

Course Schedule - Fall 2006

Computer Science

100 **Freshman Orientation in CS** credit: 1 hours.

Introduction to Computer Science as a field and career for computer science majors. Overview of the field is presented along with specific examples of problem areas and methods of solution. Recommended for all freshman Computer Science majors.

CRN	Type	Section	Time	Days	Location	Instructor
30094	lecture	U	04:00 PM - 04:50 PM	T	room 1320 Digital Computer Laboratory	Kamin, S
30094: Meets 10-Oct-06 - 08-Dec-06.						
30094: This course is for freshmen students, only. This course first meets on Tuesday, October 10, 2006.						

101 **Intro to Computing, Eng & Sci** credit: 3 hours.

Fundamental principles, concepts, and methods of computing, with emphasis on applications in the physical sciences and engineering. Basic problem solving and programming techniques; fundamental algorithms and data structures; use of computers in solving engineering and scientific problems. Credit is not given for both CS 101 and either CS 105 or CS 110 section C. Prerequisite: MATH 220 or MATH 221.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

Students must register for one lab-discussion and one lecture section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
35879	lecture	AL1	01:00 PM - 01:50 PM	MW	room 66 Library - Main	Gambill, T
35879: Quant Reasoning II course.						
35883	lecture	AL2	02:00 PM - 02:50 PM	MW	room 114 David Kinley Hall	Gambill, T
35883: Quant Reasoning II course.						
35886	laboratory- discussion	AYA	09:00 AM - 10:50 AM	M	room L520 Digital Computer Laboratory	Li, C; Gambill, T
35886: Quant Reasoning II course.						
35889	laboratory- discussion	AYB	11:00 AM - 12:50 PM	M	room L520 Digital Computer Laboratory	Gambill, T; Pankaj, B

35889: Quant Reasoning II course.						
35890	laboratory-discussion	AYC	03:00 PM - 04:50 PM	M	room L520 Digital Computer Laboratory	Gambill, T; Pankaj, B
35890: Quant Reasoning II course.						
35893	laboratory-discussion	AYD	09:00 AM - 10:50 AM	T	room L520 Digital Computer Laboratory	Li, C; Gambill, T
35893: Quant Reasoning II course.						
35896	laboratory-discussion	AYE	03:00 PM - 04:50 PM	T	room L520 Digital Computer Laboratory	Gambill, T; Gao, J
35896: Quant Reasoning II course.						
35899	laboratory-discussion	AYF	09:00 AM - 10:50 AM	W	room L520 Digital Computer Laboratory	Jin, J; Gambill, T
35899: Quant Reasoning II course.						
35902	laboratory-discussion	AYG	11:00 AM - 12:50 PM	W	room L520 Digital Computer Laboratory	Gambill, T; Gammer, I
35902: Quant Reasoning II course.						
35907	laboratory-discussion	AYH	03:00 PM - 04:50 PM	W	room L520 Digital Computer Laboratory	Gambill, T; Gammer, I
35907: Quant Reasoning II course.						
35910	laboratory-discussion	AYI	01:00 PM - 02:50 PM	R	room L520 Digital Computer Laboratory	Gambill, T; Gao, J
35910: Quant Reasoning II course.						
35913	laboratory-discussion	AYJ	03:00 PM - 04:50 PM	R	room L520 Digital Computer Laboratory	Jin, J; Gambill, T
35913: Quant Reasoning II course.						
35915	laboratory-discussion	AYK	10:00 AM - 11:50 AM	F	room L520 Digital Computer Laboratory	Gambill, T; Bengtson, E
35915: Quant Reasoning II course.						

35918	laboratory-discussion	AYL	12:00 PM - 01:50 PM	F	room L520 Digital Computer Laboratory	Gambill, T; Bengtson, E
35918: Quant Reasoning II course.						

105 **Intro to Computing, Non-Tech** credit: 3 hours.

Introduction to computing as an essential tool of academic and professional activities in disciplines other than science and engineering. Functions and interrelationships of computer system components: hardware, systems and applications software, and networks. Widely used application packages such as spreadsheets and databases. Concepts and practice of programming for the solution of simple problems in different application areas. Students interested in scientific and engineering applications of computing should take CS 101 instead of this course. Prerequisite: MATH 012 or equivalent. Credit is not given for both CS 105 and CS 101.

This course satisfies the General Education Criteria for a Quant Reasoning I course.

Students must register for one lab-discussion and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
35823	lecture	AL1	09:00 AM - 09:50 AM	MW	room 66 Library - Main	Gambill, T; Woodbury, M
35823: Quant Reasoning I course.						
35824	lecture	AL2	10:00 AM - 10:50 AM	MW	room 66 Library - Main	Gambill, T; Woodbury, M
35824: Quant Reasoning I course.						
35825	lecture	AL3	11:00 AM - 11:50 AM	MW	room 66 Library - Main	Gambill, T; Woodbury, M
35825: Quant Reasoning I course.						
35826	lecture	AL4	12:00 PM - 12:50 PM	MW	room 66 Library - Main	Gambill, T; Woodbury, M
35826: Quant Reasoning I course.						
47173	laboratory-discussion	AYA	02:00 PM - 02:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Parr, D
47173: Quant Reasoning I course.						
47174	laboratory-discussion	AYB	03:00 PM - 03:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Chen, F
47174: Quant Reasoning I course.						
35827	laboratory-discussion	AYC	04:00 PM - 04:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Negara, S

35827: Quant Reasoning I course.						
35828	laboratory-discussion	AYD	05:00 PM - 05:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Chen, F
35828: Quant Reasoning I course.						
35829	laboratory-discussion	AYE	06:00 PM - 06:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Negara, S
35829: Quant Reasoning I course.						
35830	laboratory-discussion	AYF	07:00 PM - 07:50 PM	W	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Yasmeen, A
35830: Quant Reasoning I course.						
35831	laboratory-discussion	AYG	09:00 AM - 09:50 AM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Lauterburg, S
35831: Quant Reasoning I course.						
35832	laboratory-discussion	AYH	10:00 AM - 10:50 AM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Lauterburg, S
35832: Quant Reasoning I course.						
35833	laboratory-discussion	AYI	11:00 AM - 11:50 AM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Lauterburg, S
35833: Quant Reasoning I course.						
35835	laboratory-discussion	AYJ	12:00 PM - 12:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Su Thompson, R
35835: Quant Reasoning I course.						
35836	laboratory-discussion	AYK	01:00 PM - 01:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Lee, E
35836: Quant Reasoning I course.						
35837	laboratory-discussion	AYL	02:00 PM - 02:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Lee, E
35837: Quant Reasoning I course.						
35838	laboratory-discussion	AYM	03:00 PM - 03:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Parr, D
35838: Quant Reasoning I course.						

35840	laboratory-discussion	AYN	04:00 PM - 04:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Parr, D
35840: Quant Reasoning I course.						
35843	laboratory-discussion	AYO	05:00 PM - 05:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Jain, A
35843: Quant Reasoning I course.						
35847	laboratory-discussion	AYP	06:00 PM - 06:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Jain, A
35847: Quant Reasoning I course.						
35849	laboratory-discussion	AYQ	07:00 PM - 07:50 PM	R	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Hilldore, B
35849: Quant Reasoning I course.						
47175	laboratory-discussion	AYR	09:00 AM - 09:50 AM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Gilbert, E
47175: Quant Reasoning I course.						
35851	laboratory-discussion	AYS	10:00 AM - 10:50 AM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Gilbert, E
35851: Quant Reasoning I course.						
35854	laboratory-discussion	AYT	11:00 AM - 11:50 AM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Su Thompson, R
35854: Quant Reasoning I course.						
35856	laboratory-discussion	AYU	12:00 PM - 12:50 PM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Su Thompson, R
35856: Quant Reasoning I course.						
35858	laboratory-discussion	AYV	01:00 PM - 01:50 PM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Hilldore, B
35858: Quant Reasoning I course.						
35873	laboratory-discussion	AYW	02:00 PM - 02:50 PM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Meredith, P
35873: Quant Reasoning I course.						

47176	laboratory-discussion	AYX	03:00 PM - 03:50 PM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Meredith, P
47176: Quant Reasoning I course.						
47178	laboratory-discussion	AYY	04:00 PM - 04:50 PM	F	room 70B Wohlers Hall	Gambill, T; Woodbury, M; Yasmeen, A
47178: Quant Reasoning I course.						

110 **Programming Laboratory** credit: 1 hours.

Practical laboratory course in the methods used and skills required for writing and maintaining well-structured software. Extensive practice with a programming language is provided. Different sections use different programming languages. An existing knowledge of fundamental computing principles is assumed. Three laboratory hours per week. Credit is not given for studying any given language more than once. (That is, a given section may be taken only once.) Credit is not given for both CS 110 section C and CS 101, both CS 110 section J and CS 125, or both CS 110 section CP and CS 225. Prerequisite: One of CS 101, CS 105, or CS 125; or consent of instructor. It is recommended that students enrolling in CS 110 section CP have prior C programming experience or credit for CS 110 section C.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

125 **Intro to Computer Science** credit: 4 hours.

