

Psychology 251—Experimental Psychology:
Learning and Retention

Psychology 252—Experimental Psychology:
Perception

Psychology 253—Physiological Psychology

Psychology 254—Experimental Psychology:
Language and Thought

Psychology 255—Cognitive Neuroscience

Psychology 305—Speech and Cognition

Sociology 222—Structural Linguistics

**★COGNITIVE SCIENCE 110 (3)—Introduction to
Cognitive Science**

This course introduces the student to the information processing approach of cognitive science by examining the ability to understand and produce language from the perspectives of computer science, linguistics, neuroscience, philosophy, and psychology. *Staff.*

Spring

**COGNITIVE SCIENCE 395 (3)—Special Topics in
Cognitive Science**

Prerequisites: Cognitive Science 110 and six credits chosen from Computer Science 111, 301, Philosophy 106, 313, Psychology 112, 180. This seminar provides the advanced student with a more thorough knowledge of the methods of cognitive science. The course focuses on a specific cognitive capacity—spatial memory, word recognition, sentence processing, or visual pattern recognition, for instance—and compares competing information processing models, examining how they can be tested in the laboratory and by computer simulation. Topics will vary and may be determined, in part, by student interest. May be repeated for degree credit with permission and if the topics are different. *Staff.*

**COGNITIVE SCIENCE 403 (3)—Directed
Individual Study**

Prerequisites: Cognitive Science 395 or permission of the Cognitive Science program adviser. Conferences, independent reading, and research leading to a topic for the senior thesis. This course is taken by all Cognitive Science majors in preparation for the senior thesis. *Cognitive Science faculty.*

COGNITIVE SCIENCE 473 (3)—Senior Thesis

Prerequisite: Cognitive Science 403. Cognitive Science faculty.

Winter

COMPUTER SCIENCE

PROFESSORS WHALEY, LAMBERT
ASSISTANT PROFESSOR VERMEER

MAJOR

A major in **computer science** leading to a Bachelor of Arts degree requires completion of at least 41 credits, including the following:

1. Computer Science 111, 112, 201, 210, 211, 312, 313; Mathematics 121
2. either Computer Science 423 or 493 (3-3)
3. either Mathematics 102 or 122
4. one course chosen from Computer Science 315, 317, 320, 330, 332, 340, 397
5. completion of one of the following two groups:
 - a. six additional credits in computer science
 - b. three additional credits in computer science and, with approval of a student's computer science adviser, nine credits from a cognate area such as accounting, economics, engineering, management, mathematics or physics. Examples of appropriate cognate work are available from the department head

Students should consult with an adviser in the department when choosing courses to fulfill requirement 5b. above.

A major in **computer science** leading to a Bachelor of Science degree requires completion of at least 50 credits, including the following:

1. Computer Science 111, 112, 201, 210, 211, 312, 313; Mathematics 121, 222
2. either Computer Science 423 or 493 (3-3)
3. one course chosen from Computer Science 315, 317, 320, 330, 332, 340
4. six additional credits in computer science
5. six additional credits in mathematics at the 200-level or above

Additional courses required as prerequisites for completion of the above include Mathematics 101 and 102.

In order that the discrete mathematics requirement for Computer Science 211, 312, and 313 be completed in a timely fashion, freshmen expecting to major in computer science are encouraged to take Mathematics 121 in their freshman year.

HONORS: An Honors Program in computer science is offered for qualified students; see the department head for details.

★**COMPUTER SCIENCE 111 (4)—Fundamentals of Computer Science I**

An examination of some of the major areas of computer science such as computer organization, algorithms and data structures, programming, and the theory of computation. Weekly meetings will include lectures and a laboratory session. *Staff.*

Fall, Winter

★**COMPUTER SCIENCE 112 (4)—Fundamentals of Computer Science II**

Prerequisite: Computer Science 111. This course includes a disciplined approach to programming in a high level, object-oriented programming language building on the introduction in Computer Science 111. Emphasis is on problem solving methods and algorithm development. Additional topics will be chosen from linear data structures, machine organization, computer graphics, numerical methods and applications of computer science *Staff.*

Winter

COMPUTER SCIENCE 120 (4)—Procedural Programming

Prerequisite: Permission of instructor. This course includes the fundamentals of traditional procedural programming with a popular language such as C++. Topics include the common control structures, arrays, and classes. *Staff.*

Fall

COMPUTER SCIENCE 201 (3)—Fundamentals of Computer Science III

Prerequisite: Computer Science 112. This course is a continuation of Computer Science 112. Emphasis is on the use and implementation of common data structures, introductory algorithm analysis and object oriented design. Additional topics will be chosen from networking, artificial intelligence and parallel processing. *Staff.*

Spring

COMPUTER SCIENCE 210 (3)—Computer Organization

Prerequisite: Computer Science 111. Multilevel machine organization studied at the levels of digital logic, microprogramming, conventional machine, operating system, and assembly language. *Staff.*

Fall

COMPUTER SCIENCE 211 (3)—Data Structures and Algorithms

Prerequisites: Computer Science 201 and Mathematics 121. Computer representations of data structures as derived from mathematical models: stacks, queues, linked lists. Access methods into data structures, such as hashing and tree searching. Storage allocation and deallocation procedures. Algorithms for manipulating such structures are introduced, analyzed, and implemented by the student. *Staff.*

