

# Psych/Ling/Phil/CIS 612

## Introduction to Cognitive Science

Course Syllabus, Autumn 2007

- Course:** Psych/Ling/Phil/CIS 878  
**Call number:** 18415-0  
**Credits:** 3  
**Dates:** Sep 20–Dec 4, 2007  
**Times:** Tuesdays and Thursdays 09:30–11:18 a.m.  
**Room:** Baker Systems Engineering BE, Room 0180  
**Prerequisites:** Graduate standing, permission of instructor, or at least 12 credit hours from at least two of the following four areas: computer science, linguistics, philosophy, and psychology.  
**Websites:** <https://carmen.osu.edu> and <http://alexpetrov.com/teach/cogintro/>  
**Textbook:** Jay Friedenberg & Gordon Silverman (2006). *Cognitive Science: An Introduction to the Study of Mind*. Thousand Oaks, CA: Sage Publications. ISBN 1-4129-2568-1.  
**Instructor:** Dr. Alexander Petrov  
(614) 247-2734 [psych612@cogmod.osu.edu](mailto:psych612@cogmod.osu.edu)  
200B Lazenby Hall Office hours: T, R 11:20–12:00

### Course Overview

What is cognition and how does it emerge from the brain? This course introduces you to the exciting interdisciplinary field of cognitive science. Researchers in philosophy, neuroscience, psychology, artificial intelligence, and linguistics realized that they were asking many of the same questions about the nature of the human mind/brain, that they had developed complementary and synergistic methods of investigation, and that the evidence led them to compatible answers to their questions. This course introduces cognitive science through a representative sample of such questions, methods, and answers. It is not a special-topic course for students who seek detailed knowledge in a specific area of cognitive science. We will try not to lose sight of the forest for the trees but we will take a closer look at a few trees too because science is in the details. The first half of the course introduces the constituent disciplines and their respective contributions to the study of cognition. The second half introduces three select topics in greater depth: cognitive architectures, memory, and visual object recognition. Three unifying themes are emphasized throughout: 1. Information processing: The mind/brain is viewed as a complex system that receives, stores, retrieves, transforms, and transmits information. 2. Neurological grounding: Explicit effort is made to show how mental phenomena emerge from the interactions of networks of neurons in the brain. 3. Cognitive architecture: The emphasis is on functionally complete systems rather than disjoint empirical phenomena.

## Intended Audience. Prerequisites

This course is cross-listed in the Departments of Computer and Information Science, Linguistics, Philosophy, and Psychology. It is intended for graduate and advanced undergraduate students in these departments. Interested students from related areas are welcome too. The formal prerequisites for taking the course are: graduate standing in any of these departments **or** permission of the instructor **or** at least 12 undergraduate-level credit hours from at least two of the four disciplines. The informal prerequisites are: willingness to step outside the confines of one's area of specialization, willingness to read the professional literature (as opposed to textbooks) with help from the instructor and one's peers, willingness to participate in open discussions, and the ability to write clearly and concisely about topics outside one's area of specialization.

## Course Objectives

Upon successful completion of the course, the students will:

- Appreciate the interdisciplinary nature of cognitive science, the diversity of viewpoints, the controversies and the areas of nascent consensus.
- Appreciate the contribution of each of the five constituent disciplines and be familiar with its methods, key concepts, and focus of investigation.
- Be proficient in the *lingua franca* of cognitive science—the language of information processing.
- Have basic familiarity with brain anatomy and physiology.
- Understand the basic cognitive architecture—how perception, memory, language, motor control, and so forth come together to produce adaptive behavior.
- Know a multitude of specific concepts, theories, and experimental results covered in course. The lecture plan below lists some relevant keywords.
- Be able to read and discuss research papers from multiple disciplines.
- Be able to write critical essays on topics outside one's area of specialization.

## Course Materials

The main textbook is *Cognitive Science: An Introduction to the Study of Mind* (Friedenberg & Silverman, 2006). Various study aids (flashcards, quizzes) are available from Sage Publications' web site: <http://www.sagepub.com/CSstudy/> The textbook often sacrifices depth for coverage and so we will rely on additional readings for greater depth. The readings are listed in the bibliography below. All required readings (except the textbook itself) will be distributed in class in Xerox form; PDF versions of many of them are also posted on the Carmen website <https://carmen.osu.edu/>