First course for computer science majors and other students with a deep interest in computing. The course introduces students to basic concepts in computing and fundamental techniques for solving computational problems. Prerequisite: Three years of high school mathematics or MATH 012.

This course satisfies the General Education Criteria for a Quant Reasoning I course.

Students must register for one lab-discussion and one lecture section. Engineering students must obtain a dean's approval to drop this course after the second week of instruction.

CRN	Type	Section	Time	Days	Location	Instructor
35876	lecture	AL1	02:00 PM - 02:50 PM	MWF	room 1404 Siebel Center for Comp Sci	Peiper, C
35876: Quant Reasoning I course.						
35878	lecture	AL2	03:00 PM - 03:50 PM	MWF	room 1404 Siebel Center for Comp Sci	Peiper, C
35878: Quant Reasoning I course.						
35881	laboratory-discussion	AYA	09:00 AM - 10:50 AM	T	room 1214 Siebel Center for Comp Sci	Peiper, C

35881: Quant Reasoning I course.						
35885	laboratory-discussion	AYB	11:00 AM - 12:50 PM	T	room 1214 Siebel Center for Comp Sci	Peiper, C
35885: Quant Reasoning I course.						
35888	laboratory-discussion	AYC	01:00 PM - 02:50 PM	T	room 1214 Siebel Center for Comp Sci	Peiper, C
35888: Quant Reasoning I course.						
35891	laboratory-discussion	AYD	03:00 PM - 04:50 PM	T	room 1214 Siebel Center for Comp Sci	Peiper, C
35891: Quant Reasoning I course.						
35898	laboratory-discussion	AYE	09:00 AM - 10:50 AM	W	room 1214 Siebel Center for Comp Sci	Peiper, C
35898: Quant Reasoning I course.						
35906	laboratory-discussion	AYH	11:00 AM - 12:50 PM	W	room 1214 Siebel Center for Comp Sci	Peiper, C
35906: Quant Reasoning I course.						
35908	laboratory-discussion	AYI	03:00 PM - 04:50 PM	W	room 1214 Siebel Center for Comp Sci	Peiper, C
35908: Quant Reasoning I course.						

173 **Discrete Structures** credit: 3 hours.

Studies discrete mathematical structures frequently encountered in the study of Computer Science. Topics will include sets, propositions, boolean algebra, induction, recursion, relations, functions, and graphs. Credit is not given for both CS 173 and MATH 213.

CRN	Type	Section	Time	Days	Location	Instructor
30102	lecture-discussion	M	09:30 AM - 10:45 AM	TR	room 1404 Siebel Center for Comp Sci	Heeren, C

196 **Freshman Honors Course in CS** credit: 1 hours.

Course is offered for honors credit in conjunction with other 100-level computer science courses, in which concurrent registration is required. Enrollment is strictly limited to beginning students with superior talents

in computer science. A special examination may be required for admission to this course. May be repeated.
 Prerequisite: Concurrent registration in another 100-level computer science course (see Schedule); or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
31507	lecture-discussion	1	ARRANGED			Gambill, T
31507: SECTION 1 is for students registered in CS 101						
31508	lecture-discussion	25	ARRANGED			Peiper, C
31508: SECTION 25 is for students registered in CS 125						
31509	lecture-discussion	5	ARRANGED			Woodbury, M
31509: SECTION 5 is for students registered in CS 105						
31510	lecture-discussion	73	ARRANGED			Heeren, C
31510: SECTION 73 is for students registered in CS 173						

199 **Undergraduate Open Seminar** credit: 1 to 5 hours.
 May be repeated.

CRN	Type	Section	Time	Days	Location	Instructor
42790	lecture-discussion	A	05:00 PM - 05:50 PM	T		Kamin, S
42790: Meets 17-Oct-06 - 08-Dec-06.						
42790: 1 hours Topic: Intro to Programming This course begins on Tuesday, Oct. 17 in lab 0220, Siebel Center.						

210 **Ethical & Prof'l Issues in CS** credit: 2 hours.
 Ethics for the computing profession. Ethical decision-making; licensing; intellectual property, freedom of information, and privacy. Students will be required to make oral presentations. Credit is not given for both CS 210 and ECE 316.
 Prerequisite: CS 225 and junior standing.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

31516	lecture-discussion	1	12:00 PM - 01:50 PM	M	room 1103 Siebel Center for Comp Sci	Woodbury, M; Cozzie, A
31517	lecture-discussion	2	03:00 PM - 04:50 PM	M	room 1103 Siebel Center for Comp Sci	Woodbury, M; Cozzie, A
43359	lecture-discussion	3	12:00 PM - 01:50 PM	W	room 1103 Siebel Center for Comp Sci	Woodbury, M; Cozzie, A
43360	lecture-discussion	4	03:00 PM - 04:50 PM	W	room 1103 Siebel Center for Comp Sci	Woodbury, M; Cozzie, A

225 **Data Structure & Softw Prin** credit: 4 hours.

Data abstractions: elementary data structures: lists, stacks, queues, trees; searching and sorting techniques.

Introduction to the principles of software engineering including term programming project. Prerequisite: CS 125 or ECE 190; CS 173 or MATH 213; or consent of instructor.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

Students must register for one lecture-discussion and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
35917	lecture	AL1	12:00 PM - 12:50 PM	MWF	room 1404 Siebel Center for Comp Sci	Heeren, C
35917: Quant Reasoning II course.						
35919	lecture	AL2	01:00 PM - 01:50 PM	MWF	room 1404 Siebel Center for Comp Sci	Heeren, C
35919: Quant Reasoning II course.						
35923	laboratory-discussion	AYA	01:00 PM - 02:50 PM	W	room 1214 Siebel Center for Comp Sci	Heeren, C
35923: Quant Reasoning II course.						
35944	laboratory-discussion	AYC	09:00 AM - 10:50 AM	R	room 1214 Siebel Center for Comp Sci	Heeren, C
35944: Quant Reasoning II course.						
35947	laboratory-discussion	AYD	11:00 AM - 12:50 PM	R	room 1214 Siebel Center for Comp Sci	Heeren, C

35947: Quant Reasoning II course.						
35950	laboratory-discussion	AYE	01:00 PM - 02:50 PM	R	room 1214 Siebel Center for Comp Sci	Heeren, C
35950: Quant Reasoning II course.						
35952	laboratory-discussion	AYF	03:00 PM - 04:50 PM	R	room 1214 Siebel Center for Comp Sci	Heeren, C
35952: Quant Reasoning II course.						
35954	laboratory-discussion	AYG	09:00 AM - 10:50 AM	F	room 1214 Siebel Center for Comp Sci	Heeren, C
35954: Quant Reasoning II course.						
35956	laboratory-discussion	AYH	11:00 AM - 12:50 PM	F	room 1214 Siebel Center for Comp Sci	Heeren, C
35956: Quant Reasoning II course.						
35959	laboratory-discussion	AYI	01:00 PM - 02:50 PM	F	room 1214 Siebel Center for Comp Sci	Heeren, C
35959: Quant Reasoning II course.						
35960	laboratory-discussion	AYJ	03:00 PM - 04:50 PM	F	room 1214 Siebel Center for Comp Sci	Heeren, C
35960: Quant Reasoning II course.						

231 **Computer Architecture I** credit: 3 hours.

Introduction to computer architecture, working up from the logic gate level: combinational and sequential networks; computer arithmetic; arithmetic/logic units; memory organization; control unit design. Credit is not given for both CS 231 and ECE 290. Prerequisite: CS 125.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

CRN	Type	Section	Time	Days	Location	Instructor
30105	lecture	X	11:00 AM - 11:50 AM	MW	room 1404 Siebel Center for Comp Sci	Kale, L; Harrison, W
30105: Quant Reasoning II course.						

30105: A review session will be held each week at 11:00 on Friday, 1404 Siebel Center. Students should adjust their schedule accordingly.

232 Computer Architecture II credit: 3 hours.

Second-level course in computer architecture: machine-level programming, instruction sets, data representations; subroutines; input/output hardware and software; linking and loading; relation to high-level languages. Credit is not given for both CS 232 and ECE 390. (Counts for advanced hours in LAS.) Prerequisite: CS 231.

Students must register for one lab and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
35966	laboratory	AB1	10:00 AM - 10:50 AM	M	room 1214 Siebel Center for Comp Sci	Kumar, V; Zilles, C
35968	laboratory	AB2	12:00 PM - 12:50 PM	M	room 1214 Siebel Center for Comp Sci	Kumar, V; Zilles, C
35971	laboratory	AB3	02:00 PM - 02:50 PM	M	room 1214 Siebel Center for Comp Sci	Kumar, V; Zilles, C
35973	laboratory	AB4	04:00 PM - 04:50 PM	M	room 1214 Siebel Center for Comp Sci	Kumar, V; Zilles, C
35963	lecture	AL1	02:00 PM - 02:50 PM	WF	room 1310 Digital Computer Laboratory	Kumar, V; Zilles, C

241 System Programming credit: 3 hours.

Introduction to systems programming: This course will cover the basics of system programming, including POSIX processes, process control, inter-process communication, synchronization, signals, simple memory management, file I/O and directories, shell programming, socket network programming, RPC programming in distributed systems, basic security mechanisms, and standard tools for systems programming such as debugging tools. Prerequisite: CS 225; CS 232 or ECE 390.

