Las Positas College
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Course Outline for PSYC 27

INTRODUCTION TO COGNITIVE SCIENCE

Effective: Fall 2018

I. CATALOG DESCRIPTION:
PSYC 27 — INTRODUCTION TO COGNITIVE SCIENCE — 3.00 units

An introduction to the interdisciplinary field of cognitive science. Basic issues related to cognition, including perception, memory, language, learning, problem solving, spatial cognition, attention, mental imagery, consciousness, brain damage, development, and artificial intelligence, are considered from the perspectives of psychology, philosophy, computer science, and neuroscience.

3.00 Units Lecture

Grading Methods:
Letter or P/NP

Discipline:
- Psychology

	MIN
Lecture Hours:	54.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Differentiate the theoretical frameworks in cognitive science, including neuroscience, psychology, philosophy, linguistics, and artifical inteliigence;
B. Contrast the various methodological approaches used in cognititve science
C. Critically evaluate research findings in cognitive science, including perception, attention, learning, memory, reasoning, problem-solving, judgment, and decision-making;
D. Assess the limitations of each theoretical framework in explaining cognition and human behavior
E. Describe the common cognitive biases and errors

V. CONTENT:
A. Exploring the inner space of the mind
    1. Representation
    2. Computation
    3. Interdisciplinary perspective
B. The philosophical approach
    1. The Mind-Body problem
    2. The Knowledge Acquisition problem
    3. The mystery of consciousness
C. The psychological approach
    1. The scientific method in psychology
    2. Structuralism, functionalism, and gestalt psychology
D. The cognitive approach
    1. Vision
    2. Pattern recognition
    3. Attention
    4. Memory
    5. Imagery
    6. Problem-solving
E. The neuroscience approach
    1. Methods of study in neuroscience
    2. Brain anatomy and function
    3. Neuron anatomy and function
F. The network approach
    1. Neural networks
    2. Network science
G. The evolutionary approach
    1. Evolutionary psychology

2. Behavioral economics

H. The linguistics approach
   1. Nature of language
   2. Language acquisition

I. The emotion approach
   1. Measuring emotion
   2. Affective neuroscience

J. The social approach
   1. Social cognition
   2. Disorders of social cognition

K. The artifical intelligence approach
   1. History of AI research
   2. Fuzzy logic

L. Intelligent agents and robots
   1. Intelligent agent paradigm
   2. New developments in models of AI

VI. METHODS OF INSTRUCTION:

A. **Simulations** - of classic studies in cognitive science
B. **Audio-visual Activity** - use of projector and video clips to reinforce course concepts
C. **Written exercises and case studies** -
D. **Research** - of literature in cognitive science
E. **Lecture** - supported by visual materials and use of whiteboard
F. **Discussion** - of controversial or current topics in small groups

VII. TYPICAL ASSIGNMENTS:

A. Lectures
   1. Social cognition
      a. Fundamental attribution error
      b. Cognitive dissonance
      c. Actor-observer bias

B. Reading
   1. Read chapter 11 The Social Approach: Mind as Society in Friedenberg and Silverman.

C. Collaborative learning
   1. Share a time when you experienced cognitive dissonance. Explain what steps you took to remove the dissonance.

D. Presentation
   1. Select one research study in cognitive science from the library databases. Prepare a short (3-5 min) presentation about the hypothesis and findings of the study.

VIII. EVALUATION:

A. **Methods**

   1. Exams/Tests
   2. Research Projects
   3. Class Participation
   4. Class Work

B. **Frequency**

   1. 2-3 exams
   2. 1 research project
   3. Daily class participation
   4. Weekly class work

IX. TYPICAL TEXTS:

1. Thagard, Paul. *Mind: Introduction to Cognitive Science.* 2nd ed., MIT Press, 2005.
2. Bermudez, Jose . *Cognitive science: An introduction to the science of the mind.* 2nd ed., Cambridge University Press, 2014.
3. Goldstein, E. *Cognitive psychology: Connecting mind, research and everyday experience.* 4th ed., Cengage Publishing, 2015.
4. Sternberg, Robert. *Cognitive Psychology.* 7th ed., Cengage Publishing, 2017.
5. Abbott, A "Row hits flagship brain plan." Nature Volume 511 2014.
6. Adams, F. "Why we still need a mark of the cognitive." Cognitive Systems Research Volume 11 2010.
7. Marshall, P. J. "Relating psychology to neuroscience: Taking up the challenge." Perspectives in Psychological Science Volume 4 2009.
8. Dobbs, D. "FMRI: Fact or Phrenology?." Scientific American Mind Volume 16 2005.
9. Carr, N. "What the internet is doing to our brains: Is google making us stupid?." The Atlantic Monthly Volume 302 2008.
10. Miller, G. A. "Mistreating psychology in the decades of the brain.." Perspectives on Psychological Science Volume 5 2010.

X. OTHER MATERIALS REQUIRED OF STUDENTS: