

General Education Course Proposal

Proposed Course: PHIL 151 Cognitive Science: Mind Units 3
Prefix No. Title

Department: Philosophy School: Arts and Humanities

GE Category (Indicate one category only):

Foundation: A1 A2 A3 B4
 Breadth: B1 B2 C1 C2 D E
 Integration: B C X D International/Multicultural

Existing Course ; Revised Course ; New Course

Course Included in Current GE Program

New courses require the Undergraduate Course Proposal form in addition to this form.

Revised courses require the Undergraduate Course Change Request in addition to this form.

Proposed catalog description: Limit course description to 40 words using succinct phrases. Include prerequisites, limitations, lecture/lab hours. Indicate former course number, e.g., (Former Biol 105)

The interdisciplinary study of cognition and mind: cognition includes mental states and processes such as thinking, reasoning, remembering, language understanding and generation, visual perception, learning, consciousness, emotions, the self, and our place in the world.

Enrollment limit per section: 50

Expected number of sections per semester - Year 1 1; Year 3 2

Attachments:

1. A statement presenting the ways in which this course meets the Specifications provided for the appropriate section of the General Education Policy as well as in the Policies Inclusion and Evaluation of General Education Courses.
2. A statement of elements common to all sections of this course, identifying content, objectives, required student activities, grading policy, representative texts, and an approximate schedule for the course. Required student activities include such things as papers, research projects, homework, laboratory and/or studio performance, recitations, participation, attendance, and exams.
3. A typical syllabus for a particular offering of the course.
4. Any special cost factors associated with this course.

Approval for Inclusion in General Education

<p><u>Karen Bell</u> <u>4/21/98</u> Department Chair Date</p>	<p><u>[Signature]</u> <u>5/4/99</u> School Curriculum Committee Date</p>
<p><u>[Signature]</u> <u>5/5/99</u> School Dean Date</p>	<p><u>[Signature]</u> <u>8/20/99</u> General Education Subcommittee Date</p>
<p><u>[Signature]</u> <u>8/20/99</u> Associate Provost Date</p>	

ATTACHMENT 2

Statement of common elements, activities, grading, texts, schedule

Course Topics

- A. Every section of Philosophy 151 must require one of the following as a **prerequisite or corequisite**: *Cognitive Science: Computation and Models*, or *Cognitive Neuroscience* in Area B, *Introduction to Psychobiology* in Area B, or *Developmental PsychoBiology* in Area D. The completion of the GE math requirement or equivalent is recommended.
- B. Every section must cover the basic issues – **Foundations** – in Cognitive Science concerning the history of the contemporary concept (20th and 21st century) of the faculties of mind, the nature of automatic formal systems, the nature of semantics, philosophical issues in computer architecture, persons as real machines, real people (moral facts, moral knowledge, and decisions making).
- C. Every section of Phil 151 must include a substantial discussion of the **Foundations**, cover at least four (4) of the **Tools** or related Broad Issues listed in bold below and the **Applications** section (seven). Under the title Tools section, at least two (2) specific issues (in italics) will be covered.
- D. Every section will cover the selected 'Tools' and 'Foundations' issues for the required time.

FOUNDATIONS (must include)

Basic Issues (i.e., common elements that must be included)

One. Approaches to Cognitive Science: the Philosophical foundations of the modern mind

Development of the concept of mind, theories of mind.

The required study of great works traces these origins back to the study of Mind in Descartes'

Meditations, followed by Kant's anthropology and theory of knowledge in the "Critique of Pure Reason"

(Satisfies Specification A by placing locating modern theory in its historical context in the humanities.

Satisfies Specification E by considering issues in aesthetics, language, philosophy and literature from contrasting historical and modern perspectives.)

Development of the modern concept of mind in Cognitive Neurobiology, neuroscience and philosophy

Common sense views on souls, minds, illusion and self.

The required examination of the subjective response begins with the aesthetic (Arts) analysis given in Descartes' On Music, Passions of the Soul and Rules for the Direction of the Mind followed by Kant's treatment of sensibility in the Critique's Transcendental Aesthetic. The study shows how contemporary theory arises out of the traditional humanistic disciplines. Students will not engage in aesthetics but will see how modern theory redefines our concept of aesthetics. (Satisfies Specification B by comparing the traditional humanistic concept of "subjective response" with several perspectives from contemporary cognitive science.) Satisfies Specification E by considering issues in aesthetics, language, philosophy and literature from contrasting historical and modern perspectives.

The classical humanistic explanations of Human behavior

Although the topic argues against all classical humanistic interpretations of aesthetics (art), the humanities and self, the required result is a better understanding between the arts, the humanities and the self is met by linking great works in the humanities (Descartes, Kant, Hobbes) to contemporary works (by Carnap, Wilfrid Sellars, Quine, Dennett, Churchland) to concepts of the "self" in Computer Science, Anthropology, Cognitive Ethology, Psychobiology and Moral Philosophy. (Satisfies Specification C by comparing humanistic dogma to concepts of a person in cognitive science.)

TOOLS (Pick 3)

Broad Issues (i.e., tools used, past and present)

One Purposefully left blank.

Two Automatic Formal Systems

Representation and computation, Logic, Rules, concepts, Images, connections, dynamic systems and mathematical knowledge, philosophy of computational systems,

Linguistics

The issue demonstrates that humanities merge with disciplines that are traditionally regarded as empirical science. Old theories about the nature of language and our culture (e.g., gender stereotyping, language acquisition and understanding) are shown to be developing into and deriving their meaning for our civilization from processes that are increasingly subject to scientific analysis. (Satisfies Specification D by studying contemporary views on the nature of language, narratives, and understanding.)

Three. Semantics

Uninterpreted formal systems, interpreted formal systems, interpreted automatic formal systems
(Satisfies Specification D by developing theories of language processing, narrative processing, and the philosophy of language and understanding narratives.)

Four. Computer Architecture

Turing computability, von Neumann machines, LISP machines, Production Systems, PDP approach, Theory of Dynamic Systems

(Satisfies Specification Integrative by relating the humanistic approaches to their scientific counterparts.)

Five. Real Machines

Challenges to cognitive science, survey of real machines (SHRDLU, Heuristic Search, GPS)

(Satisfies Specification G by showing scientific challenges to the classical conception of belief and value, existence in the humanistic disciplines.)

Six. Real People

Emotions and consciousness, physical and social environments, the future of cognitive science, Perceptual plasticity, Conceptual Change, Moral Facts and moral knowledge

(Satisfies Specification F-G, and Integrative by illustrating the conflicting perspectives on the natures of the self, existence, and the historically grounded humanistic understanding of literature, philosophy and language.)

Applications: How Tools are used Today (must include)

Seven. Models

New ways of looking at human creative activity. Among the highest expressions of human creative activity, the arts have always been a difficult realm to capture, model and study. Resistant to traditional approaches of study from psychology, mathematics and artificial intelligence, the new paradigms provide insights into a new viewpoint that can investigate the subtleties of the human creative experience. New models of the creative experience in the arts address challenges and opportunities in the arts. The applications will include advances both our understanding of artistic phenomena, encompassing perception, cognition, composition, performance and system design and analysis. The musical domains will range from the perception of pitch to the categorization of chords and tones, from the mechanics of playing an instrument to the creation of compositions and the aesthetic implications of such advancements. The range of modeling techniques will be suitably broad. As time permits and resources permit, the study will include imagination engines, Image generators: exploring alternatives to hierarchical structures in art and music and in theories for their analysis, in models for their perception such as mathematical modeling, grammars. Lewin's transformational networks, neural nets, and other formal structures, non-hierarchical evaluations of Schenkerian and other tonal theories: Gjerdingen nets for musical cognition; using connectionist and mathematical models in new art media, personal art generators; nontonal music and its theories, alternative concepts of artistic and musical communities

(Satisfies Specification F-G, and integrative by illustrating the conflicting perspectives between emerging views on the natures of the self, existence, and the historically grounded humanistic understanding of art, literature, philosophy and language.)

Common concepts and coverage devoted to common basic or broad issues (concepts) in Course calendar:

Time Required

Common Basic or Broad Issues (Concepts)

2-4 Weeks

Foundations: Basic Issue One: Foundations of Cognitive Science
Approaches to Cognitive Science: the Philosophical foundations of the modern mind. Philosophical foundations for contemporary theory of mind (Philosophers Carnap, Hempel, Sellars, Quine, Dennett, Churchland) and persons in Modern Philosophy (Descartes, Kant, Hobbes).
(Specification A, B, C, E)

0-3 Weeks

Tools: Broad Issue Two: Automatic Formal Systems
Machines that think, the nature of computability and formal representation from the perspective of philosophy of mind and philosophy of language and philosophy of science
(Specification D)

0-2 Weeks

Tools: Broad Issue Three: Semantics

The study of semantics in Logical theory, Linguistics and natural language processing, problems in meaning and reference in the computational approach. Language acquisition and concept formation.
(Specification D)

0-3 Weeks

Tools: Broad Issue Four: Computer Architecture

Computer systems for understanding narrative, language, art, taste, touch, smell and reasoning. Language, sensation and neuroscience.
(Specification Integration)

0-3 Weeks

Tools: Broad Issue Five: Real Machines

Cognitive psychology and problems in computational problems in translation, micro-worlds, meaning, relevance, problem solving, commonsense stereotypes and simple tasks such as identifying color and shape (Shepard, Metzler, Winograd). Artificial intelligence. Vision.
(Specification Integration, G)

0-3 Weeks

Tools: Broad Issue Six: Real People

How people and machines make sense, use mental images, imagine, perceive, feel, have moods, protect their ego.
(Specification Integration, F, G)

2-3 Weeks

Applications: Broad Issue Seven: Current applications

How theories for analysis of music and art, models for their perception and psychology of cognition and the social setting for their creation alters and dominates the community of music theorists and artists and the humanistic view of what they do and how they do it.
(Specification Integration, F, G)

Main textbooks for Foundations (These will vary but something similar is required)

Representative Texts:

Historical

1) Amaral, P. ed., "Historical Introduction To Cognitive Science," selected readings in philosophy of mind and aesthetics.

Contemporary

1) Stillings, Neil A.; Feinstein, Mark H.; Garfield, Jay L.; Rissland, Edwina L.; Rosenbaum, David A.; Weisler, Steven E.; & Baker-Ward, Lynne (1987). "Cognitive Science: An Introduction" (Cambridge, MA: MIT Press). [Available from bookstore.]

(2) Collins, Allan, & Smith, Edward E. (eds.) (1988). "Readings in Cognitive Science: A Perspective from Psychology and Artificial Intelligence" (San Mateo, CA: Morgan Kaufmann Publishers). [Available from bookstore.]

(3) Haugeland, John.: "Artificial Intelligence: The Very Idea," (1987). (Cambridge, MA: MIT Press). [Available from bookstore.]

(4) Thagard, Paul.: "Mind: Introduction to Cognitive Science." (1997), (Cambridge, MA: MIT Press). [Available from bookstore.]

(5) Churchland, Paul: "A Neurocomputational Perspective." (1993), (Cambridge, MA: MIT Press. [Available from bookstore.]

Selected Papers for Tools and Applications (these will vary but something similar is required)

(6) Dennett, Daniel: "Consciousness Explained." (1991), (Boston, MA: Little, Brown and Co.). [Available from the bookstore]

(7) Green, D. et al: "Cognitive Science: an Introduction." (1997), (Oxford: Blackwell). [Available at the bookstore.]

(8) Brown, Paul: "Digital Illusion." (1998), (Addison-Wesley)

(9) Zdenek and Katetov. "Topological Spaces." (1966) (NY: Wiley)

(10) Chomsky, Noam. "Syntactic Structures." (1971) (Hauge: Mouton)

(11) Gjerdingen, Robert "Using Connectionist Models to Explore Complex Musical Patters." in Todd et al.

(12) Todd, Paul and Loy, Gareth, "Music and Connectionism" (1994) (Cambridge: MIT)

(13) Lewin, David "Twelve-Tone Techniques in Atonal and Other Music Theories" in Perspectives of New Music 21: 312-71 (1987)

(14) Rahn, John. "Some Remarks on Network Models of Music" Xerox (1996)

(15) Lewin, David. "Musical Form and Transformations: 4 Analytic Essays (1993) (Hew Haven: Yale Univ. Press)

(16) Rumelhard, David and McClelland, J. "PDP" (1988) (Cambridge: MIT)

(16) Historical Texts: As indicated in Attachment #1: To include Kant, Descartes, Hobbes, Hume and 20th century writers such as Sellars, Carnap, Quine, Dennett, Churchland. Course packets will contain excerpts from the relevant papers or works.

Required Student Activities (Assignments):

a. Writing Assignments: Multiple writing assignments covering some of the Foundations, Tools and Applications are required. A total of no less than 4000 words (12 single spaced pages in 10pt microspaced type) with one sustained writing assignment using APA format. Comments and feedback on mechanics for each assignment. Writing Grading Criteria appear on an attached sheet. The writing assignments should comprise a significant component of the grading. The writing evaluation criteria appear as an attachment labeled "Writing Evaluation Criteria."

b. Quizzes and exams covering broad issues and/or a midterm are required in addition to the writing assignments if the writing assignments are not used as graded discussion assignments (essay exams).

c. A Final exam is required of all sections and it must be given at the assigned time.

d. As resources are available, a lab and related software will be used.

Evaluation: Each syllabus will contain a grading policy in compliance with the university standards. Please see "Explanation of Grades" under "academic regulations" in your catalog.

Criteria for grading: Each syllabus will state the requirements which will be used in Grading. These will be in accordance with "Grading policies and Practices" under "academic regulations" in the catalog.

Grades: Each syllabus will include a grading scale and an explanation of how grades will be assigned.

General Information included in each syllabus

1. Policy on attendance. Students are responsible for keeping up to date with changes in schedule and will not be excused because they were unable to do so even as a result of a situation beyond their control.
2. Policy on missed quizzes, make-up work, late papers. Students are responsible for doing all work when due. Special arrangements may be considered by the instructor. However, the instructor is under no obligation to provide special scheduling of work even when the missed work is a result of circumstances beyond the students control.
3. Cheating and plagiarism, please see "Cheating and plagiarism" under the "policies and regulations" section of your catalog.
4. ADA: Students with disabilities policy Please see "Disabled" in the "Policies and Regulations" section of your catalog.

Attachment 3

A Typical Syllabus

TOPICS:

Cognitive science is the interdisciplinary study of cognition. Cognition includes mental states and processes such as thinking, reasoning, remembering, language understanding and generation, visual perception, music perception, learning, consciousness, emotions, etc. Some cognitive scientists limit their study to human cognition, though most consider cognition independently of its implementation in humans or computers. Some cognitive scientists study cognition independently of the cognitive agent's environment; others study it within the context of the person, the society, the culture, music and art. Cognitive science can also be defined as, roughly, the (hopefully non-empty) intersection of the disciplines of computer science (especially artificial intelligence), linguistics, philosophy (especially philosophy of mind and philosophy of language), and psychology (especially cognitive psychology). Some writers on cognitive science add cognitive anthropology to this list, and most would add the cognitive neurosciences, perception and psychology of artistic cognition. The former deals in part with the societal and cultural context mentioned above. The latter is concerned with the "implementation" of mind and the perception of music and art in human physiology.

We will review the history, nature, major findings, and philosophical implications of cognitive science, as covered in the Stillings et al. text supplemented by readings from the Collins & Smith anthology and other sources.

TEXTS:

Selected from Main Textbooks for Foundations:

- (1) Amaral, P. ed., "Historical Introduction To Cognitive Science," selected readings in philosophy of mind and aesthetics.
- (2) Stillings, Neil A.; Feinstein, Mark H.; Garfield, Jay L.; Rissland, Edwina L.; Rosenbaum, David A.; Weisler, Steven E.; & Baker-Ward, Lynne (1987). *Cognitive Science: An Introduction* (Cambridge, MA: MIT Press). [Available from bookstore.]
- (3) Collins, Allan, & Smith, Edward E. (eds.) (1988). *Readings in Cognitive Science: A Perspective from Psychology and Artificial Intelligence* (San Mateo, CA: Morgan Kaufmann Publishers). [Available from bookstore.]