Winter

COMPUTER SCIENCE 251 (Engineering 251) (3)—Laboratory Computer Applications

Techniques and application of digital data acquisition and automated experimental control. The course is intended for any science major interested in the use of computers in experimental work. Laboratory course. *Akins.*

Fall

[**COMPUTER SCIENCE 295 (1-3)—Language Laboratory**]

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Permission of instructor. Introduction to a computer language, which will be chosen according to needs of students and of other Computer Science courses. Typical languages include Small talk, LISP, PROLOG. May be repeated once for degree credit with permission and if the languages are different. May only be used once toward the major requirements. *Staff.*

COMPUTER SCIENCE 310 (Management 310) (3)—Management Information Systems

Prerequisite: Junior standing. The objective is to build an understanding of the value and uses of information systems for business operations, management decision making, and strategic advantage. Topics include basic systems concepts and major roles of information systems; computer, telecommunications, and database management concepts; management issues in the implementation of information systems including international, security, and ethical considerations. *Cass, Cline.*

Fall, Winter

COMPUTER SCIENCE 312 (3)—Programming Language Design

Prerequisites: Computer Science 201, 210, Mathematics 121. Formal language description tools; Semantic concepts and syntactic constructs appropriate to diverse applications. Comparison of several high-level languages, such as FORTRAN, LISP, PASCAL, PROLOG, and their implementations of these semantic and syntactic elements. *Staff.*

Fall

COMPUTER SCIENCE 313 (3)—Theory of Computation

Prerequisites: Computer Science 201, Mathematics 121, and either Mathematics 102 or 122. A study of the principles of computer science embodied in formal languages, automata, computability, and computational complexity. Topics include context-free grammars, Turing machines, and the halting problem. *Staff.*

Winter

[**COMPUTER SCIENCE 315 (3)—Artificial Intelligence**]

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Computer Science 211. Basic concepts of robotics, theorem proving, natural language processing and intelligent systems. *Lambert.*

[COMPUTER SCIENCE 317 (3)—Database Management]

(Offered when interest is expressed and departmental resources permit.) Prerequisites: Computer Science 210 and 211. Entity-relationship, network, hierarchical, and relational database models. Theory of functional dependencies and normal forms for relational database design. A major project to design and implement a database using a commercial package. *Whaley*.

[COMPUTER SCIENCE 320 (3)—Parallel Computing]

(Offered when interest is expressed and departmental resources permit.) Prerequisites: Computer Science 120, 210, and 211. A survey of parallel computing including hardware, parallel algorithms, and parallel programming. The programming projects emphasize the message-passing paradigm. *Staff*.

[COMPUTER SCIENCE 330 (3)—Operating Systems]

(Offered when interest is expressed and departmental resources permit.) Prerequisites: Computer Science 120 and 211. Procedure initiation, environment construction, re-entrancy, kernel functions, resource management, input/output, file structures, security, process control, semaphores and deadlock, and recovery procedures. The laboratory includes the opportunity to examine and modify the internals of an operating system. *Staff*.

[COMPUTER SCIENCE 332 (3)—Compiler Construction]

(Offered when interest is expressed and departmental resources permit.) Prerequisites: Computer Science 210, 211, 312, and 313. Lexical analysis, parsing, context dependence, translation techniques, optimization. Students are expected to produce a compiler for a suitably restricted language. *Staff*.

[COMPUTER SCIENCE 340 (3)—Interactive Computer Graphics]

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Computer Science 211. A study of the underlying techniques and algorithms used in the display and manipulation of graphics images in an interactive environment. Topics include programming with Motif and the X-window system, two- and three-dimensional viewing and transformations, color models, and realistic rendering of images. A major component of the course is the development and programming of a variety of projects which demonstrate the topics discussed in class. *Vermeer*.

[COMPUTER SCIENCE 395 (1), 396 (2), 397 (3)—Seminar]

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Permission of the instructor. Readings and conferences for a student or students on topics agreed upon with the directing staff. May be repeated for degree credit with permission and if the topics are different. A maximum of six credits may be used toward the major requirements.

COMPUTER SCIENCE 401 (1), 402 (2), 403 (3)—Directed Individual Study

(Offered when interest is expressed and departmental resources permit.) Prerequisite: Permission of the department. Individual conferences. May be repeated for degree credit with permission and if the topics are different.

COMPUTER SCIENCE 423 (3)—Senior Project

The senior project is required of all majors in computer science. Under exceptional circumstances it may be completed during the junior year. The student must obtain approval of a project proposal, from a department member, before registering for this course. The project requires planning, design and implementation of a computer application, in such a way as to integrate the material from other computer science courses and courses outside computer science. Students who have a second major are encouraged to design a project which makes use of material from the other major.

COMPUTER SCIENCE 493 (3-3)—Honors Thesis

Prerequisites: Senior standing and honors candidacy. *Staff*.
Fall-Winter

EAST ASIAN LANGUAGES AND LITERATURES

(See Chinese, Japanese, and Literature in Translation)

The Department of East Asian Languages and Literatures does not offer a major, but two years of Chinese or Japanese are required as part of the East Asian Studies major (see entry under that heading).

Students are urged to begin their East Asian language study as early as possible, preferably in their freshman year.

Chinese and Japanese language students may apply for participation in Washington and Lee's exchange programs in Hong Kong and Japan. By arrangement with the University of Massachusetts, qualified students of Chinese may study for the summer in Taiwan and/or may spend a semester or an academic year or both in Taiwan or in the People's Republic of China.