CRN	Type	Section	Time	Days	Location	Instructor
45300	lecture-discussion	SP1	09:00 AM - 09:50 AM	MWF	room 1404 Siebel Center for Comp Sci	Campbell, R; Zhou, Y; Thompson, N; Angrave, L
46648	lecture-discussion	SP2	10:00 AM - 10:50 AM	MWF	room 1404 Siebel Center for Comp Sci	Campbell, R; Zhou, Y; Thompson, N; Angrave, L

242 **Programming Studio** credit: 3 hours.

Intensive programming lab intended to strengthen skills in programming. Prerequisite: CS 241.

CRN	Type	Section	Time	Days	Location	Instructor
45328	laboratory	AB1	ARRANGED		room ARR Siebel Center for Comp Sci	Woodley, M
45325	lecture	AL1	04:00 PM - 04:50 PM	W	room 1404 Siebel Center for Comp Sci	Woodley, M

257 **Numerical Methods** credit: 3 hours.

Introduction to numerical methods for students in science and engineering; topics include floating-point computation, systems of linear equations, approximation of functions and integrals, the single nonlinear equation, and the numerical solution of ordinary differential equations; discusses various applications in science and engineering; includes some programming as well as the use of high quality mathematical library routines. Same as MATH 257. Students with earned credit in CS 450 may not receive additional credit for CS 257 or MATH 257. (Counts for advanced hours in LAS.) Prerequisite: A 100-level computer science course; MATH 225 or MATH 415; MATH 241 (formerly MATH 243) or MATH 242.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

CRN	Type	Section	Time	Days	Location	Instructor
36131	lecture- discussion	M	12:30 PM - 01:45 PM	WF	room 1320 Digital Computer Laboratory	Olson, L
36131: Quant Reasoning II course.						

273 **Intro to Theory of Computation** credit: 3 hours.

Finite automata and regular languages; pushdown automata and context-free languages; Turing machines and recursively enumerable sets; computability and the halting problem; undecidable problems. Prerequisite: CS 125 and either CS 173 or MATH 213.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

CRN	Type	Section	Time	Days	Location	Instructor
30107	lecture- discussion	P	12:30 PM - 01:45 PM	TR	room 1320 Digital Computer Laboratory	Fleck, M; Parthasarathy, M
30107: Quant Reasoning II course.						

296 **Honors Course in CS** credit: 1 hours.

Group projects for honors work in computer science. Sections of this course are offered in conjunction with other 200-level computer science courses, in which concurrent registration is required. A special examination may be required for admission to this course. May be repeated. Prerequisite: Concurrent registration in another 200-level computer science course (see Schedule); or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
31518	lecture-discussion	25	ARRANGED			Heeren, C
31518: Section 25 is for students registered in CS 225						
31519	lecture-discussion	31	ARRANGED			Kale, L; Harrison, W
31519: Section 31 is for students registered is CS 231						
31520	lecture-discussion	32	ARRANGED			Kumar, V; Zilles, C
31520: Section 32 is for students registered in CS 232						
31521	lecture-discussion	57	ARRANGED			Olson, L
31521: Section 57 is for students registered in CS 257						
31522	lecture-discussion	73	ARRANGED			Fleck, M; Parthasarathy, M
31522: Section 73 is for students registered in CS 273						

397 **Individual Study** credit: 1 to 3 hours.
May be repeated. Prerequisite: 100-level computer science course; consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10464	independent study		ARRANGED			
10464: Instructor Approval Required						
10464: Students must see the CS Department to receive the appropriate CRN for the instructor.						

398 **Special Topics in CS** credit: 2 to 4 hours.
Lecture course in topics of current interest. See Schedule for current topics. May be repeated. Prerequisite: As specified for each topic offering; see Schedule or departmental course description.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

400 **Data Structures, Non-CS Majors** credit: 4 hours.

Course integrates software engineering principles with data structures implemented in C++. While prior experience with either C, C++ or Java is assumed, C++ will be taught in the first three weeks of the course. Software engineering will be covered in three stages: personal software process (checkpoints, project plans, defects, and code reviews), prior to coding (process models, requirements, and design) and after coding (testing and quality assurance techniques). The concepts, principles, and use of data structures will include pointers, lists, arrays, sets, stacks, trees, hashing, graphs, priority queues, and sorting. Special emphasis will be placed on the implementations of these structures in real-world applications. Same as CSE 400. Credit is not given for both CS 400 and CS 225. Computer Science and Computer Engineering majors may not receive credit for CS 400. Prerequisite: CS 101 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

410 **Intro to Text Info Systems** credit: 3 or 4 hours.

Introduction to the theory, design, and implementation of text-based information systems. Text analysis, retrieval models (e.g., Boolean, vector space, probabilistic), text categorization, text filtering, clustering, retrieval system design and implementation, and applications to web information management. Same as LIS 410. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or CS 400 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

411 **Database Systems** credit: 3 or 4 hours.

Examines the logical organization of databases: the entity-relationship model; the hierarchical, network, and relational data models and their languages. Functional dependencies and normal forms. Design, implementation, and optimization of query languages; security and integrity; concurrency control, and distributed database systems. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or CS 400 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
30109	lecture-discussion	Q3	03:30 PM - 04:45 PM	WF	room 1310 Digital Computer Laboratory	Angrave, L
30109: 3 hours						
40086	lecture-discussion	Q4	03:30 PM - 04:45 PM	WF	room 1310 Digital Computer Laboratory	Angrave, L
40086: 4 hours						

412 **Intro Data Mining** credit: 3 or 4 hours.

Introduction to the concepts, techniques, and systems of data warehousing and data mining, including (1) design and implementation of data warehouse and on-line analytical processing (OLAP) systems; and (2) data mining concepts, methods, systems, implementations, and applications. 3 undergraduate or graduate hours. 4 graduate hours. Prerequisite: CS 225 or CS 500; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
48711	lecture-discussion	ADD	ARRANGED		room ARR Siebel Center for Comp Sci	Han, J
48711: 3 hours Students registered in this section will watch the regular CS 412 lecture, online. This is an overflow accommodation for the course. Students in this section would take the regular midterm and final exams with the regular section of CS 412.						
43357	lecture-discussion	P3	12:30 PM - 01:45 PM	WF	room 1310 Digital Computer Laboratory	Han, J
43357: 3 hours						
43358	lecture-discussion	P4	12:30 PM - 01:45 PM	WF	room 1310 Digital Computer Laboratory	Han, J
43358: 4 hours						

413 **Intro to Combinatorics** credit: 3 or 4 hours.
Same as MATH 413. See MATH 413.

This course satisfies the General Education Criteria for a Quant Reasoning II course.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

414 **Multimedia Systems** credit: 3 or 4 hours.

Organization and structure of modern multimedia systems; audio and video encoding; quality of service concepts; scheduling algorithms for multimedia within OS and networks multimedia protocols over high-speed networks; synchronization schemes, user-interface design; multimedia teleservices. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 241 or CS 423.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

417 **Computer-Assisted Instruction** credit: 4 hours.
Same as CI 435. See CI 435.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

418 **Computer Graphics** credit: 3 or 4 hours.

Introduction to basic mathematical tools and computational techniques for modeling, rendering, and animating 3-D scenes. Same as CSE 427. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or CS 400; MATH 225 or MATH 241 (formerly MATH 243) or MATH 242.

CRN	Type	Section	Time	Days	Location	Instructor
36119	lecture-discussion	P3	03:30 PM - 04:45 PM	TR	room 1404 Siebel Center for Comp Sci	Yu, Y
36119: 3 hours						
36121	lecture-discussion	P4	03:30 PM - 04:45 PM	TR	room 1404 Siebel Center for Comp Sci	Yu, Y
36121: 4 hours						

419 **Advanced Comp Graphics** credit: 3 or 4 hours.

Advanced methods for representing, displaying, and rendering two-, three-, and four-dimensional scenes. General algebraic curves and surfaces, splines, Gaussian and bump-function representation, fractals, particle systems, constructive solid geometry methods, lighting models, radiosity, advanced ray-tracing methods, surface texturing animation techniques, data visualization methods. Same as CSE 428. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 418.

CRN	Type	Section	Time	Days	Location	Instructor
46823	lecture-discussion	C3	10:00 AM - 10:50 AM	MWF	room 1103 Siebel Center for Comp Sci	Forsyth, D
46823: 3 hours						
46824	lecture-discussion	C4	10:00 AM - 10:50 AM	MWF	room 1103 Siebel Center for Comp Sci	Forsyth, D
46824: 4 hours						

420 **Intro to Parallel Programming** credit: 3 or 4 hours.

