Department of Computer Science

Computer Science Course Descriptions

CIS 195, 295, 395, 495 – Special Topics (1-12)

CIS 198, 298, 398, 498 – Tutorial (1-3)

CIS 105 – Introduction to Computing (3) An introduction to computing and problem solving, including software productivity tools, computing fundamentals, and an introduction to programming. Laboratory work included. Gen Ed: FM credit. Fall and Spring.

CIS 125 – Statistics (3) Variability, uncertainty, description of data, sampling, hypothesis testing, correlation and regression. Not open to students who have completed another entry-level statistics course. Prerequisite: high school algebra or equivalent. Gen Ed: FM credit. As warranted.

CIS 201 – Computer Science I (4) Introduction to computer science and information systems. Data types, control structures, arrays, and objects. Introduction to software engineering. Laboratory required. 1 credit hour FS Recitation option. Prerequisite: MATH 141 or 151 or concurrent registration. Gen Ed: FM credit, FS credit for course if taken with Recitation option. Fall and Spring.

CIS 203 – Computer Science II (4) Data and mathematical structures: algorithms, basic data types, arrays, linear lists, linked lists, stacks, queues, trees. Introduction to object-oriented programming. Recursion. Laboratory required. Prerequisite: CIS 201. Fall and Spring.

CIS 217 – Language and Symbolic Logic (3) Relation of language, logic and theory of logical analysis; axiomatic development of elementary logistic system; consistency, completeness and independence. Cross-listed as PHIL 217. As warranted.

CIS 280 – Selected Languages (1) Topics not normally covered by regular course offerings. Emphasis on selected languages. May be repeated for up to 3 credits with different languages. Prerequisite: CIS 203. Graded S/U only. As warranted.

CIS 280A – Selected Languages (1) Topics not normally covered by regular course offerings. Emphasis on selected languages. May be repeated for up to 3 credits with different languages. Prerequisite: CIS 203. Graded S/U only. As warranted.

CIS 280B – Selected Languages (1) Topics not normally covered by regular course offerings. Emphasis on selected languages. May be repeated for up to 3 credits with different languages. Prerequisite: CIS 203. Graded S/U only. As warranted.

CIS 280C – Selected Languages (1) Topics not normally covered by regular course offerings. Emphasis on selected languages. May be repeated for up to 3 credits with different languages. Prerequisite: CIS 203. Graded S/U only. As warranted.

CIS 300 – Foundations of Computer Science (4) An introduction to the logical and quantitative foundations of computer science. Topics include introductions to: formal proof techniques; logic, sets, relations, partial order, number systems, combinatorics, graphs and trees, and matrix arithmetic. Prerequisite: CIS 201. Spring.

CIS 301 – Theory of Computation (3) Regular and context-free languages, turing machines, and the halting problem. Prerequisites: CIS 203, CIS 300. Fall.

CIS 303 – Algorithm Analysis and Design (3) Analysis and design of algorithms on data structures, including algorithms for processing graphs, trees and strings. Introduction to the theory of algorithm complexity. Prerequisites: CIS 203 and 300. Spring.

CIS 310 – Operating Systems (3) Principles of operating systems concurrency, scheduling, virtual memory, device management, security and protection, deadlocks, introduction to networking. Prerequisite: CIS 203. Fall.

CIS 326 – Computer Simulation (3) Computer sampling from probability distributions, queuing theory, data collection and manipulation, computer programming techniques and organization in simulation analysis and validation, and simulation languages. Emphasis on simulation in systems analysis. Prerequisite: CIS 203 and MATH 152. As warranted.

CIS 327 – Numerical Methods (3) Solution of nonlinear equations and interpolation via polynomials and piecewise polynomials. Numerical differentiation and integration. Error analysis. Convergence criteria. Numerical techniques for ordinary differential equations. Prerequisite: MATH 152. As warranted.

CIS 356 – Assembly Language and Computer Architecture (4) Principles of digital systems design, computer organization, and machine and assembly language programming, microprocessor systems and large-scale computer systems. Prerequisite: CIS 203. Fall.

