Breadth Course Requirement

The purpose of the Breadth Course Requirement is to expose students to diverse Computer Science research topics and methods. PhD students must take a total of five (5) courses with at least one course in each different breadth area. PhD students must have an average GPA of 3.45 or higher for the five courses they use to satisfy the Breadth Course Requirement. Students have three (3) years to satisfy this requirement. If students want to take a more advanced course in a sub-area than the listed options – typically, one for which one of the listed options is a prerequisite – they may petition the Director of Graduate Studies to use this course for satisfying the requirement. Students may petition the Director of Graduate Studies to transfer credit for up to two courses to use for satisfying the Breadth Course Requirement.

Master’s students (MS and MCS) are required to take three (3) courses, one from each of the areas. Students must maintain an overall GPA of 3.0 for MCS and 3.25 for MS candidates for all courses on their degree program, as well as those used to satisfy the breadth requirement. Substitutions are rarely permitted and transfer courses will not count towards the breadth requirement. All courses must be taken for graduate credit and on the A-F grading basis.

Breadth Areas

Theory and Algorithms
5302: Analysis of Numerical Algorithms
5304: Computational Aspects of Matrix Theory
5403: Computational Complexity
5421: Advanced Algorithms & Data Structures
5481: Computational Techniques for Genomics
5525: Machine Learning

Architecture, Systems, and Software
5103: Operating Systems
5104: System Modeling and Performance Evaluation
5105: Introduction to Distributed Systems
5106: Programming Languages
5161: Introduction to Compilers
5204: Advanced Computer Architecture
5211: Data Communications and Computer Networks
5221: Foundations of Advanced Networking
5231: Wireless and Sensor Networks
5451: Introduction to Parallel Computing: Architectures, Algorithms, and Programming
5708: Architecture and Implementation of Database Management Systems
5801: Software Engineering I
5802: Software Engineering II

Applications
5115: User Interface Design, Implementation and Evaluation
5125: Collaborative and Social Computing
5271: Introduction to Computer Security
5461: Functional Genomics, Systems Biology, and Bioinformatics
5471: Modern Cryptography
5511: Artificial Intelligence I
5512: Artificial Intelligence II
5521: Introduction to Machine Learning
5523: Introduction to Data Mining
5551: Introduction to Intelligent Robotic Systems
5561: Computer Vision
5607: Fundamentals of Computer Graphics I
5608: Fundamentals of Computer Graphics II
5609: Visualization
5611: Motion and Planning in Games
5619: Virtual Reality and 3D User Interaction
5707: Principles of Database Systems

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