

T R A N S M I T T A L

**DATE:** April 22, 2004

**TO:** Rebecca Scott  
Senate Council

**FROM:** Lissa Holland  
Graduate Council

The Graduate Council met on March 25, 2004 and approved the following:

COLLEGE OF RTS & SCIENCES

**New Course**

**CGS 500 Cognitive Science in Theory and Practice (3 credits)**

This course will introduce upper-level undergraduate students (and lower-level graduate students) to Cognitive Science, an interdisciplinary field that seeks to study the mind from the perspective of various disciplines: Biology, Computer Science, Linguistics, the Neurosciences, Philosophy, and Psychology. The course will consist of modules in at least four of these six disciplines.

***Prerequisites:*** Upper-class standing.

**UNIVERSITY OF KENTUCKY  
APPLICATION FOR NEW COURSE**

Submitted by **College of Arts and Sciences** Date **August 2003**

Department/Division offering course: **College of Arts and Sciences**

2. Proposed designation and Bulletin description of this course:

(a) Prefix and Number **CGS 500** (b) Title\* **Cognitive Science in Theory and Practice**  
\*NOTE: If the title is longer than 24 characters (including spaces), write  
a sensible title (not exceeding 24 characters) for use in transcripts: **Cog Sci in Theory & Prac**

(c) Lecture/Discussion hours per week **3** (d) Laboratory hours per week **0**

(e) Studio hours per week **0** (f) Credits **3**

(g) Course description: **This course will introduce upper-level undergraduate students (and lower-level graduate students) Cognitive Science, an interdisciplinary field that seeks to study the mind from the perspective of various disciplines: Biology, Computer Science, Linguistics, the Neurosciences, Philosophy, and Psychology. The course will consist of modules in at least four these six disciplines. Prerequisites: upper class standing.**

(h) Prerequisites (if any): **upper class standing.**

(i) May be repeated to a maximum of **\_\_** credits. **N/A**

4. To be cross-listed as:

Prefix & No. Signature, Chairman, cross-listing department

5. Effective Date: **Fall 2004** (semester and year)

6. Course to be offered (a) **Fall** (b) **Spring** (c) **Summer**

7. Will the course be offered each year? (a) **Yes** (b) **No**  
(Explain if not annually):

8. Why is this course needed. **The UK course offerings presently has no course on Cognitive Science on its books. This is a glaring omission: Cognitive Science, as an interdisciplinary field aimed at studying the mind from the perspective of the various disciplines mentioned above, is one of the more important and exciting interdisciplinary fields to emerge in the last forty years. It is for this reason that almost two thirds of the SEC universities and our benchmarks have course offerings in Cognitive Science. (See attached sheet.) What is more, the UK faculty currently have more than fifteen members whose work bears directly on Cognitive Science, all of whom have expressed an interest in seeing this course taught and a willingness to teach it (or to teach a module within it). So UK has the resources to teach this course as well.**

9. (a) By whom will the course be taught? **It will be taught by various people, from various departments, on a rotating basis. Among those who will teach it (and their affiliation) are: Sanford Goldberg (Philosophy); Greg Stump (Linguistics/English); Jane Joseph (Anatomy and Neurobiology); Robert Lorch (Psychology); Lawrence Gottlob (Psychology); Thomas Zentall (Psychology); Judy Goldsmith (Computer.Science); Jeanmarie Rouhier-Willoughby (Linguistics/Russian); Hong Yan (Biology)**

**In addition, various individuals have expressed a willingness (and indeed an interest) in teaching course modules in the class, according to their specialization. These include Rafael Finkel (Computer Science); Yang Jiang (Behavioral Science); Bradley Monton (Philosophy); Lisa Zunshine (English); Anna Bosch (Linguistics/English); Harmon Holcomb (Philosophy); Jonathan Golding (Psychology); Ronald Bruzina (Philosophy).**

(b) Are facilities for teaching the course now available? (a) **Yes** (b) **No**  
If not, what plans have been made for providing them?

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10. What enrollment may be reasonably anticipated? 25
11. Will this course serve students in the Department primarily? (a) Yes (b) No  
 Will it be of service to a significant number of students outside the Department? (a) Yes (b) No  
 If so, explain:  
**It is aimed at anyone (from any department) interested in Cognitive Science, but it will be particularly useful to students from the main departments listed above (Biology, Computer Science, Linguistics, the Neurosciences, Philosophy, and Psychology).**
- Will the course serve as a University Studies Program course? (a) Yes (b) No  
 If yes, under what Area?
12. Check the category most applicable to this course:  
 \_\_\_X\_\_\_ traditional; offered in corresponding departments elsewhere;  
           relatively new, now being widely established  
           not yet to be found in many (or any) other universities
13. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky? (a) Yes (b) No
14. Is this course part of a proposed new program? (a) Yes (b) No  
 If yes, which? **Undergraduate Minor in Cognitive Sciences**  
**Graduate Certificate in Cognitive Sciences**
15. Will adding this course change the degree requirements in one or more programs? (a) Yes (b) No  
 If yes, explain the change(s) below:
16. Attach a list of the major teaching objectives of the proposed course, outline and/or reference list to be used.  
 (See attached Syllabus)
17. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.
18. Within the Department, who should be contacted for further information about the proposed course?  
 Name/e-mail: **Sandy Goldberg scgold@uky.edu** Phone Extension: **257-6540**

\*NOTE: Approval of this course will constitute approval of the program change unless other program modifications are proposed.

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Signatures of Approval:

_____ Department Chair <i>David Leep</i> _____ Dean of the College	_____ Date DEC 02 2003 _____ Date SEP 30 2003 _____ Date of Notice to the Faculty <i>3-2-04</i> _____ Date
_____ <i>Bruce Huges</i> _____ *Undergraduate Council	_____ Date
_____ *University Studies	_____ Date
_____ *Graduate Council	_____ Date
_____ *Academic Council for the Medical Center	_____ Date
_____ *Senate Council (Chair)	_____ Date of Notice to Univ. Senate

\*If applicable, as provided by the Rules of the University Senate

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ACTION OTHER THAN APPROVAL:

## CGS 500 “Cognitive Science in Theory and Practice”

A tentative syllabus  
Proposed by S. Goldberg, Philosophy

**Course Objectives.** This course aims to provide upper-level undergraduates and interested graduate students with an introduction to Cognitive Science, an interdisciplinary field studying the human and animal mind. (The disciplines involved include Biology, Computer Science, Neuroscience [including Neuroanatomy and/or Neurology], Linguistics, Philosophy, and Psychology). To this end the course will aim (1) to introduce students to each of the contributing disciplines’ contribution to Cognitive Science; and (2) to enable students to characterize in broad outline at least one of the current research programs within Cognitive Science, and to evaluate the success of that research program to date.

**Student Learning Outcomes.** Upon completion of this course the student should be able to:

- (i) identify the subject-matter and interdisciplinary nature of Cognitive Science;
- (ii) characterize the contributions to Cognitive Science of at least four of the six disciplines listed above; and
- (iii) characterize at least one of the current research programs within Cognitive Science, and evaluate the success of that research program to date.

**Evaluation** will be by two exams (mid-term and final) and one term paper (undergraduates: 5-7 pages; graduate students: 15-20 pages). The grading will reflect how well the student has mastered the material, as determined by (1) the quality of the students’ characterization of the relevant issues and debates on the exams; (2) the familiarity exhibited by the student of the various positions discussed in the readings and in class; and (3) the reasoning behind the student’s own views, and her/his ability to address in a critical way the issues presented in class, as manifested primarily in her/his term-paper.

Undergraduates will be required to have mastered the material well enough to characterize the various issues and debates, and to do some critical assessment of these issues and debates.

Graduate students will be expected to exhibit a greater amount of critical assessment.

Grading will be on the following scale:

90-100%:	A
80-89%:	B
70-79%:	C
60-69%:	D
Below 60%:	F

**Texts.**

- Cognitive Science: An Introduction. Stillings, Weisler, Chase, Feinstein, Garfield, Rissland, eds. (Cambridge, Mass: MIT Press, 1995). [Henceforth CSI]  
An Invitation to Cognitive Science, Volume 1: Language (Second Edition) Gleitman and Liberman, eds. (Cambridge, Mass: MIT Press, 1995). [Henceforth ICS-L]  
An Invitation to Cognitive Science, Volume 2: Visual Cognition (Second Edition) Kosslyn and Osherson, eds. (Cambridge, Mass: MIT Press, 1995). [Henceforth ICS-VC]  
An Invitation to Cognitive Science, Volume 3: Thinking (Second Edition) Smith and Osherson, eds. (Cambridge, Mass: MIT Press, 1995). [Henceforth ICS-T]

**Course Schedule** (to be modified according to instructor's strengths, interests)

*[Please note: the following is much too long for a one-semester course. It will be modified to suit the instructor's interests and strengths. The only thing that will be insisted upon is that at least four of the following 7 modules be taught – but it is up to the instructor how many, and which ones, to teach. It is also up to the instructor to ensure that there will not be too much material for a one-semester course. In so modifying the course, the instructor will presumably choose from among the following texts, although she is of course free to include her own materials as well.]*

**MODULE 1: INTRODUCTION TO COGNITIVE SCIENCE**

Readings: CSI, Chapter 1 (“What is Cognitive Science?”)