CIS 380 – Professional Practice (3) Seminar. Influence of computer revolution on society: automation, data banks, security, moneyless economy, numeralization and individual depersonalization, privacy. Prerequisites: CIS 203 and upper-division status. Gen Ed: SI credit. Fall.

CIS 405 – Software Engineering (3) An introduction to the creation of large, reliable software systems. Topics include: requirements and specification; formal, object-oriented, and agile methodologies; system design; validation, verification, and testing; quality, reliability, and safety; cost estimation and project metrics; management, maintenance, and reuse; software standards; software engineering tools. Prerequisite: CIS 203. Gen Ed: WI credit. Spring.

CIS 410 – Computer Networks (3) Digital communications, computer networks, protocol families; client-server architecture, network security. Prerequisite: CIS 203. Spring.

CIS 411 – Advanced Operating Systems (3) Design objectives of operating systems. Sequential processes, resource allocation, concurrent process control and communication, processor and memory management, virtual storage, program protection, effect of computer architecture on system design. Human factors interface. Prerequisite: CIS 310. As warranted.

CIS 420 – Database Systems (3) Information and storage and retrieval, data base systems, data modeling and the relational model, normalization, data description languages and SQL. Prerequisite: CIS 203. As warranted.

CIS 421 – Artificial Intelligence (3) Knowledge representation, searching and heuristics. Game and goal trees; graphs. Applications to game playing, theorem proving, pattern recognition and natural language processing. Prerequisite: CIS 203. As warranted.

CIS 428 – Real Time Programming (3) Techniques of interfacing real-world devices with computers and process control programming. Prerequisite: CIS 356. As warranted.

CIS 443 – Programming Languages (3) Comparative study of programming languages. Functional, logic and object-oriented paradigms. Syntactic and semantic issues in language design. Prerequisites: CIS 203. Spring.

CIS 461 – Computer Graphics (3) Two- and three-dimensional computer graphics and graphics systems including command languages and system design. Prerequisites: CIS 203 and 300. As warranted.

CIS 463 – Compiler Construction (3) Constructing translators for computer programming languages. Organization of a compiler, symbol tables, lexical scan, storage allocation, object code generation, error diagnostic and code optimization. Top-down and bottom-up parsing. Compiler generation tools. Prerequisite: CIS 443. As warranted.

CIS 465 – Advanced Computer Organization (3) Logic devices and systems. Micro- and minicomputer architecture, software systems, peripherals and methods for interfacing microcomputers with external devices. Prerequisite: CIS 356. As warranted.

CIS 468 – @Computer Systems Management (3) Seminar. Management and maintenance of networked systems. Configuration, installation, security. As warranted.

CIS 475 – Introduction to Cryptography (3) Mathematical tools for modern cryptography and cryptanalysis including elementary number theory, algebra, and probability theory. Survey of contemporary cipher systems, their security and complexity. Work includes programming projects and mathematics problems appropriate for the subject and level of the student. Prerequisite: CIS 300 or MATH 340. As warranted.

CIS 480 – Senior Project (3-6) Students perform a research project or substantial programming project under supervision of faculty. Project proposals, journals and formal reports are expected. Team projects are encouraged. Prerequisite: Upper division status; minimum GPA in CS Major requirements of 2.0. Graded S/U only. As warranted.

CIS 485 – @Senior Seminar (3) Current practices and future developments in the broad field of Information Technology. Course will be managed by students under the supervision of a faculty member. Students will be responsible for identifying and inviting presenters, for selecting reading material for the class, and for summarizing and documenting information after the presentation. Prerequisite: Upper-division status. As warranted.

CIS 490 – @Computer Science Internship (1-6) Students work in a real-world environment with business and industry or in conjunction with a member of the CS faculty. A program proposal must be prepared, regular measures of progress taken and reported upon, and a final report developed for presentation. Team projects may be undertaken. Prerequisite: Upper division status; minimum GPA in CS Major requirements of 2.0. Graded S/U only. As warranted.