Introduction to fundamental issues in design and development of parallel programs for various types of parallel computers. Various programming models according to both machine type and application area. Cost models, debugging, and performance evaluation of parallel programs with actual application examples. Same as CSE 402, and ECE 492. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 400 or CS 225; or advanced programming experience.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

421 **Programming Lang and Compilers** credit: 3 or 4 hours.

Introduction to the structure of programming languages and their implementation. Basic language design principles; abstract data types; functional languages; type systems; object-oriented languages. Basics of lexing, parsing, syntax-directed translation, semantic analysis, and code generation. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225; CS 232 or ECE 390.

CRN	Type	Section	Time	Days	Location	Instructor
30128	lecture-discussion	D3	02:00 PM - 03:15 PM	TR	room 1404 Siebel Center for Comp Sci	Gunter, E
30128: 3 hours						
40087	lecture-discussion	D4	02:00 PM - 03:15 PM	TR	room 1404 Siebel Center for Comp Sci	Gunter, E
40087: 4 hours						

422 **Programming Language Design** credit: 3 or 4 hours.

Advanced course in principles of language design. Using imperative and functional programming as unifying themes, major language design paradigms will be explored. Tools in this study will include both practical language processor construction and theoretical models. Emphasis will be on reasoning about programs and languages. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 421.

CRN	Type	Section	Time	Days	Location	Instructor
30132	lecture-discussion	T3	03:30 PM - 04:45 PM	TR	room 1302 Siebel Center for Comp Sci	Rosu, G
30132: 3 hours						
40088	lecture-discussion	T4	03:30 PM - 04:45 PM	TR	room 1302 Siebel Center for Comp Sci	Rosu, G
40088: 4 hours						

423 **Operating Systems Design** credit: 3 or 4 hours.

The organization and structure of modern operating systems and concurrent programming concepts. Deadlock, virtual memory, processor scheduling, and disk systems. Performance, security, and protection. Same as CSE 423. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 241.

CRN	Type	Section	Time	Days	Location	Instructor
36113	lecture-discussion	S3	10:00 AM - 10:50 AM	MWF	room 1304 Siebel Center for Comp Sci	Abdelzaher, T
36113: 3 hours						
36115	lecture-discussion	S4	10:00 AM - 10:50 AM	MWF	room 1304 Siebel Center for Comp Sci	Abdelzaher, T
36115: 4 hours						

424 **Real-Time Systems** credit: 3 or 4 hours.

Examples of real-time computing systems; real-time scheduling and resource management algorithms; analytical and efficient validation methods; examples of real-time operating systems; temporal consistency of real-time data; formal methods for specification of and reasoning about timing constraints. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 431.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

425 **Distributed Systems** credit: 3 hours.

Covers topics needed for a basic understanding of distributed computer systems: Protocols, specification techniques, global states and their determination, reliable broadcast, transactions and commitment, security, and real-time systems. Same as CSE 424 and ECE 428. Prerequisite: CS 241.

CRN	Type	Section	Time	Days	Location	Instructor
48734	lecture-discussion	ADD	ARRANGED		room ARR Siebel Center for Comp Sci	Gupta, I
48734: 3 hours This is a temporary overflow accommodation for CS 425. Students in this section will take the midterm(s) and final exam with the regular CS 425 course.						
36091	lecture-discussion	P	11:00 AM - 12:15 PM	TR	room 1304 Siebel Center for Comp Sci	Gupta, I

426 **Compiler Construction** credit: 3 or 4 hours.

Compiler structure, syntax analysis, syntax-directed translation, automatically constructed recognizers, semantic analysis, code generation, intermediate language, optimization techniques. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 421.

CRN	Type	Section	Time	Days	Location	Instructor
43355	lecture-discussion	N3	12:30 PM - 01:45 PM	TR	room 130 Freer Hall	Padua, D
43355: 3 hours						
43356	lecture-discussion	N4	12:30 PM - 01:45 PM	TR	room 130 Freer Hall	Padua, D
43356: 4 hours						

427 **Software Engineering, I** credit: 3 or 4 hours.

Software process, analysis and design. Topics include: software development paradigms, system engineering, function-based analysis and design, and object-oriented analysis and design. Course will use team-projects for hands-on exercises. Same as CSE 426. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 and CS 273; or consent of instructor.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
36104	lecture-discussion	S3	12:30 PM - 01:45 PM	TR	room 1310 Digital Computer Laboratory	Marinov, D
36104: Advanced Composition course.						
36104: 3 hours						
36107	lecture-discussion	S4	12:30 PM - 01:45 PM	TR	room 1310 Digital Computer Laboratory	Marinov, D
36107: Advanced Composition course.						
36107: 4 hours						

428 **Software Engineering, II** credit: 3 or 4 hours.

Software development, management, and maintenance. Topics include project and configuration management, collaborative development models, software quality assurance, interoperability domain engineering and software reuse, and software re-engineering. Same as CSE 429. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 427.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

429 **Software Engineering II, ACP** credit: 3 hours.

Course is identical to CS 428 except for the additional writing component. See CS 428. Prerequisite: CS 427 Software Engineering, I.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

431 **Embedded Sys Arch and Software** credit: 0 to 4 hours.

Survey of sampled data systems and embedded architecture; overview of the key concepts in common embedded system applications; signal processing and control; embedded microprocessor and device interface; time-critical I/O handling; data communications; real-time operating systems and techniques for the development and analysis of embedded real-time software; hands-on laboratory projects. 3 undergraduate hours only. 3 or 4 graduate hours only. Prerequisite: CS 241 or CS 423.

Students must register for one lab and one lecture section.

CRN	Type	Section	Time	Days	Location	Instructor
40100	laboratory	AB1	10:00 AM - 11:50 AM	T	room ARR Siebel Center for Comp Sci	Sha, L
40101	laboratory	AB2	02:00 PM - 03:50 PM	T	room ARR Siebel Center for Comp Sci	Sha, L
31526	laboratory	AB3	03:00 PM - 04:50 PM	W	room ARR Siebel Center for Comp Sci	Sha, L
40102	laboratory	AB4	05:00 PM - 06:50 PM	W	room ARR Siebel Center for Comp Sci	Sha, L
40667	lecture-discussion	AE3	11:00 AM - 12:15 PM	WF	room 1310 Digital Computer Laboratory	Sha, L
40667: 3 hours						
40668	lecture-discussion	AE4	11:00 AM - 12:15 PM	WF	room 1310 Digital Computer Laboratory	Sha, L
40668: 4 hours						

433 **Computer System Organization** credit: 3 or 4 hours.

Computer system analysis and design. Organizational dependence on computations to be performed. Speed and cost of parts and overall machines. Instruction set design. Pipeline and vector machines. Memory hierarchy design. Same as CSE 422. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 232 or ECE 390.

CRN	Type	Section	Time	Days	Location	Instructor
36069	lecture-discussion	T3	09:30 AM - 10:45 AM	TR	room 1310 Digital Computer Laboratory	Torrellas, J
36069: 3 hours						
43363	lecture-discussion	T4	09:30 AM - 10:45 AM	TR	room 1310 Digital Computer Laboratory	Torrellas, J
43363: 4 hours						

435 **Intro VLSI System Design** credit: 3 hours.

Same as CSE 433 and ECE 425. See ECE 425.

CRN	Type	Section	Time	Days	Location	Instructor
48122	laboratory	AB1	ARRANGED			
36903	lecture	AL1	01:00 PM - 02:20 PM	TR	room 260 Everitt Elec and Comp Engr Lab	Wong, M

437 **VLSI System and Logic Design** credit: 3 or 4 hours.

Computer system design of VLSI chips with emphasis on logic design. Overview of VLSI technology; detailed discussion of recent integrated circuit logic families; types of memories and contemporary logic design methods based on them, including various custom design approaches; automated logic synthesizers; Binary Decision Diagrams; Field Programmable Gate Arrays; hardware/software realization of algorithms; and hardware/software tradeoffs for improving system performance and lowering costs. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 231 or ECE 290 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

438 **Communication Networks** credit: 3 hours.

Layered architectures and the OSI Reference Model; design issues and protocols in the transport, network, and data link layers; architectures and control algorithms of local-area, point-to-point, and satellite networks; standards in networks access protocols; models of network interconnection; overview of networking and communication software. Same as CSE 425 and ECE 438. Prerequisite: CS 241; one of MATH 461, MATH 463, ECE 413.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

36061	lecture-discussion	X	02:00 PM - 03:15 PM	WF	room 1105 Siebel Center for Comp Sci	Borisov, N
36061: 3 hours						

440 **Intro Artificial Intelligence** credit: 3 or 4 hours.

Introductory description of the major subjects and directions of research in artificial intelligence; topics include AI languages (LISP and PROLOG), basic problem solving techniques, knowledge representation and computer inference, machine learning, natural language understanding, computer vision, robotics, and societal impacts. Same as ECE 448. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or ECE 390; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
36047	lecture-discussion	Q3	12:30 PM - 01:45 PM	TR	room 1404 Siebel Center for Comp Sci	Amir, E
36047: 3 hours						
36053	lecture-discussion	Q4	12:30 PM - 01:45 PM	TR	room 1404 Siebel Center for Comp Sci	Amir, E
36053: 4 hours						

443 **Introduction to Robotics** credit: 4 hours.

Same as ECE 470, GE 421, and ME 445. See ECE 470.

CRN	Type	Section	Time	Days	Location	Instructor
36936	laboratory	AB1	01:00 PM - 02:50 PM	T	room 316 Transportation Bldg	Holm, J
36948	laboratory	AB2	01:00 PM - 02:50 PM	R	room 316 Transportation Bldg	Holm, J
41574	laboratory	AB3	03:00 PM - 04:50 PM	T	room 316 Transportation Bldg	Holm, J
36967	lecture	AL1	11:30 AM - 12:50 PM	TR	room 260 Everitt Elec and Comp Engr Lab	Hutchinson, S

446 **Machine Learning & Pattern Rec** credit: 3 or 4 hours.

Organized review of basic theoretical concepts and methods of machine learning and recognition; decision space and linguistic and relational representation of objects; statistical and deterministic recognition algorithms; various types of learning, including adaptive, procedural, and inductive; selected applications; and medical consulting, determination of cost-optimal classification rules, inferential information systems, and computer vision. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 273 and CS 440.

CRN	Type	Section	Time	Days	Location	Instructor
46792	lecture	D3	12:30 PM - 01:45 PM	WF	room 1105 Siebel Center for Comp Sci	Dejong, G
46792: 3 hours						
46793	lecture	D4	12:30 PM - 01:45 PM	WF	room 1105 Siebel Center for Comp Sci	Dejong, G
46793: 4 hours						

450 **Intro to Numerical Analysis** credit: 3 or 4 hours.

Introduction to numerical analysis, including linear system solvers, optimization techniques, interpolation and approximation of functions, solving systems of nonlinear equations, eigenvalue problems, least squares, and quadrature; numerical handling of ordinary and partial differential equations. Same as CSE 401, ECE 491, and MATH 450. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 101 or CS 125; CS 257 or MATH 415; one of MATH 385, MATH 386, MATH 441; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
36016	lecture-discussion	B3	09:00 AM - 09:50 AM	MWF	room 1310 Digital Computer Laboratory	Bond, S
36016: 3 hours						
36020	lecture-discussion	B4	09:00 AM - 09:50 AM	MWF	room 1310 Digital Computer Laboratory	Bond, S
36020: 4 hours						

455 **Numerical Methods for PDEs** credit: 3 or 4 hours.

Introduction to numerical techniques for initial and boundary value problems in partial differential equations; includes finite difference and finite element discretization techniques, direct and iterative solution methods for discrete problems, and programming techniques and usage of FORTRAN packages. Same as CSE 411, and MATH 455. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 257; one of MATH 241 (formerly MATH 243), MATH 380, MATH 385, MATH 386, MATH 441.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

458 **Numerical Linear Algebra** credit: 3 or 4 hours.

Direct and iterative methods for systems of linear equations; over determined systems of equations; eigenvalue problems; nonlinear systems of equations. Same as CSE 412 and MATH 458. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 257 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

459 **Numerical Approx and ODEs** credit: 3 or 4 hours.

Polynomial and spline interpolation; least squares and uniform approximation; numerical differentiation and integration; initial-value and boundary-value problems in ordinary differential equations. Same as CSE 413, and MATH 459. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 257; one of MATH 385, MATH 386, MATH 441; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

462 **Logic Design** credit: 3 hours.

Same as ECE 462 and MATH 491. See ECE 462.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

465 **Princ of User Interface Design** credit: 3 or 4 hours.

This is a project-focused course that covers fundamental principles of user interface design, implementation, and evaluation. Students work in small teams on a semester-long project that includes: analysis of the problem domain, user skills, and tasks; iterative prototyping of interfaces to address user needs; conducting several forms of evaluation such as cognitive walkthroughs and usability tests; and implementation of the final prototype. Students from non-technical disciplines may enroll in the course as non-programmers who participate in all aspects of the projects with the possible exception of implementation. Same as LIS 465. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or CS 400; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
43388	lecture-discussion	M3	12:30 PM - 01:45 PM	WF	room 1131 Siebel Center for Comp Sci	Bailey, B

43388: 3 hours

43389	lecture-discussion	M4	12:30 PM - 01:45 PM	WF	room 1131 Siebel Center for Comp Sci	Bailey, B
43389: 4 hours						

473 **Algorithms** credit: 3 or 4 hours.

Advanced data structures, graph algorithms, arithmetic algorithms, geometric algorithms, string problems, parallel algorithms, NP-completeness. Same as CSE 414 and MATH 473. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 and CS 273; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
43365	lecture-discussion	UG3	11:00 AM - 12:15 PM	TR	room 1404 Siebel Center for Comp Sci	Erickson, J
43365: 3 hours This course is for UNDERGRADUATE students, only. Graduate students that are interested in this area should register for CS 475.						

475 **Formal Models of Computation** credit: 3 or 4 hours.

Finite automata and regular languages; pushdown automata and context-free languages; Turing machines and recursively enumerable sets; linear-bounded automata and context-sensitive languages; computability and the halting problem; undecidable problems; recursive functions; Chomsky hierarchy; computational complexity. Same as MATH 475. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 273 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
35887	lecture-discussion	C3	11:00 AM - 12:15 PM	TR	room 1310 Digital Computer Laboratory	Viswanathan, M
35887: 3 hours						
35895	lecture-discussion	C4	11:00 AM - 12:15 PM	TR	room 1310 Digital Computer Laboratory	Viswanathan, M
35895: 4 hours						

476 **Program Verification** credit: 3 or 4 hours.

Examines formal methods for demonstrating correctness and other properties of programs; includes an overview of predicate calculus. Topics include: invariant assertions, Hoare axiomatics, well-founded orderings for proving termination, structural induction, computational induction, data structures, and parallel programs. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225; CS 273 or MATH 414.

CRN	Type	Section	Time	Days	Location	Instructor
35855	lecture-discussion	D3	09:30 AM - 10:45 AM	TR	room 1103 Siebel Center for Comp Sci	Meseguer, J
35855: 3 hours						
35852	lecture-discussion	D4	09:30 AM - 10:45 AM	TR	room 1103 Siebel Center for Comp Sci	Meseguer, J
35852: 4 hours						

477 **Formal Software Dev Methods** credit: 3 or 4 hours.

Mathematical models, languages, and methods for software specification, development, and verification. Same as ECE 478. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 225 or CS 400; CS 273 or MATH 414.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

484 **Computer Data Acquisition Sys** credit: 3 or 4 hours.

Theory, operation, and design of computer data acquisition systems; analog and digital aspects, conversions between representations, interfacing and systems considerations. 3 undergraduate hours. 3 or 4 graduate hours. Prerequisite: CS 231 or ECE 290; ECE 205 or ECE 440.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

491 **Seminar in Computer Science** credit: 0 to 4 hours.

Seminar course for advanced undergraduate and graduate students. Topics will vary. Approved for S/U grading only. May be repeated to a maximum of 4 hours. May be repeated if topics vary. Prerequisite: Varies with course topic; consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

492 **Senior Project in CS, I** credit: 3 hours.

First part of a project course in computer science. Students work in teams to solve typical commercial or industrial problems. Work involves planning, design, and implementation. Extensive oral and written work is required both on-campus and possibly off-campus at sponsors' locations. Students must enroll for a two term sequence, CS 492 and either CS 493 or CS 494. 3 undergraduate hours. Credit is not given for both CS 492 and a project course in another engineering department for the same project. Prerequisite: Senior standing in CS or consent of instructor.

This course satisfies the General Education Criteria for a Advanced Composition course.

CS 492 and CS 493 are approved for General Education credit only as a sequence. Both courses must be completed to receive Advanced Composition credit.

CRN	Type	Section	Time	Days	Location	Instructor
30139	lecture-discussion	CS	03:00 PM - 04:50 PM	W	room 1109 Siebel Center for Comp Sci	Johnson, R
30139: Advanced Composition course.						

493 **Senior Project in CS II, ACP** credit: 3 hours.

Course is identical to CS 494 except for the additional writing component. See CS 494. 3 undergraduate hours. Students must enroll for a two term sequence, CS 492 and CS 493. Credit is not given for both CS 493 and a project course in another engineering department for the same project. Prerequisite: CS 492.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

494 **Senior Project in CS II** credit: 3 hours.

Continuation of a project course in computer science. Students work in teams to solve typical commercial or industrial problems. Work involves planning, design, and implementation. Extensive oral and written work is required both on-campus and possibly off-campus at sponsors' locations. 3 undergraduate hours. Students must enroll for a two term sequence, CS 492 and either CS 493 or CS 494. Credit is not given for both CS 494 and a project course in another engineering department for the same project. Prerequisite: CS 492.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

498 **Special Topics in CS** credit: 0 to 4 hours.

Lectures in topics of current interest. See Schedule for current topics. Approved for both letter and S/U grading. May be repeated. Prerequisite: As specified for each topic offering, see Schedule or departmental course description.

CRN	Type	Section	Time	Days	Location	Instructor
43753	lecture	CG3	11:00 AM - 12:15 PM	TR	room 1103 Siebel Center for Comp Sci	Hu, Y
43753: 3 hours Topic: Computer Security. Prerequisite: CS 498, Information Assurance. This section is for either undergraduate or graduate students.						
40095	lecture	CG4	11:00 AM - 12:15 PM	TR	room 1103 Siebel Center for Comp Sci	Hu, Y

40095: 4 hoursTopic: Computer Security. Prerequisite: CS 498, Information Assurance. This section is for graduate students only.						
43501	lecture	DP3	11:00 AM - 12:15 PM	WF	room 1131 Siebel Center for Comp Sci	Garzaran, M; Padua, D
43501: 3 hoursTopic: Program Optimization: Prerequisites: CS 232 and CS 225. The course will cover techniques to improve program execution speed and energy consumption. The objective is to prepare students to program future systems where performance improvements will not be, as it was in the past, the direct result of faster clock rates, but must instead be laboriously obtained by applying programming techniques that effectively exploit parallelism and locality. This section is for either undergraduate or graduate students.						
40096	lecture	DP4	11:00 AM - 12:15 PM	WF	room 1131 Siebel Center for Comp Sci	Garzaran, M; Padua, D
40096: 4 hoursTopic: Program Optimization: Prerequisites: CS 232 and CS 225. The course will cover techniques to improve program execution speed and energy consumption. The objective is to prepare students to program future systems where performance improvements will not be, as it was in the past, the direct result of faster clock rates, but must instead be laboriously obtained by applying programming techniques that effectively exploit parallelism and locality. This section is for graduate students only.						
40094	lecture	PR3	09:30 AM - 10:45 AM	WF	room 1111 Siebel Center for Comp Sci	Prabhakaran, M
40094: 3 hoursTopic: Theoretical Foundations of Cryptography This course is an introduction to the theoretical foundations of cryptography. Emphasis will be on rigorous mathematical definitions of security, and proofs of security. Prerequisite: CS 173 and 273 or consent of instructor. Some mathematical maturity will be expected. Familiarity with basic theory of computation and complexity theory will be helpful. This section is for undergraduate or graduate students.						
47171	lecture	PR4	09:30 AM - 10:45 AM	WF	room 1111 Siebel Center for Comp Sci	Prabhakaran, M
47171: 4 hoursTopic: Theoretical Foundations of Cryptography This course is an introduction to the theoretical foundations of cryptography. Emphasis will be on rigorous mathematical definitions of security, and proofs of security. Prerequisite: CS 173 and 273 or consent of instructor. Some mathematical maturity will be expected. Familiarity with basic theory of computation and complexity theory will be helpful. This section is for graduate students only.						
43368	lecture	SH3	11:00 AM - 12:15 PM	WF	room 1302 Siebel Center for Comp Sci	Hinrichs, S
43368: 3 hoursTopic: Introductory Computer Security. Prerequisite: CS 225. This course introduces the fundamental principles of computer and communications security and information assurance. Topics include ethics, privacy, notions of threat, vulnerabilities, and risk in systems, malicious software, data secrecy and integrity issues, network security, and trusted computing. The course will cover mandatory, discretionary, and role-based access control policies as well as certification and accreditation of systems against security standards. Security mechanisms will include authentication, auditing, access control, confidentiality, non-repudiation, cryptography, protocols, availability, intrusion detection, and multilevel secure systems. This section is for undergraduate or graduate students.						

40098	lecture	SH4	11:00 AM - 12:15 PM	WF	room 1302 Siebel Center for Comp Sci	Hinrichs, S
40098: 4 hoursTopic: Introductory Computer Security. Prerequisite: CS 225. This course introduces the fundamental principles of computer and communications security and information assurance. Topics include ethics, privacy, notions of threat, vulnerabilities, and risk in systems, malicious software, data secrecy and integrity issues, network security, and trusted computing. The course will cover mandatory, discretionary, and role-based access control policies as well as certification and accreditation of systems against security standards. Security mechanisms will include authentication, auditing, access control, confidentiality, non-repudiation, cryptography, protocols, availability, intrusion detection, and multilevel secure systems. This section is for graduate students only.						
40091	lecture	SL3	12:30 PM - 01:45 PM	TR	room 1111 Siebel Center for Comp Sci	Lavalle, S
40091: 3 hoursTopic: Planning Algorithms. Prerequisite: CS 473 or consent of instructor. This course provides an introduction to planning algorithms for both discrete and continuous spaces. Issues related to robotics, sensing, motion planning, and control theory will be addressed. A combination of theoretical and implementation issues will be considered. This section is for undergraduate or graduate students.						
40092	lecture	SL4	12:30 PM - 01:45 PM	TR	room 1111 Siebel Center for Comp Sci	Lavalle, S
40092: 4 hoursTopic: Planning Algorithms. Prerequisite: CS 473 or consent of instructor. This course provides an introduction to planning algorithms for both discrete and continuous spaces. Issues related to robotics, sensing, motion planning, and control theory will be addressed. A combination of theoretical and implementation issues will be considered. This section is for graduate students only.						
40093	lecture	SS3	09:30 AM - 10:45 AM	TR	room 1131 Siebel Center for Comp Sci	Sinha, S
40093: 3 hoursTopic: Algorithms in Bioinformatics. Prerequisite: Programming skills such as CS 225 as well as basic probability and statistics. This course will be geared towards undergraduate and Masters level students in computer science. We shall see how state-of-the-art techniques in computer science, especially in sequence analysis and machine learning, are applied to problems in bioinformatics. The student will learn how to formulate important biological problems as computable problems, and develop algorithms to solve such problems efficiently. An application-oriented project will give students hands-on experience with biological data sets. This section is for undergraduate or graduate students.						
43670	lecture	SS4	09:30 AM - 10:45 AM	TR	room 1131 Siebel Center for Comp Sci	Sinha, S
43670: 4 hoursTopic: Algorithms in Bioinformatics. Prerequisite: Programming skills such as CS 225 as well as basic probability and statistics. This course will be geared towards undergraduate and Masters level students in computer science. We shall see how state-of-the-art techniques in computer science, especially in sequence analysis and machine learning, are applied to problems in bioinformatics. The student will learn how to formulate important biological problems as computable problems, and develop algorithms to solve such problems efficiently. An application-oriented project will give students hands-on experience with biological data sets. This section is for graduate students only.						

499 **Senior Thesis in CS** credit: 3 hours.

Research and thesis development experience in computer science. A student works with a faculty member on a mutually agreed upon thesis topic and completes a written thesis. Work involves literature search, oral presentation, analysis and/or implementation, paper preparation, and a written thesis. 3 undergraduate hours. May be repeated to a maximum of 6 hours. Prerequisite: Senior standing in CS and consent of instructor.

This course satisfies the General Education Criteria for a Advanced Composition course.

CRN	Type	Section	Time	Days	Location	Instructor
10465	independent study		ARRANGED			
10465: Advanced Composition course. Instructor Approval Required						
10465: Students must see the CS Department to receive the appropriate CRN for the instructor.						

505 **Numerical Fluid Dynamics** credit: 4 hours.
Same as ATMS 502 and CSE 566. See ATMS 502.

CRN	Type	Section	Time	Days	Location	Instructor
37125	lecture-discussion	A	01:00 PM - 02:30 PM	TR	room 109 Atmospheric Sciences Bldg	Jewett, B

511 **Adv Database Mgt Systems** credit: 4 hours.

Advanced concepts in database management system design and implementation, and an introduction to the major recent developments in the field. Topics include the relational roots, distributed and parallel databases, object databases and extensibility, semistructured data and XML, web research, benchmarks, and current directions in the field. Prerequisite: CS 411.

CRN	Type	Section	Time	Days	Location	Instructor
43351	lecture-discussion	P	02:00 PM - 03:15 PM	WF	room 1304 Siebel Center for Comp Sci	Zhai, C
43351: 4 hours						

512 **Data Mining Principles** credit: 4 hours.

Advanced course on principles and algorithms of data mining. Topics include data cleaning and integration; descriptive and predictive mining; mining frequent, sequential, and structured patterns; clustering, outlier analysis and fraud detection; stream data, web, text, and biomedical data mining; security and privacy in data mining; and research frontiers. Prerequisite: CS 412 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

519 **Scientific Visualization** credit: 4 hours.

Detailed study of visualization techniques useful in analysis of engineering and scientific data. Topics include study of physical models; methods of computational science; two- and three-dimensional data types; visual representation schemes for scalar, vector, and tensor data; isosurface and volume visualization methods; visual monitoring; and interactive steering. Same as CSE 527. Prerequisite: CS 418.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

522 **Programming Language Semantics** credit: 4 hours.

Topics in the theory of programming languages including: functional programming, meta-circular interpreters, typed, untyped and polymorphic lambda-calculi, and denotational semantics. Prerequisite: CS 422 and CS 426.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

523 **Advanced Operating Systems** credit: 4 hours.

Advanced concepts in operating system design and coverage of recent research directions. Resource management for parallel and distributed systems. Interaction between operating system design and computer architectures. Topics include: process management, virtual memory, interprocess communication, context switching, parallel and distributed file system designs, persistent objects, process and data migration, load balancing, security, protection. Term projects. Same as CSE 523. Prerequisite: CS 423, CS 425, and CS 433; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

524 **Concurrent Prog Lang and Sys** credit: 4 hours.

Introduction to the theory of concurrency and concurrent programming languages. Topics include formal models of concurrent computation such as process algebras, nets and actors; high level concurrent programming languages and their operational semantics; and methods for reasoning about correctness and complexity of concurrent programs. Prerequisite: CS 422; CS 475 or CS 476.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

526 **Adv Topics in Compiler Constr** credit: 4 hours.

Advanced topics in compiler construction, including incremental and interactive compiling, error correction, code optimization, models of code generators, etc. Same as CSE 526. Prerequisite: CS 426.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

527 **Adv Topics in Software Eng** credit: 4 hours.

Advanced topics in software engineering, including fault-tolerant software, software architecture, software patterns, multi-media software, and knowledge-based approaches to software engineering. Course also includes a number of case studies. Same as CSE 529. Prerequisite: CS 428 or CS 429 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
35912	lecture-discussion	S	02:00 PM - 03:15 PM	TR	room 1302 Siebel Center for Comp Sci	Johnson, R

533 **Parallel Computer Architecture** credit: 4 hours.

Theoretical aspects of parallel and pipeline computation; time and processor bounds on classes of computations; data alignment network speed and cost bounds; conflict-free access memories; and overall computer system ideas. Same as CSE 522 and ECE 533. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

536 **Design Fault-Tolerant Dig Syst** credit: 4 hours.

Same as ECE 542. See ECE 542.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

541 **Computer Systems Analysis** credit: 4 hours.

Same as CSE 524 and ECE 541. See ECE 541.

CRN	Type	Section	Time	Days	Location	Instructor
35921	lecture-discussion	B	09:30 AM - 10:45 AM	TR	room 1302 Siebel Center for Comp Sci	Sanders, W; Nicol, D

542 **Artificial Neural Networks** credit: 4 hours.

Comprehensive treatment of neural network architectures and learning algorithms balanced with theory and application examples. Prerequisite: CS 440; one of MATH 385, MATH 386, MATH 441; MATH 415; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

543 **Computer Vision** credit: 4 hours.
Same as ECE 549. See ECE 549.

CRN	Type	Section	Time	Days	Location	Instructor
40090	lecture-discussion	A	12:30 PM - 01:45 PM	TR	room 2269 Beckman Institute	Li, F

545 **Systems Modeling & Simulation** credit: 4 hours.
Same as BADM 575. See BADM 575.

CRN	Type	Section	Time	Days	Location	Instructor
37926	lecture-discussion	A	10:30 AM - 12:20 PM	TR	room 138 Wohlers Hall	Engelbrecht-Wiggans, R

546 **Machine Learning in NLP** credit: 4 hours.

An introduction to the central learning frameworks and techniques that have emerged in the field of natural language processing and found applications in several areas in text and speech processing: from information retrieval and extraction, through speech recognition to syntax, semantics and language understanding related tasks. Presents the theoretical paradigms -- learning theoretic, probabilistic, and information theoretic -- and the relations among them, as well as the main algorithmic techniques developed within these and in key natural language applications. Prerequisite: CS 446 and CS 473.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

548 **Comp Models of Cognitive Proc** credit: 4 hours.

Formal models and concepts in vision and language; detailed analysis of computer vision, language, and learning problems; relevant psychological results and linguistic systems; and survey of the state-of-the-art in artificial intelligence. Same as ECE 548. Prerequisite: CS 440.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

549 **Seminar in Cognitive Science** credit: 2 or 4 hours.

Same as PSYC 514, ANTH 514, EPSY 551, LING 570, and PHIL 514. See PSYC 514.

CRN	Type	Section	Time	Days	Location	Instructor
48226	lecture-discussion	JH4	01:30 PM - 02:45 PM	MW	room 29 Psychology Building	Hummel, J
48226: Meets with Psyc 496 JH3 & JH4.						

550 **Iterative & Multigrid Solvrs** credit: 4 hours.

A comprehensive treatment of algebraic and multigrid iterative solvers for systems of equations, primarily linear equations arising from discretization of partial differential equations. Same as CSE 511. Prerequisite: CS 450 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

554 **Parallel Numerical Algorithms** credit: 4 hours.

Introduction to numerical algorithms for parallel computers: parallel algorithms in numerical linear algebra (dense and sparse solvers for linear systems and the algebraic eigenvalue problem), numerical handling of ordinary and partial differential equations, and numerical optimization techniques. Same as CSE 512. Prerequisite: One of CS 450, CS 455, CS 458, or CS 459; or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

558 **Topics in Numerical Analysis** credit: 4 hours.

Same as CSE 513. May be repeated. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

565 **Topics in Human-comp Interact** credit: 4 hours.

This course provides in-depth coverage of advanced topics in human-computer interaction (HCI). Topics include applied models of human performance and attention, design tools for creative design tasks, interruptions and peripheral displays, gestures and bimannual input, and usability evaluation techniques. The class meetings will consist of traditional classroom lectures along with group discussions. In the course, students will complete a research-oriented semester project of their choosing. Prerequisite: CS 465 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

570 **Mesh Generation** credit: 4 hours.

Design of geometric algorithms for grids and triangulations. Development of geometric and topological prerequisites (no prior course in these subjects is assumed). Topics include complexes, subdivisions, Delaunay triangulations,

randomized algorithms, homology groups, splines and surfaces. Same as CSE 514. Prerequisite: CS 473 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

571 **Combinatorial Mathematics** credit: 4 hours.

Same as MATH 580. See MATH 580.

CRN	Type	Section	Time	Days	Location	Instructor
33563	lecture-discussion	F1	02:00 PM - 02:50 PM	MWF	room 441 Altgeld Hall	West, D

572 **Extremal Graph Theory** credit: 4 hours.

Same as MATH 581. See MATH 581.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

573 **Topics in Algorithms** credit: 4 hours.

Theoretical analysis of various algorithms; topics include sorting, searching, selection, polynomial evaluation, matrix multiplication, and multiplication of real numbers. Same as CSE 515. May be repeated. Prerequisite: CS 473 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

575 **Methods of Combinatorics** credit: 4 hours.

Same as MATH 584. See MATH 584.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

576 **Topics in Automated Deduction** credit: 2 to 4 hours.

Advanced topics in computer-aided methods for formal deduction, selected from areas of current research, such as: resolution theorem proving strategies, special relations, equational reasoning, unification theory, rewrite systems, mathematical induction, program derivation, hybrid inference systems, and programming with logic. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

577 **Coding Theory** credit: 4 hours.
Same as ECE 556 and MATH 579. See ECE 556.

CRN	Type	Section	Time	Days	Location	Instructor
37138	discussion-recitation	L	08:30 AM - 09:50 AM	MW	room 163 Everitt Elec and Comp Engr Lab	Koetter, R
37138: 4 hours						

578 **Information Theory** credit: 4 hours.
Same as ECE 563 and STAT 563. See ECE 563.

CRN	Type	Section	Time	Days	Location	Instructor
37142	discussion-recitation	A	01:30 PM - 02:50 PM	MW	room 196 Lincoln Hall	Srikant, R
37142: 4 hours						

579 **Computational Complexity** credit: 4 hours.

Turing machines; determinism and non-determinism; time and space hierarchy theorems; speed-up and tape compression; Blum axioms; structure of complexity classes NP, P, NL, L, and PSPACE; complete problems; randomness and complexity classes RP, RL, and BPP; alternation, polynomial-time hierarchy; circuit complexity, parallel complexity, NC, and RNC; relativized computational complexity; time-space trade-offs. Same as ECE 579 and MATH 578. Prerequisite: CS 473 or CS 475 or consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
-----	------	---------	------	------	----------	------------

591 **Advanced Seminar in CS** credit: 0 to 4 hours.

Seminar on topics of current interest. Subjects will be announced in the Schedule. Approved for both letter and S/U grading. May be repeated in the same or subsequent terms as topics vary. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
35941	lecture-discussion	ACT	ARRANGED		room ARR Siebel Center for Comp Sci	Padua, D; Marinov, D; Harrison, W

35941: 1 hoursTopic: Advanced Compiler Technology. Prerequisite: CS 426.						
43832	lecture-discussion	BIO	ARRANGED		room ARR Siebel Center for Comp Sci	Liu, L; Han, J; Schatz, B; Zhai, C; Sinha, S; Zhong, S
43832: 1 hoursTopic: Advanced Seminar on Biomedical Informatics.						
35974	lecture-discussion	BPB	ARRANGED		room ARR Siebel Center for Comp Sci	Bailey, B
35974: 1 hoursTopic: Seminar in Human-Computer Interaction. Prerequisite: None.						
41196	lecture-discussion	CXZ	ARRANGED		room ARR Siebel Center for Comp Sci	Zhai, C
41196: 1 hoursTopic: Advanced Topics in Information Retrieval.						
35937	lecture-discussion	DCS	04:00 PM - 04:50 PM	M	room 1404 Siebel Center for Comp Sci	Hou, J
35937: 1 hoursTopic: Department of CS Research Seminar.						
41197	lecture-discussion	EA	ARRANGED		room ARR Siebel Center for Comp Sci	Amir, E
41197: 1 hoursTopic: Broad-Area Seminar: AI-Learning-Vision-Robotics-HCI						
35953	lecture-discussion	HAN	ARRANGED		room ARR Siebel Center for Comp Sci	Han, J
35953: 1 hoursTopic: Data Mining for Advanced Applications. Prerequisite: Credit or concurrent registration in CS 412 or equivalent.						
43828	lecture-discussion	IG	ARRANGED		room ARR Siebel Center for Comp Sci	Gupta, I
43828: 1 hoursTopic: Advanced Seminar in Distributed Systems. Prerequisite: CS 598IG or CS 425 or any basic course on distributed systems.						
35949	lecture-discussion	JE	ARRANGED		room ARR Siebel Center for Comp Sci	Erickson, J
35949: 1 hoursTopic: Advanced Topics in Analysis of Algorithms. Prerequisite: Any graduate-level algorithms course or instructor's consent.						
35964	lecture-discussion	JM	ARRANGED		room ARR Siebel Center for Comp Sci	Meseguer, J

35964: 1 hoursTopic: Maude: Theory and Applications. Prerequisite: Credit or concurrent registration in CS 476, or consent of instructor.						
43831	lecture-discussion	KGK	ARRANGED		room ARR Siebel Center for Comp Sci	Karahalios, K
43831: 1 hoursTopic: Social Computing.						
43833	lecture-discussion	KN	ARRANGED		room ARR Siebel Center for Comp Sci	Nahrstedt, K
43833: 1 hoursTopic: "Tele-Immersive Systems". Prerequisite: Any of CS 423, 438, 425 or 414.						
35957	lecture-discussion	MH	ARRANGED		room ARR Siebel Center for Comp Sci	Heath, M
35957: 1 hoursTopic: Scientific and Parallel Computing. Prerequisite: Consent of instructor.						
41193	lecture-discussion	MSW	ARRANGED		room ARR Siebel Center for Comp Sci	Chang, K
41193: 1 hoursTopic: Database and Information Systems Seminar. Prerequisite: Consent of Instructor.						
41977	lecture	PHD	05:00 PM - 05:50 PM	W	room 1404 Siebel Center for Comp Sci	Lavalle, S; Belford, G
41977: 1 hoursTopic: Orientation for new PhD students.						
35958	lecture-discussion	REJ	ARRANGED		room ARR Siebel Center for Comp Sci	Johnson, R
35958: 1 hoursTopic: Software Architecture Seminar. Prerequisite: Consent of instructor.						
41614	lecture-discussion	RHC	ARRANGED		room ARR Siebel Center for Comp Sci	Campbell, R
41614: 1 hoursTopic: Security Reading Seminar. Prerequisite: A prior course in security or CS423 or consent of instructor.						
46060	lecture-discussion	SN	01:30 PM - 02:50 PM	F	room 1103 Siebel Center for Comp Sci	Vaidya, N; Kravets, R; Gupta, I; Luo, H
46060: 1 hoursTopic: New Systems and Networking Seminar. Credit: 1 Hour.						
35965	lecture-discussion	SRR	04:00 PM - 04:50 PM	R		Ray, S

35965: Topic: Artificial Neural Networks and Computational Brain Theory. Prerequisite: Background in CS, AI and interest in neuroscience topics. Credit: 1 or 2 hours. (Two hour credit entails leading the discussion one time.)

36448	lecture-discussion	YZY	ARRANGED		room ARR Siebel Center for Comp Sci	Yu, Y
-------	--------------------	-----	----------	--	---	-------

36448: 1 hours Topic: Research Topics in Computer Graphics. Prerequisite: Consent of instructor.

597 **Individual Study** credit: 2 to 16 hours.

Individual study or reading in a subject not covered in normal course offerings. May be repeated. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10467	independent study		ARRANGED			
10467: Instructor Approval Required						
10467: Students must see the CS Department to receive the appropriate CRN for the instructor.						

598 **Special Topics in CS** credit: 2 to 4 hours.

Lecture course in topics of current interest. See Schedule for current topics. May be repeated. Prerequisite: As specified for each topic offering, see Schedule or departmental course description.

CRN	Type	Section	Time	Days	Location	Instructor
43665	lecture-discussion	ANH	09:30 AM - 10:45 AM	TR	room 1111 Siebel Center for Comp Sci	Hirani, A
43665: 4 hours Topic: Symplectic Integrators and Discrete Mechanics Symplectic integrators are widely used in science and engineering for numerically integrating Hamiltonian differential equations. While they have been around for decades, a relatively recent technique for deriving symplectic integrators is based on a variational approach. In this approach the variational principle, rather than the differential equations are discretized. This technique generates not just symplectic integrators but a larger class that is sometimes called variational integrators. The techniques for creating and studying such methods are firmly grounded in a geometric, variational approach to mechanics (both Lagrangian and Hamiltonian). We will carefully study a few recent papers in discrete mechanics and variational integrators. We will start with ordinary differential equations and if time permits, we will venture into multisymplectic variational integrators. Graduate students in numerical analysis, mathematics, engineering, physics and computational science may find this class useful. This will be a discussion type class. Participation in the discussions will be the major component of the grade.						
42377	lecture-discussion	CAG	11:00 AM - 12:15 PM	TR	room 1131 Siebel Center for Comp Sci	Gunter, C

42377: 4 hoursTopic: Advanced Computer Security. Prerequisite: a 400 level course in security or consent of instructor. Research projects in security in the areas of monitoring and surveillance, critical infrastructure protection, unwanted traffic on the Internet, secure web services, tamper-resistant security architectures.						
46950	lecture-discussion	CC	11:00 AM - 12:15 PM	TR	room 1302 Siebel Center for Comp Sci	Chekuri, C
46950: 4 hoursTopic: Approximation Algorithms. Approximation algorithms are heuristics for hard problems that have provably good guarantees on the quality of their solutions. This course will provide a broad introduction to results and techniques in this area.						
46981	lecture-discussion	CW	01:00 PM - 03:50 PM	T	room ARR Siebel Center for Comp Sci	Twidale, M
46981: 4 hoursTopic: Computer Supported Cooperative Work. PhD seminar; other graduate students may enroll with consent of instructor. (twidale@uiuc.edu)						
46983	lecture-discussion	DAF	03:30 PM - 04:45 PM	TR	room ARR Siebel Center for Comp Sci	Forsyth, D
46983: 4 hoursTopics in Statistical Learning This graduate seminar will read and discuss papers dealing with major techniques and ideas in statistical learning. Grading by participation and class project.						
42393	lecture-discussion	HL	09:30 AM - 10:45 AM	WF	room 1111 Siebel Center for Comp Sci	Luo, H
42393: 4 hoursTopic: Advanced Topics on Wireless Networks. Prerequisite: CS 438 or equivalent. Topics: wireless communication basics, access technologies, medium access control, naming and addressing, routing and forwarding, wireless transport, mobility support and management, security, and power management. We will examine and discuss challenges and solutions to these problems in the contexts of 2/3G cellular networks, wireless LANs, ad-hoc networks, and mesh networks.						
42378	lecture-discussion	KGK	11:00 AM - 12:15 PM	WF	room 1111 Siebel Center for Comp Sci	Karahalios, K
42378: 4 hoursTopic: Social Spaces.						
35992	lecture-discussion	MC	11:00 AM - 12:15 PM	TR	room 1111 Siebel Center for Comp Sci	Caccamo, M
35992: 4 hoursTopic: Advanced Topics in Real-Time Embedded Systems. Prerequisite: CS 424 (Real-Time Systems), or CS 431 (Embedded System Architecture), or consent of the instructor. In this course, we will discuss topics about the design and theoretical analysis of distributed real-time embedded systems. The goal of this course is to provide a deep understanding about resource management in modern networked embedded systems composed of diverse activities with different degrees of criticality and with different forms of timing requirements. This course is structured to improve students' research skill and their ability of critical thinking. Specifically, the course will include the following topics: (T1) design of predictable and efficient soft real-time systems; (T2) real-time resource management for multi-processor platforms; (T3) principles of real-time wireless networking.						

40108	lecture-discussion	SOS	10:00 AM - 12:50 PM	F	room 11 Smith Memorial Hall	Gasser, L
40108: 4 hours Topics in Self-Organizing Information Systems. Doctoral seminar; other graduate students may enroll with permission of instructor (gasser@uiuc.edu). Meets with LIS590 (SOS).						

599 **Thesis Research** credit: 0 to 16 hours.
 May be repeated. Approved for S/U grading only. Prerequisite: Consent of instructor.

CRN	Type	Section	Time	Days	Location	Instructor
10469	independent study		ARRANGED			
10469: Instructor Approval Required						
10469: Students must see the CS Department to receive the appropriate CRN for the instructor.						