**MODULE 2: THE PSYCHOLOGY OF COGNITION**

*Introduction*

Readings: CSI, Chapter 2 (“Cognitive Psychology: The Architecture of the Mind”); CSI, Chapter 3 (“Cognitive Psychology: Further Explorations”);

Guest lectures by: Robert Lorch

*Concepts and Reasoning*

Readings: ICS-T, Chapter 1 (Smith, “Concepts and Categorization”); ICS-T, Chapter 2 (Osherson, “Probability Judgment”); ICS-T, Chapter 3, (Sharif and Tversky, “Decision Making”); ICS-T, Chapter 4 (Carey, “Continuity and Discontinuity in Cognitive Development”); ICS-T, Chapter 5 (Atran, “Classifying Nature Across Cultures”).

Guest lectures by: Ramesh Bhatt, Kert Viele

*Problem Solving and Memory*

Readings: ICS-T, Chapter 7 (Jonides, “Working Memory and Thinking”); ICS-T, Chapter 8 (Holyoak, “Problem Solving”); ICS-T, Chapter 10 (Schwarz (“Social Cognition: Information Accessibility and Use in Social Judgment”)

Guest lectures by: Jonathan Golding

**MODULE 3: ARTIFICIAL INTELLIGENCE**

Readings: CSI, Chapter 4 (“Artificial Intelligence: Knowledge Representation”); CSI, Chapter 5 (“Artificial Intelligence: Search, Control, and Learning”)

Guest Lectures by: Judy Goldsmith

#### **Module 4: LINGUISTICS AND LANGUAGE COGNITION**

##### *Introduction*

**Readings:** CSI, Chapter 6 (“Linguistics: The Representation of Language”);

**Guest Lectures by:** Anna Bosch

##### *The Evolution of Language Cognition*

**Readings:** ICS-L, Chapter 1 (Gleitman and Newport, “The Invention of Language by Children: Environmental and Biological Influences on the Acquisition of Language”); ICS-L, Chapter 5 (Pinker, “Why the Child Holds the Baby Rabbits: A Case Study in Language Acquisition”);

ICS-L, Chapter 6 (Pinker, “Language Acquisition”);

**Guest Lectures by:** Betty Lorch (not yet confirmed)

##### *Syntax and Morphology*

**Readings:** ICS-L, Chapter 3 (Lieberman, “The Sound Structure of Mawu Words: A Case Study in the Cognitive Science of Speech”); ICS-L, Chapter 8 (Fodor, “Comprehending Sentence Structure”); ICS-L, Chapter 9 (Steedman, “Computational Aspects of the Theory of Grammar”)

**Guest Lectures by:** Raphael Finkel; Gregory Stump

##### *Semantics*

**Readings:** CSI, Chapter 10 (“Semantics”); ICS-L, Chapter 11 (Partee, “Lexical Semantics and Compositionality”); ICS-L, Chapter 12 (Larson, “Semantics”); Chapter 14 (Higginbotham, “Some Philosophy of Language”)

**Guest Lectures by:** Jeanmarie Roughie-Willoughbie

#### **MODULE 5: THE BIOLOGY OF COGNITION**

**Readings:** ICS-VC, Introduction (Kosslyn, “Visual Cognition: Introduction”); ICS-VC, Chapter 1 (Nakayama, He, and Shimojo, “Visual Surface Representation: A Critical Link between Lower-Level and Higher-Level Vision”); ICS-VC, Chapter 2 (Pashler, “Attention and Visual Perception: Analyzing Divided Attention”); ICS-VC, Chapter 3 (Farah, Dissociative Systems for Recognition: A Cognitive Neuropsychology Approach”); ICS-VC, Chapter 4 (Biederman, “Visual Object Recognition”); ICS-VC, Chapter 5 (Goodale, “The Cortical Organization of Visual Perception and Visuomotor Control”); ICS-VC, Chapter 6 (Kowler, “Eye Movements”); ICS-VC, Chapter 7 (Kosslyn, “Mental Imagery”); ICS-VC, Chapter 8 (Spelke, Giteil, and Van der Walle, “The Development of Object Perception”).

**Guest Lectures by:** Hong Yan; David Westneat; Phil Crowley; Thomas Zentall; Larry Gottlob

#### **MODULE 6: THE NEUROSCIENCE OF COGNITION**

**Readings:** CSI, Chapter 7 (“Neuroscience: Brain and Cognition”); photocopied selections from Churchland and Sejnowski, The Computational Brain (Cambridge, Mass: MIT Press, 1995); ICS-L, Chapter 13 (Zurif, “Brain Regions of Relevance to Syntactic Processing”)

**Guest Lectures by:** Jane Joseph; Yang Jiang

#### **MODULE 7: PHILOSOPHICAL ISSUES IN THE STUDY OF COGNITION**

**Readings:** CSI, Chapter 8 (“Philosophy: Foundations of Cognitive Science”); ICS-T, Chapter (Block, “The Mind as the Software of the Brain”); ICS-T, Chapter 6 (Harman, “Rationality”); ICS-VC, Chapter 10 (Dretske, “Meaningful Perception”).

**Guest Lectures by:** Sandy Goldberg; Brad Monton; Harmon Holcomb; Ron Bruzina