

## 2016 Spring Course Offerings

# Cognitive Science

Director: Professor Barbara Malt



Declaration forms are available at the Office of Interdisciplinary Programs: 31 Williams Hall, Suite 101

## INTRODUCTORY COURSE

### **COGS 007-10 Introduction to Cognitive Science** (SS) 4 credits

What is a mind? How is the mind related to the brain? Could we make an artificial mind? Issues concerning knowledge representation and intelligence in minds and computers as investigated by psychologists, philosophers, linguists, neuroscientists, and researchers in artificial intelligence. **Professor Malt** M, W; 2:35 - 3:50 p.m.

## DISCIPLINARY CORE COURSES

### **COGS, PSYC 176-10 Cognitive Neuroscience** (NS) 4 credits

Perception and cognitive neuroscience as the link between mental processes and their biological bases. Visual and auditory perception; the control of action; neuropsychological syndromes of perception, language, memory, and thought; neural network (connectionist) models of mental processes. Prerequisite: PSYC 1 or COGS 7. May not be taken pass/fail. *Prerequisite PSYC 001 or COGS 007.*

**Professor Hupbach** T, R; 2:35 - 3:50 p.m.

### **COGS, CSE 327-10 Artificial Intelligence Theory and Practice** (ND) 3 credits

Introduction to the field of artificial intelligence: Problem solving, knowledge representation, reasoning, planning and machine learning. Use of AI systems or languages. Advanced topics such as natural language processing, vision, robotics, and uncertainty. Prerequisite: CSE 015 or CSE 017 or CSE 018 or CSE 002 *Prerequisite (CSE 001 and CSE 002) or CSE 017. CSE 261 is recommended.* **Professor Heflin** T, R; 1:10 - 2:25 p.m.

## MAJOR ELECTIVES

### *Artificial Intelligence and Formal Models*

### **PHIL, MATH 114-10 Symbolic Logic** (MA) 4 credits

A first course in logical theory, introducing the notions of logical consequence and proof, as well as related concepts such as consistency and contingency. Formal systems taught may include: term logic, sentence logic, and predicate logic. **Professor Schmidt** M, W; 12:45 - 2:00 p.m.

### *Language, Culture, and Meaning*

### **PHIL 220-10 Theory Of Knowledge** (HU) 4 credits

Recent work in epistemology. Questions addressed include: If you can't know whether you are dreaming, how can you know you have two hands? Does knowledge require answers to all possible doubts or only all reasonable doubts? How should we determine the horizon of the reasonable—psychologically or philosophically? Must have completed one HU-designated course in Philosophy at 100-level or higher. **Professor Bearn** T, R; 10:45 - 12:00 p.m.

### **PSYC, HMS 344-10 Health Care Reasoning and Decision-Making** (SS) 4 credits

Health care professionals diagnose physical and mental illnesses and create treatment plans to improve their patients' health. How do these professionals make decisions related to these important issues? We will explore the literature on how medical and mental health professionals reason and make decisions about health care issues. Topics to be covered include diagnosis, treatment decisions, access to care, and how these reasoning processes are swayed. Consideration will be given to patient decision-making as well. Prerequisite: PSYC 117 or PSYC 176 or COGS 7 or consent of instructor. Department permission required. *Permission by Psychology Department required.*

**Professor Marsh** M, W; 12:45 - 2:00 p.m.

### ***Additional courses that can be petitioned for elective credit***

#### **SOC 302-10/402-10 The Sociology Of Cyberspace** (SS) 4 credits, 3 credits

An examination of social life on the Internet and the World Wide Web. Topics may include sociocultural and psychological aspects of communication in cyber-environments (e.g., email, chat rooms, news groups, MUDS, etc.), interpersonal relationships and group development, the nature of community, the politics of cyberspace (control and democracy), privacy and ethics, and economic dimensions. Examination of past and current case studies. **Professor Stanlick T, R; 9:20 - 10:35 a.m.**

#### **COGS, PSYC, PHIL 395-10 Pragmatism, Mind, and Development: From Peirce to Piaget** (HU) 4 credits

The study of mind since the ancient Greeks has been dominated by a visual metaphor of passively 'looking' at, or receiving from, the world. This yields the metaphors of signet rings pressing their forms into wax, blank slates which the world writes on, and more contemporary versions such as transduction, induction, and the reception of associations. This framework still dominates in philosophy and in psychology, including developmental psychology, but it encounters serious, even fatal, problems, and no one has ever been able to solve or resolve them. There is, however, a more 'recent' alternative that is attracting growing attention, again both in philosophy and in psychology — action and interaction based models. These were introduced by Peirce in the late 1800s (inspired in many ways by Darwin), and have entered philosophy via Pragmatism in its various forms, and psychology via action-based models of perception, cognition, language, etc. — and in developmental psychology via the influence of Piaget. (Piaget was considered during the 80s and into the 90s to have been refuted and superseded, but it is now increasingly recognized that it is the critics of Piaget who have been in error.) Action and interaction based models arguably avoid the problems of passive mind models, and enable conceptually and empirically more successful theories and methods. This course will survey these issues, and explore some of the versions and consequences of the shift to action-based, pragmatist, models for mind, epistemology, language, cognition, developmental psychology, and other domains of psychology and philosophy. *Department permission required.* **Professor Bickhard M; 1:10 - 4:00 p.m.**

## **SENIOR THESIS**

#### **COGS 301 Senior Project in Cognitive Science: Proposal** (ND) 3 credits

Senior year integration of the material from cognitive science begins with the proposal of a substantial review or research project spanning at least two cognitive science disciplines under the direction of a Cognitive Science faculty member. *Instructor permission required.*

## **ADDITIONAL COURSES**

#### **COGS 161-10-22 Supervised Research** (ND) 2-4 credits

Research under the direct supervision of a faculty member in the cognitive science program. Students must arrange the particular project with a faculty member before enrolling. *Instructor permission required.* **Professor Malt**

#### **COGS 361 Independent Research** (ND) 2-4 credits

Independent research in cognitive science with a faculty advisor. Students must arrange the particular project with a faculty advisor before enrolling. *Instructor permission required.* **Professor Malt**

#### **COGS 399-10-23 Senior Project in Cognitive Science: Thesis** (ND) 3 credits

Research during senior year culminating in senior thesis advised by a member of the Cognitive Science faculty. Execution and written report of project proposed and approved in COGS 301. Theses submitted for honors will be evaluated by a committee of at least three cognitive science faculty. Prerequisite: COGS 301. *Instructor permission required.* **Professor Malt**

#### **COGS 405-10-22 Individual Study in Cognitive Science** (ND) 1-6 credits

Study of a topic not covered in regular course offerings. By arrangement with a consulting faculty member. May be repeated for credit. *Instructor permission required.* **Professor Malt**

## **COLLATERAL REQUIREMENTS**

#### **CSE 012 Fundamentals of Programming** (ND) 2 credits

Multiple Sections available, refer to on-line course schedule

#### **MATH 021-Multiple Sections Calculus I** (MA) 4 credits

Multiple Sections available, refer to on-line course schedule

#### **MATH 051-Multiple Sections Survey of Calculus** (MA) 4 credits

Multiple Sections available, refer to on-line course schedule