## Teaching Method

As we will learn in the course, people remember much better when they study on a regular basis rather than cramming for a final exam. Also, people remember better when they actively process the material rather than just sit and listen. The course organization capitalizes on these important properties of memory. In addition to the lectures, it is arranged that you read something every week, discuss something every week, and write something every other week. A typical week might go as follows. You are advised to

read the assigned textbook chapter and/or supplementary materials in preparation for the Tuesday class. This class is a two-hour lecture that introduces a particular discipline or topic. Among other things, the lecture provides background for understanding the target article for the week. These target articles are classic publications in the research literature that have stood the test of time and are recognized to have lasting value and importance in cognitive science. You are required to read each target article carefully and be prepared to discuss it in detail during the second hour of the Thursday class. (The first hour on Thursdays is in lecture format.) For some target articles, you will also be required to write a 500-word summary paper by Friday evening.

## Evaluation

Your grade will depend on four components in the following proportions:

- Summary papers (5 papers worth 8% each) 40%
- Attendance and participation in discussions 9%
- Midterm Exam (Thursday, 10/30/2007) 20%
- Final Exam (Thursday, 12/04/2007) 31%

Grades are based on absolute cutoffs: A=90-100%, B=80-89%, C=70-79%, D=60-69%.

**Summary papers:** There are 9 target articles listed in the calendar below. Forty percent of your final grade will be based on your summary papers of 5 of these 9 articles. You decide which particular target articles to write about, as long as the first three summaries come from the first half of the course (articles 1–5) and the remaining two come from the second half (articles 6–9). Each summary paper contributes up to 8 points toward your final grade. For extra credit, you may write a sixth summary paper, worth up to 5 points and selected from either half of the course. You cannot submit more than six summary papers; if you do, the extra ones will not be graded and cannot bring any points.

Guidelines for writing good summary papers:

- Begin with an introductory paragraph that states the purpose, motivation, or goal of the target article.
- The paper should summarize two major issues or problems that are discussed in the target article. If there are more than two issues, then pick the two that you think are most relevant and important.
- Your summary paper must represent your own synthesis of information.
- The paper should include your own critical reactions to the target article. For example, you may disagree with the author(s) in certain points, or may have alternative viewpoints and/or new suggestions. Those critical reactions must be supported by concisely stated arguments and/or evidence.
- Avoid plagiarism. It is good to bring empirical evidence or arguments in support of your case, but you must cite your sources and thereby give proper credit to the original author(s).
- Each summary paper must be 400–600 words long and must be double-spaced, properly formatted, and proofread. No separate title page is required. On the upper-left corner of the first page, write the title of the target article, your name,

submission date, and the number of words. A Word template is available on Carmen to assist you in the formatting.

- The paper will be graded as a weighted sum of scores on three categories:
  - 50%: Thoroughness and correctness of the summary (25% for each issue).
  - 30%: Ability to critically examine the target article in your own terms.
  - 20%: General understanding of the concepts and issues involved; clarity of presentation (organization, clear writing, paper format).
- Note that PSY 612 is not a writing course and hence extensive editorial or stylistic comments on your summaries are not offered.

Each summary paper must be submitted in electronic form on the Carmen website (<https://carmen.osu.edu/>). There are 9 Dropboxes—one for each target article. Your papers must be uploaded to the corresponding Dropbox in MS Word (.doc), plain text (.txt), PDF, HTML, or RTF format. Assignments in other formats are not acceptable and will not be graded. In particular, *MS Works* files (.wps) are not supported. **The only way to submit your homework is to upload it to its corresponding Dropbox on Carmen.** Files dropped in a wrong Dropbox, submitted by email, slipped under a door, and so on will not be accepted without prior permission. The Course Calendar lists a submission deadline corresponding to each target article. Typically, it is 11:59 pm on the Friday after the article is discussed in class. After a two-day grace period, the corresponding Carmen Dropbox closes. There is no penalty for late submissions as long as the Dropbox is still open. **There is no way to obtain credit for an assignment after the grace period has passed and the corresponding Dropbox has closed.** If you write a sixth paper for extra credit, it must be submitted by the regular deadline for the corresponding target article. Once you have submitted six papers, you cannot submit additional ones to make up for low scores on earlier submissions. There are no exceptions to the rules printed in boldface above.

At the end of the quarter, the credit points for summary papers are determined as follows. If you have submitted 5 papers, the credit is simply the sum of their scores (max=40). If you have submitted 6 papers, the credit is the sum of the top 5 scores plus EC, where EC is either 5 pts or the lowest (sixth) score, whichever is less. Thus, with extra credit you can obtain a maximum of 45 points for summary papers. If you have submitted 7 or more papers, those submitted after the sixth will not be graded and bring no additional points.

