List of Group I courses for Computer Science Major

CS Majors are required to take four courses from this list, including at least one with an asterisk "*". Courses with a "*" are considered Group IA. All courses below (those with an "*" and those without) meet Group IB requirements.

*CS410  Introduction to Computer Graphics [4 cr.]
Prerequisite: MATH229 or MATH369, CS253.
Graphics hardware and software. Drawing simple objects. Coordinate transformations in 2D and 3D. Modeling and viewing complex 2D and 3D objects.

*CS414  Object-oriented Design [4 cr.]
Prerequisite: CS314.
Object-oriented methods for large-scale software systems. Software design for reuse using patterns. WWW applications in languages such as Java.

CS420  Introduction to the Analysis of Algorithms [4 cr.]
Prerequisite: CS320.
Efficiency analysis, correctness proofs, design strategies, illustrations from domains such as graph theory, scheduling and optimization, geometry.

CS425 Introduction to Bioinformatic Algorithms [4 cr.]
Prerequisite: CS320 with a C or better.
Algorithms for analysis of large scale biological data.

CS430  Database Systems [4 cr.]
Prerequisite: CS314.
Database analysis, design, administration, implementation, hierarchical, network relational models; data sub-languages; query facilities.

*CS440  Introduction to Artificial Intelligence [4 cr.]
Prerequisite: CS253, CS320.
Concepts, representations, and algorithms for applications of problem solving search, logical reasoning and machine learning.

CS453  Introduction to Compiler Construction [4 cr.]
Prerequisite: CS253, CS314.
Functional components of a compiler: modules, interfaces, lexical and syntax analysis, error recovery, resource allocation, code generation.

*CS 454 Principles of Programming Languages [4 cr.]
Prerequisite: CS253, CS320
Language design concepts; functional programming; interpreter support for environments, procedures, recursion, types, objects; language paradigms.
*CS455  Introduction to Distributed Systems [4 cr.]
Prerequisite: CS 370.
Fundamentals of distributed systems: currency, thread pools, scalable servers, graphs, data
formats, transactions, secure systems, and overlays.

CS457  Computer Networks and the Internet [4 cr.]
Prerequisite: CS370, CS253, STAT301 or STAT315.
Principles of communications, local area networks, communications protocols, TCP/IP, and the
Internet.

*CS464  Principles of Human-Computer Interaction [4 cr.]
Prerequisite: CS253
History and trends in human-computer interaction; user-centered design techniques; prototyping;
experimental methods for the evaluation of technology.

CS470  Computer Architecture [4 cr.]
Prerequisite: CS370.
Instruction sets. Control unit: hardwired and microprogramming. Memory systems.
RISC processors.

*CS475  Parallel Programming [4 cr.]
Prerequisite: CS370.
Parallel programming techniques for shared-memory and message-passing systems; process
synchronization, communication; example languages.