be analyzed quantitatively using time-series analyses, non-parametric statistics, error matrices, and neural network simulations. In these various analyses, we will also consider how behavioral patterns are shape

**85-753 Mindfulness: Science and Practice**

Intermittent

This course will focus on blending first-person experience with mindfulness practices (including mindfulness meditation) and learning about the scientific research on mindfulness. Students will engage in guided mindfulness exercises, develop a daily mindfulness practice, and try out different mindfulness training traditions. In addition, much of this course will be focused on applying a critical eye to the theory, measures, mechanisms, and effects of mindfulness (and mindfulness training interventions) across multiple domains cognition, social processes, behavior, biological mechanisms, and health. As such, this will be a small seminar course focused developing first-person experiences of mindfulness and on discussing the debates and opportunities related to the emerging science of mindfulness.

**85-762 Seminar on Addiction**

Fall: 9 units

This seminar will explore various topics central to the study of drug addiction, with a primary emphasis on psychological and neurobiological theories of drug addiction. We will also discuss research and clinical techniques related to the assessment, diagnosis, and treatment of substance use disorders and related problems. Emphasis will be on alcohol and tobacco, but other drugs will be discussed as well. The main course objective is to provide a unifying model for understanding the fundamental aspects of addiction.

**85-765 Cognitive Neuroscience**

Intermittent

This course will cover fundamental findings and approaches in cognitive neuroscience, with the goal of providing an overview of the field at an advanced level. Topics will include high-level vision, spatial cognition, working memory, long-term memory, learning, language, executive control, and emotion. Each topic will be approached from a variety of methodological directions, for example, computational modeling, cognitive assessment in brain-damaged humans, non-invasive brain monitoring in humans, and single-neuron recording in animals. Lectures will alternate with sessions in seminar format. Prerequisites: Graduate standing or two upper-level psychology courses from the areas of developmental psychology, cognitive psychology, computational modeling of intelligence, neuropsychology or neuroscience.

**85-851 Personality and Health**

Intermittent

The general purpose of this course is to examine possible connections between personality and physical well-being. Material will be presented at the outset of the semester that is designed to enable students to understand more fully how psychologists think about the concept of personality (what it is and what it does for us), how it is assessed, and how personality and health psychologists do research on the topic. As the semester progresses, we will explore and discuss research that links certain aspects of personality to health, illness, and mortality. The list of personality characteristics to be considered includes (but is not necessarily limited to) optimism/pessimism, conscientiousness, hostility, trait positive and negative affect, life purpose, and chronic goal adjustment strategies. As time permits, select person variables will also be considered, e.g., the impact of depressive mood on health. Class time will be largely taken by discussion of original research papers. Different sets of students will be responsible for leading these discussions. Grades will be based on a combination of class participation, quality of paper presentations, and performance on a final research paper.