**Attendance and participation in discussions:** Participation in the class discussions is an integral element of this course. You are required to read all 9 target articles and to attend and actively contribute to all discussions, including those you have chosen not to write summaries of. You earn 1 point for attendance in each discussion. Attending the lectures is strongly encouraged but not required. Come to class—it makes a difference.

**Exams:** Both the Midterm Exam (10/30) and the Final Exam (12/04) are closed-book and consist of short-answer and essay questions. Sample questions will be given in class. The Final Exam is not cumulative, except that the topics covered in the second half of the course depend on concepts and facts introduced in the first half. No make-up exams will be given, except in the case of documented illness or emergency. All make-up exams will be oral. In the event of a last-minute emergency, you **must** call Dr. Petrov (247-2734) or

the office associate for the cognitive area (Jamie Bergman, 292-1123) **on the same day as the exam**, preferably before the exam begins. Acceptable excuses for missing an exam are a death in your family, personal illness or the illness of your child or spouse, and unforeseen accidents like your car breaking down or getting stuck in an elevator. Please obtain documented proof of these events should they occur. If you are late for an exam, you will be allowed to take it but you will have to submit your answers by the closing time like everybody else.

## **Academic Ethics**

All students enrolled in OSU courses are bound by the Code of Student Conduct ([http://studentaffairs.osu.edu/resource\\_csc.asp](http://studentaffairs.osu.edu/resource_csc.asp)). The instructor and course assistants are committed to maintaining a fair assessment of student performance in this course. Suspected violations of the Code will be dealt with according to the procedures detailed in the Code. Specifically, any alleged cases of misconduct will be referred to the Committee on Academic Misconduct.

There are two major ethical considerations in this course. First, both exams are closed book. No notes may be used during the examinations and you may not confer with your fellow students or look at other examinations for answers during the exam period. Prior to the examinations, you are encouraged to study in small groups. However, once you enter the examination room, you are expected to work alone. Second, you are expected to work alone on your homework assignments. You may not turn in anything that you did not *completely* write. Be careful about plagiarism; attribute quotes and ideas that others have previously published where appropriate. A very comprehensive website that describes most aspects of plagiarism has been produced by Northwestern University (<http://www.northwestern.edu/uacc/plagiar.html>).

## **Accommodations for Students with Special Needs**

The policy of The Ohio State University is to provide every reasonable, appropriate, and necessary accommodation to qualified disabled students. The University's colleges and academic centers evaluate and judge applications on an individual basis and no categories of disabled individuals are automatically barred from admission. The privacy rights of each disabled person are honored to the fullest extent possible. The University's interest in a student's disabilities are only for the purpose of accommodating his/her specific disability, thereby providing an academically qualified disabled student access to programs and activities accorded all other qualified students. Whenever generally accessible facilities do not adequately accommodate a specific disability, the University makes every reasonable accommodation and program or facility adjustment to assure individual access. These policies are fully supported and practiced in this class.

If you have a disability documented with the Office of Disability Services (<http://www.ods.ohio-state.edu>, 150 Pomerene Hall, 614-292-3307), please contact Dr. Petrov privately ([petrov.11@osu.edu](mailto:petrov.11@osu.edu), 200B Lazenby Hall, 614-247-2734) by the end of the second week of classes (9/28/2007) so that any accommodations can be made.

## Course Calendar

1. **R 09/20** – Introduction. Information processing. Interdisciplinary approach. Reading: Textbook Chapter 1 (pp. 1-27).
2. **T 09/25** – Philosophy I: What is philosophy? Epistemology: Descartes, Hume, Kant. Formal logic: Frege, Russell. Computation. Mind-body problem. Reading: Chapter 2 (pp. 29-64).
3. **R 09/27** – Philosophy II. Discussion of Ryle (1949), *Descartes' Myth*. **Short paper #1 due 09/28.**
4. **T 10/02** – Neuroscience I: Neurons, networks, and brains. Principles of cortical function. Readings: Chapter 6 (pp. 163-175), Kolb & Whishaw (2006, pp. 34-55, 62-73). O'Reilly & Munakata (2000, pp. 205-214).
5. **R 10/04** – Neuroscience II. Discussion of Fuster & Alexander (1971), *Neural activity related to short-term memory*. **Short paper #2 due 10/05.**
6. **T 10/09** – Psychology I: A capsule history of psychology. Ebbinghaus. Power law of practice. Behaviorism. Pavlovian and operant conditioning. The multi-store model. Baddeley's working memory model. Multiple memory systems. Required readings: Chapter 4 (pp. 95-100), Ch. 5 (pp. 125-139, 158-162), Ch. 3 (pp. 85-89). Optional reading: Ch. 3 (pp. 65-84, 90-93), Ch. 7 (pp. 224-233).
7. **R 10/11** – Psychology II. Discussion of Rundus & Atkinson (1970), *Rehearsal processes in free recall: A procedure for direct observation*. **Short paper #3 due 10/12.**
8. **T 10/16** – Artificial Intelligence I: Strong and weak AI. Formal systems, Universal Turing Machines. What is representation? Turing test. Physical Symbol System Hypothesis. Required readings: Ch. 10 (pp. 320-351), Newell (1990, pp. 111-117), Newell et al. (1989, pp. 93-95, 103-108). Optional readings: Ch. 5 (pp. 149-158), Ch. 11 (pp. 353-380, 393-397), Ch. 12 (pp. 399-411), Ch. 10 (311-319).
9. **R 10/18** – Artificial Intelligence II. Discussion of Turing (1950), *Computing machinery and intelligence*. **Short paper #4 due 10/19.**
10. **T 10/23** – Linguistics I: What is language? Components of a grammar. Syntax and productivity. Readings: Whitney (1998), *What language users must know*. Textbook Chapter 12 (pp. 275-297).
11. **R 10/25** – Linguistics II. Language acquisition. The nature-nurture debate. Discussion of Chomsky (1986), *Knowledge of language as a focus of inquiry*. Reading: Feldman (2006, pp. 271-282). **Short paper #5 due 10/26.**
12. **T 10/30** – **Midterm Exam** – Same time, same place (9:30-11:18, BE 180)
13. **R 11/01** – Cognitive architectures I. Definitions. Horizontal & vertical integration. Discussion of Anderson & Lebiere (2003), *The Newell Test for a theory of cognition*. **Short paper #6 due 11/02.** Reading: Anderson (2007, pp. 3-18), Newell et al. (1989, pp. 93-103).

14. **T 11/06** – Cognitive architectures II: System levels. Subsumption architecture. Readings: Newell (1990, pp. 117-131), Textbook Chapter 12 (pp. 412-419).
15. **R 11/08** – Cognitive architectures III. Neural-network models. Distributed representations. Discussion of O'Reilly (1998), *Six principles for biologically based computational models of cortical cognition*. **Short paper #7 due 11/13**. Readings: Ch. 7 (pp. 207-224, 233-235). O'Reilly & Munakata (2000: 205-211).
16. **T 11/13** – Learning and memory I: Synaptic plasticity. Hebbian learning. Reading: O'Reilly & Munakata (2000, Chapter 4, pp. 115-120), O'Reilly (1998).
17. **R 11/15** – Learning and memory II. Pattern associator. Multi-layer networks. Amnesia. Reading: McClelland (2000, pp. 583-587), Chapter 6 (pp. 187-197). Discussion of Eichenbaum (2002), *Amnesia: Learning about memory from memory loss*. **Short paper #8 due 11/16**.
18. **T 11/20** – Learning and memory III. Error-driven (task) learning. Bidirectional networks. Constraint satisfaction. Reading: McClelland (2000, pp. 589-594).  
R 11/22 – Thanksgiving Holiday. No classes.
19. **T 11/27** – Vision. Dorsal and ventral streams. Object recognition. Discussion of Biederman & Cooper (1991), *Priming contour-deleted images: Evidence for intermediate representations in visual object recogn.* **Short paper #9 due 11/28**. Readings: Textbook Chapters 4 and 6 (pp. 100-107, 120-122, 176-181, 202-203).
20. **R 11/29** – Cognitive architectures IV. Complementary memory systems. Tripartite architecture. ACT-R architecture. Synthesis of ACT-R and Leabra. Readings: O'Reilly & Munakata (2000, pp. 211-225), Anderson (2007: 18-38), Textbook Chapter 13 (pp. 449-454).
21. **T 12/04** – **Final Exam** – Same time, same place (9:30-11:18, BE 180)

The above calendar is subject to change at the discretion of the instructor, depending on the rate of progress through the material, student interest in alternative topics, and/or scheduling constraints.

### Additional Readings

In addition to Friedenberg & Silverman's textbook, which is the main text for this course, the following required readings supplement and amplify some topics of particular importance. The list of readings is subject to change at the discretion of the instructor.

1. Anderson, John R. (2007). Cognitive architecture. Chapter 1 in *How can the human mind occur in the physical universe?* (pp. 3-39). New York: Oxford University Press. [Available on Carmen] Text for Lectures 13, 14, and 20.
2. Anderson, John R. & Lebiere, Christian (2003). The Newell Test for a theory of cognition. *Behavioral and Brain Sciences*, 26, 587-640. [Available on Carmen] **Discussion paper #6, due 11/02**.

3. Biederman, Irving & Cooper, Eric E. (1991). Priming contour-deleted images: Evidence for intermediate representations in visual object recognition. *Cognitive Psychology*, 23, 393-419. [Available on Carmen] **Discussion paper #9, due 11/28.**
4. Chomsky, Noam (1986). Knowledge of language as a focus of inquiry. Chapter 1 in *Knowledge of language: Its nature, origin, and use* (pp. 1-14). New York: Praeger. Reprinted in B. C. Lust & C. Foley (Eds.) (2004). *First Language Acquisition: The Essential Readings* (pp. 15-24). Malden, MA: Blackwell Publishing. **Discussion paper #5, due 10/26.**
5. Eichenbaum, Howard (2002). Amnesia: Learning about memory from memory loss. Chapter 1 in *The Cognitive Neuroscience of Memory: An Introduction*. Boston, MA: Oxford University Press. **Discussion paper #8, due 11/16.**
6. Feldman, Jerome (2006). The language wars. Chapter 22 in *From Molecule to Metaphor: A Neural Theory of Language* (pp. 271-282). Cambridge, MA: MIT press. Main text for lecture 11.
7. Fuster, Joaquin M. & Alexander, Garrett E. (1971). Neural activity related to short-term memory. *Science*, 173, 652-654. [Available on Carmen] **Discussion paper #2, due 10/05.**
8. Kolb, Brian & Whishaw, Ian (2006). How does the nervous system function? (pp. 34-73). Chapter 2 in *An Introduction to Brain and Behavior* (2<sup>nd</sup> Ed.). New York: Worth Publishers. Main text for Lecture 4.
9. McClelland, James L. (2000). Connectionist models of memory. In E. Tulving & F. Craik (Eds.), *The Oxford Handbook of Memory* (pp. 583-596). Oxford Univ. Press. Text for lectures 17, 18, and 20.
10. Newell, Allen (1990). Human cognitive architecture (pp. 111-131). Excerpt from Chapter 3 in *Unified Theories of Cognition*. Cambridge, MA: Harvard University Press. Text for Lectures 8 and 14.
11. Newell, A., Rosenbloom, P. S., & Laird, J. E. (1989). Symbolic architectures for cognition. Excerpt from Chapter 3 in M. I. Posner (Ed.) *Foundations of Cognitive Science* (pp. 93-109). Cambridge, MA: MIT Press. [Available on Carmen] Text for Lectures 8 and 13.
12. O'Reilly, Randall C. (1998). Six principles for biologically based computational models of cortical cognition. *Trends in Cognitive Sciences*, 2 (11), 455-462. [Available on Carmen] **Discussion paper #7, due 11/13.**
13. O'Reilly, Randall C. & Munakata, Yuko (2000). Large-scale brain area functional organization (pp. 205-225). Chapter 7 in *Computational Explorations in Cognitive Neuroscience: Understanding the Mind by Simulating the Brain*. Cambridge, MA: MIT Press. [Available on Carmen] Text for Lectures 4, 15, 18, and 20.
14. Rundus, Dewey & Atkinson, Richard C. (1970). Rehearsal processes in free recall: A procedure for direct observation. *Journal of Verbal Learning and Verbal Behavior*, 9, 99-105. Reprinted in Lloyd K. Komatsu (Ed.) (1994). *Experimenting with the Mind: Readings in Cognitive Psychology* (pp. 157-165). Pacific Grove, CA: Brooks/Cole Publishing Co. **Discussion paper #3, due 10/12.**

15. Ryle, Gilbert (1949), *Descartes' Myth*. Chapter 1 in *The Concept of Mind* (pp. 11-24). New University edition, University of Chicago Press. **Discussion paper #1, due 9/28.**
16. Turing, Alan M. (1950). Computing machinery and intelligence. *Mind*, 59, 433-460. [Available on-line <http://loebner.net/Prizef/TuringArticle.html>] **Discussion paper #4, due 10/19.**
17. Whitney, P. (1998). What language users must know (pp. 31-71). Chapter 2 in *The Psychology of Language*. Boston, MA: Houghton Mifflin Co.

## Recommended Books

If you want to learn more, the following books are good, thoughtful starting points:

1. Anderson, John R. (2004). *Cognitive Psychology and Its Implications* (6<sup>th</sup> Ed.). New York: Worth Publishers. ISBN 0716701103.
2. Anderson, John R. (2007). *How can the human mind occur in the physical universe?* New York: Oxford University Press. ISBN 978-0-19-532425-9.
3. Blackmore, Susan (2004). *Consciousness: An Introduction*. New York: Oxford University Press. ISBN 0-19-515343-X.
4. Carroll, David W. (2008). *Psychology of Language* (5<sup>th</sup> Ed.). Belmont, CA: Thompson. ISBN 0-495-09969-4.
5. Chalmers, David J. (2002). *Philosophy of Mind: Classical and Contemporary Readings*. New York: Oxford University Press. ISBN 0-19-514581.
18. Churchland, Patricia S. & Sejnowski, Terrence J. (1994). *The Computational Brain*. MIT Press. ISBN 0-262-53120-8.
6. Eichenbaum, Howard (2002). *The Cognitive Neuroscience of Memory: An Introduction*. Boston, MA: Oxford University Press. ISBN 978-0-19-514175-7.
7. Haugeland, John (1989). *Artificial Intelligence: The Very Idea*. MIT Press. ISBN 0-262-58095-0.
8. Haugeland, John (Ed.) (1997). *Mind Design II: Philosophy, Psychology, Artificial Intelligence* (2<sup>nd</sup> Ed.). Cambridge, MA: MIT Press. ISBN 0-262-58153-1.
9. Hofstadter, Douglas R. (1985). Review of *Alan Turing: The Enigma*. Chapter 12 in *Metamagical Themas: Questing for the Essence of Mind and Pattern* (pp. 483-491). Basic Books.
10. Kolb, Brian & Whishaw, Ian (2003). *Fundamentals of Human Neuropsychology* (5<sup>th</sup> Ed.). New York: Worth Publishers. ISBN 0-7167-5300-6.
11. Kolb, Brian & Whishaw, Ian (2006). *An Introduction to Brain and Behavior* (2<sup>nd</sup> Ed.). New York: Worth Publishers. ISBN 0-7167-1187-7.
12. Lakoff, George & Johnson, Mark (1980). *Metaphors We Live By*. Chicago: The University of Chicago Press. ISBN 0-226-46801-1.
13. Newell, Allen (1990). *Unified Theories of Cognition*. Cambridge, MA: Harvard University Press. ISBN 0-674-92099-6.

14. O'Reilly, Randall C. & Munakata, Yuko (2000). *Computational Explorations in Cognitive Neuroscience: Understanding the Mind by Simulating the Brain*. Cambridge, MA: MIT Press. ISBN 0-262-65054-1.
15. Palmer, Stephen E. (1999). *Vision Science: Photons to Phenomenology*. Cambridge, MA: MIT Press. ISBN 0-262-16183-4.
16. Posner, Michael I. (Ed.) (1989). *Foundations of Cognitive Science*. Cambridge, MA: MIT Press. ISBN 0-262-66086-5.
17. Russell, Stuart & Norvig, Peter (2003). *Artificial Intelligence: A Modern Approach* (2<sup>nd</sup> Ed.). Upper Saddle River, NJ: Prentice Hall. ISBN 0-13-080302.
18. Smolensky, Paul & Legendre, Géraldine (2006). *The harmonic mind: From neural computation to optimality-theoretic grammar*. Cambridge, MA: MIT Press. ISBN 0-262-19526-7. [Warning: Very technical, but some chapters are more accessible.]
19. Stillings, N. A., Weisler, S. E., Chase, C. H., Feinstein, M. H., Garfield, J. L., & Rissland, E. L. (1995). *Cognitive Science: An introduction* (2<sup>nd</sup> Ed.). Cambridge, MA: MIT Press. ISBN 0-262-19353-1.
20. Whitney, Paul (1998). *The Psychology of Language*. Boston, MA: Houghton Mifflin Co. ISBN 0-395-75750-9.

Finally, welcome to the course. I hope that you will enjoy the class and learn valuable information and skills. I look forward to seeing you on September 20.

Alex Petrov

Syllabus612-au07.doc, last updated 28 November 2007