Selected Papers [Excerpts Photocopied] for Tools:

- (3) Rapaport, William J. (1990). "Cognitive Science." Technical Report 90-12 (Buffalo: SUNY Buffalo Dept. of Computer Science, May 1990). [Available from the Philosophy dept.]
- (4) Rapaport, William J.; Segal, Erwin M.; Shapiro, Stuart C.; Zubin, David A.; Bruder, Gail A.; Duchan, Judith F.; Almeida, Michael J.; Daniels, Joyce H.; Galbraith, Mary M.; Wiebe, Janyce M.; & Yuhon, Albert Hanyong (1989). "Deictic Centers and the Cognitive Structure of Narrative Comprehension." Technical Report 89-01 (Buffalo: SUNY Buffalo Dept. of Computer Science, March 1989). [Available from the Philosophy Dept.]
- (5) Rapaport, William J.; Segal, Erwin M.; Shapiro, Stuart C.; Zubin, David A.; Bruder, Gail A.; Duchan, Judith F.; & Mark, David M. (1989). "Cognitive and Computer Systems for Understanding Narrative Text." Technical Report 89-07 (Buffalo: SUNY Buffalo Dept. of Computer Science, August 1989). [Available from the Philosophy Dept..]
- (6) Haugeland, John.: "Artificial Intelligence: The Very Idea." (1987). (Cambridge, MA: MIT Press). [Available from bookstore.]
- (7) Thagard, Paul.: "Mind: Introduction to Cognitive Science." (1997). (Cambridge, MA: MIT Press). [Available from bookstore.]
- (8) Churchland, Paul.: "A Neurocomputational Perspective." (1993). (Cambridge, MA: MIT Press). [Available from bookstore.]
- (9) Dennett, Daniel: "Consciousness Explained." (1991). (Boston, MA: Little, Brown and Co.). [Available from the bookstore.]
- (10) Green, D. et al.: "Cognitive Science: an Introduction." (1997). (Oxford: Blackwell). [Available at the bookstore.]

Selected Papers [Excerpts Photocopied] for Applications:

- (11) Gjerdingen, Robert "Using Connectionist Models to Explore Complex Musical Patters." in Todd et al. Handouts
- (12) Todd, Paul and Loy, Gareth. "Music and Connectionism" (1994) (Cambridge: MIT, 1991) Handouts
- (13) Lewin, David "Twelve-Tone Techniques in Atonal and Other Music Theories" in *Perspectives of New Music* 21: 312-71 (1987) Handouts
- (14) Rahn, John. "Some Remarks on Network Models of Music" Xerox (1996) Handouts
- (15) Lewin, David. "Musical Form and Transformations: 4 Analytic Essays (1993) (Hew Haven: Yale Univ. Press) Handouts
- (16) Rumelhard, David and McClelland, J. "PDP" (1988) (Cambridge: MIT) Handouts

- (17) Historical Readings: Including Kant's Critique, Descartes' On Music, Selections from Hobbes, Sellars, Quine (others are included in Haugeland above. [Handouts])
- (18) Loy, G "Connectionism and Musiconomy," in Todd and Loy.
- (19) Laden, B. and Keefe, D. "The Representation of Pitch in a Neural Net Model of Chord Classification," in Todd and Loy.
- (20) Barucha, J. and Todd, P. "Modeling the Perception of Tonal Structure with Neural Nets," in Todd and Loy.
- (21) Todd, P. "A Connectionist Approach to Algorithmic Composition," in Todd and Loy.

TENTATIVE SCHEDULE OF TOPICS AND READINGS

Note: If you follow this schedule for reading and do so in depth, you will be reading for the rest of your life. The topics covered in lectures will draw upon the material. You will be expected to familiarize yourself with the passages by reading them once. The instructor will do the rest.

Foundations

Week 1

[Basic Issue One]

- T What is cognitive science?
- Th What is cognitive science? (continued)
 Stillings et al., "What is Cognitive Science?" Ch. 1;
 Gardner, H., Ch 1. "The Cognitive Revolution." Philosophical foundations.

Week 2 [Basic Issue One]

- T Cognitive psychology
 Begin reading Stillings "Cognitive Psychology: The Architecture of the Mind" Ch. 2: Language, thought and belief
 Supplementary readings for Ch. 2:
 Collins & Smith (hereafter, C&S) or Green, The Architecture of the Mind.
- Th Cognitive psychology (cont.)
 Finish Stillings Ch. 2:
 Begin Stillings "Topics in Cognitive Psychology,;" Ch. 3, Conceptualization, memory, reasoning, problem solving:
 Supplementary readings for Ch. 3: Green, Explanation and Simulation in Cognitive Science.

Tools

Week 3 [Broad Issue Four]

- T Automatic Formal Systems
 Haugeland Ch. 2 47-57. Automatic Formal Systems
- Th Automatic Formal Systems
 Haugeland Ch. 2 57-87

Week 4 [Broad Issue Five]

- T Computer Architecture
 Haugeland Ch. 4 125-167. Computer Architecture
- Th Huageland Cont.

Week 5 [Broad Issue Five]

- T Artificial intelligence (cont.):
 Continue Stillings "Artificial Intelligence: Knowledge Representation," Ch. 4: The nature of artificial intelligence, Knowing
 Begin Stillings "Artificial Intelligence: Search, Control, and Learning," TREES, LIST Ch. 5
 Supplementary reading for Ch. 5:
 Winston, Patrick H. (1975), "Learning Structural Descriptions from Examples," in P. H. Winston (ed.), Psychology of Computer Vision (New York: McGraw-Hill). 157-209; reprinted in R. Brachman & H. Levesque (eds.), Readings in Knowledge Representation (Los Altos, CA: Morgan Kaufmann): 141-168.

- Th Artificial intelligence (concl.)
 Finish Stillings Ch. 5

Week 6 [Broad Issue Three]

- T Linguistics
 Begin Stillings "Linguistics: The Representation of Language," Ch. 6 Syntax.
 Supplementary readings for Ch. 6:

Chomsky, Noam (1971), "Basic Principles," in J. P. B. Allen & P. Van Buren (eds.), *Chomsky: Selected Readings* (London: Oxford University Press): 1-21.

Th Cont.

Week 7 [Broad Issue Three]

T Linguistics (concl.); Neuroscience

Finish Stillings Ch. 6; Begin Stillings "Neuroscience: The Brain and Cognition," Ch. 7

Neurobiology. Psychobiology Supplementary readings for Ch. 7: C&S #1.4, #1.5, #2.7, #4.4

Th Neuroscience (cont.)

Continue Stillings Ch. 7

Week 8 [Broad Issue Six]

T Neuroscience (concl.); Philosophy

Finish Stillings Ch. 7;

Begin Stillings "Philosophy: Foundations of Cognitive Science," Ch. 8

Philosophy in Cognitive Science. ontological issues, epistemological issues, aesthetic issues.

Supplementary readings for Ch. 8:

Green: *The Mind as a Representational System, The Methodology of Cognitive Science*

Fodor, Jerry A. (1981), "The Mind-Body Problem," *Scientific American*

(January): 114-123;

Dennett, Daniel C. (1971), "Intentional Systems," *Journal of Philosophy* 68:

87-106; reprinted in D. C. Dennett, *Brainstorms* (Montgomery, VT: Bradford Books 1978): 3-22,

325-326;

Fodor, Jerry A. (1980), "Methodological Solipsism Considered as a Research

Strategy in Cognitive Psychology," *Behavioral and Brain Sciences* 3: 63-109; reprinted (without

commentaries or reply) in J. A. Fodor, *RePresentations* (Cambridge, MA: MIT Press, 1981): 225-253;

Newell, Allen, & Simon, Herbert A. (1976).

"Computer Science as Empirical Inquiry: Symbols and Search."

Communications of the ACM 3: 113-126; reprinted in J.

Haugeland (ed.), *Mind Design* (Cambridge, MA: MIT Press, 1981): 35-66.

Th Philosophy (cont.)

Continue Stillings Ch. 8. The philosophical foundations of cognitive science

Week 9 [Broad Issue Three]

T Philosophy (concl.); Language acquisition

Finish Stillings Ch. 8;

Begin Stillings "Language Acquisitions." Ch. 9

Th Language acquisition (concl.); Semantics

Finish Stillings Ch. 9;

Begin Stillings "Semantics." Ch. 10. Meaning, reference, sense, computational models of semantic processing.

Supplementary readings for Ch. 10: C&S #2.1, #2.2, #3.3, #5.1:

Frege, Gottlob (1892), "On Sense and Reference." M. Black (trans.), in P.

Geach & M. Black (eds.), *Translations from the Philosophical Writings of Gottlob Frege* (Oxford: Basil Blackwell, 1970): 56-78;

Maida, Anthony S., & Shapiro, Stuart C. (1982), "Intensional Concepts in

Propositional Semantic Networks," *Cognitive Science* 6: 291-330; reprinted in R. Brachman & H.

Levesque (eds.), *Readings in Knowledge Representation* (Los Altos, CA: Morgan Kaufmann): 169-189;

Hirst, Graeme (1989), "Ontological Assumptions in Knowledge Representation," *Proceedings of the First*

International Conference on Principles of Knowledge Representation and Reasoning (Toronto) (San

Mateo, CA: Morgan Kaufmann): 157-169.

Week 10 [Broad Issue Three]

T Semantics (concl.); Natural-language understanding

Finish Stillings Ch. 10;

Begin Stillings "Natural Language Processing." SHRDLU, JERKY, Ch. 11. The Role of Discourse

Grice, H. Paul (1975), "Logic and Conversation." in P. Cole & J. Morgan (eds.), *Syntax and Semantics*, Vol. 3

(New York: Academic Press):

Searle, John R. (1965), "What Is a Act?," in M. Black (ed.), *Philosophy in*

America (London: Allen Unwin): 221-239; reprinted in J. R. Searle (ed.),

The Philosophy of Language (London: Oxford University Press, 1971): 39-53;

Shapiro, Stuart C., & Rapaport, William J (1986), "SNePS Considered as a Fully Intensional

Propositional Semantic Network," Proceedings of the Fifth National Conference on Artificial Intelligence

Th Natural-language understanding (concl.); Vision
Finish Stillings Ch. 11;
Begin Stillings "Vision." Ch. 12, Low-level visual processing (seeing points), intermediate processing (seeing lines), high-level processing (seeing pictures)
Supplementary readings for Ch. 12: C&S #6.1, #6.2, #6.3

Week 11 [Broad Issue Six, Seven]

T Vision (cont.)
Continue Stillings Ch. 12 "Vision". Green "Surfaces, Objects and Faces"

Th Vision, Music (concl.)
Finish Stillings Ch. 12. Rahn: Lewin's networks for music creativity

Week 12 [Broad Issue Five]

T Cognitive and computer systems for understanding narrative text
Rapaport, William J. et al.; (1989), "Deictic Centers and the Cognitive Structure of Narrative Comprehension," Technical Report 89-01 (Buffalo: SUNY Buffalo Dept. of Computer Science, March 1989);

Th Cognitive and computer systems for understanding narrative text (cont.), Green, "How Many Routes in Reading?", "Meaning and Conversation," "The Structure of Sentences."

Week 13 [Broad Issue Five]

T Real People
Haugeland, "Real People," ch.6. Emotions. Consciousness, Bharucha and Todd's Perception of Tone.

Th Physical and Social Environments. Gender, race, and challenges to CRUM (computational representational Understanding of Mind)

Thagard, "Emotions and consciousness," ch 9. "Physical and social environments," ch. 10., Green "Pragmatics and the development of Communicative Ability"

Applications

Week 14 [Broad Issue Two]

T Can computers carry a tune?
Recent developments in the perception and psychology of Music generation and appreciation in Todd and Loy.

Th David Lewin's networks for music appreciation

Week 15 [Broad Issue Seven]

T But is it art? Imagination engines and the obsolete artist

Th Visual Generators and personal reality generators

Week 16

T Further Research and Directions: The end of the Artist and the Beginning of Art
Neural Networks that Learn to Play different Styles

Th What makes a work "Good"?

Evaluation: The grading policy is listed given in the university catalog. Writing is evaluated according to the attached evaluation form

Criteria for grading: See your current catalog for standard grading practices.

Grades: 30% of your grade will be the research paper. 40% will be summaries of selected reading. 25% for a combination of quizzes and the midterm and 5% for the final.

General Information:

5. Policy on attendance. 5% extra credit for 2 or fewer absences. Missing 15% of the classes results in a U.
6. Policy on missed quizzes, make-up work, late papers: anything not done on time counts as a "0"
7. Cheating and plagiarism: see your catalog for existing policy.
8. ADA: Students with disabilities policy: please notify the instructor if you have special access or exam requirements. If you wish, you may have student services contact the instructor. In general, anything you normally would ask for is fine with the instructor.