COMPUTER INFORMATION SYSTEMS

This program investigates the analysis, design, development, implementation, evaluation and effective use of computer information systems in organizations. Since business and government are principal users of computers, Computer Information Systems majors will select cognates from the School of Management. Students are encouraged to participate in an internship.

	Dept. and No.	Descriptive Title of Course	Credits FALL	Credits SPRING
		FIRST YEAR		
MAJOR	CMPS 134-144	Computer Science I-II	3	4
COGNATE	MATH 114	Analysis I		4
GE C/IL	C/IL 102	Computer Info. Literacy	3	
GE WRTG-SPCH	WRTG107-COMM 100	Written & Oral Comm.	3	3
GE PHIL	PHIL 120	Intro. to Philosophy	3	
GE T/RS	T/RS 121	Theology I		3
GE HUMN	HUMN ELECT	Humanities Elective		3
GE QUAN	MATH 142	Discrete Structures	4	
GE FSEM	INTD 100	Freshman Seminar	1	
GE PHED	PHED ELECT	Physical Education		1
			17	18
		SECOND YEAR		
MAJOR	CMPS 240-250	Data Structures-Machine Org.	3	3
COGNATE	ACC 253-254	Financial & Managerial Acc.	3	3
GE PHIL	PHIL 210	Ethics	3	
GE T/RS	T/RS 122	Theology II		3
GE HUMN	HUMN ELECT	Humanities Elective	3	
GE S/BH	ECO 153-154	Prin. of Micro.-Macro. Eco	3	3
GE ELECT	MATH 204 [1]	Statistics		3
GE PHED	PHED ELECT	Physical Education	1	1
			16	16
		THIRD YEAR		
MAJOR	CMPS 352-ELECT [2]	Operating Systems-Elective	3	3
MAJOR	CMPS 340-341	File Processing-Database Systems	4	3
MAJOR	CMPS 330-331	Info. Sys.-Sys. Analysis & Design	3	3
COGNATE	MGT 351-352	Intro. Management I & II	3	3
COGNATE	MGT 251	Legal Environment of Business	3	
GE NSCI	NSCI ELECT	Natural Science Elective	3	
GE ELECT	WRTG 211	Technical Writing		3
			19	15
		FOURTH YEAR		
MAJOR	CMPS 490-ELECT [2]	Computer Projects-Elective	3	6
COGNATE	MKT 351	Intro. Marketing	3	
GE HUMN	HUMN ELECT	Humanities Electives	3	3
GE NSCI	NSCI ELECT	Natural Science Elective	3	
GE PHIL	PHIL 214	Computers and Ethics		3
GE ELECT	ELECT	Free Electives	3	3
			15	15

TOTAL: 131 credits

[1] or STAT 251

[2] Elective courses in the Computer Information Systems major must be CMPS courses numbered 200 or higher.

MINOR. The minor in Computer Information Systems must include CMPS 134, 144, 330, and 331, and any two of 240, 340, 341, or C/IL 102.

CMPS 108
COBOL Programming 3 credits
(Prerequisite: Previous use of a computer) An introduction to ANSI standard COBOL. Traditional business applications will be emphasized. Topics include internal data representation, data editing, calculations, one-level tables, search, sort,and reporting.

CMPS 134
Computer Science I 3 credits
An introduction to programming concepts and methodology using the programming language Pascal. The course emphasizes a structured programming approach. Topics included are problem analysis, modularization, top-down design and the elements of the programming language Pascal.

CMPS 144
Computer Science II 4 credits
(Prerequisite: CMPS 134 and MATH 142) A sequel to CMPS 134, continuing the study of software development using a modern object-oriented programming language. The course deals with the role of analysis and design in the construction of quality software, emphasizing logical modularization, abstraction, coupling, cohesion, and program correctness. The course also presents the object-oriented concepts of polymorphism and dynamic dispatch and discusses such software engineering concepts as encapsulation, information hiding, and software reuse.

CMPS 202 Staff
Web Development 3 credit
(Prerequisites: one of CMPS 102, 104 or C/IL 102 or equivalent) A course for non-computer science majors that will cover fundamental aspects of the development of personal, professional and business resources using web development tools. Topics include – creating web pages using basic HTML; advanced HTML concepts; frames; JavaScript to enhance web pages; forms; CGI (common gateway interface); Java classes. Emphasis will be placed on client side development although server side issues will also be covered. May not be used by computer science or computer information systems students as part of the major. This is a technical course for students who do not necessarily have a technical background.

CMPS 240
Data Structures 3 credits
(Prerequisite: CMPS 144) An examination of the issues of representation and encapsulation, as they pertain to abstract data types. Measurement of the efficiency of representations and the algorithms that employ them. A modern object-oriented programming language is used.

CMPS 250
Machine Organization and 3 credits
Assembly Language Programming
(Prerequisite: CMPS 144) An introduction to machine organization and architecture. Among the topics discussed will be machine organization, assembler programming, the representation of data, the assembler, input-output routines and the use of macros.

CMPS 260
Theoretical Foundations 3 credits
of Computer Science
(Prerequisite: CMPS 240) An examination of the fundamental models and concepts of computation — automata, formal languages, and grammars — and how they are related. Church-Turing thesis; recursive and recursively renumerable sets; unsolvable problems; complexity of algorithms; Chomsky hierarchy.

CMPS 330
Information Systems 3 credits
(Prerequisite: CMPS 102/104, C/IL 102, or CMPS 134) Introduction to concepts and practices of information processing. Computerized system requirements and techniques in providing appropriate decision-making information to management.

CMPS 331
Systems Analysis and Design 3 credits
(Prerequisite: CMPS 330) A study of the system development methodology and the role played by the systems analyst in developing user-accepted information systems.

CMPS 340
File Processing 4 credits
(Prerequisite: CMPS 144 required, CMPS 240 recommended.) File structures concepts and file processing applications using COBOL as a programming language. Topics include file maintenance and storage management; file searching, sorting, and merging; cosequential processing; index structures; B-trees; hash tables; indexed sequential files; database concepts.

CMPS 341
Database Systems 3 credits
(Prerequisite: CMPS 340 required, CMPS 240 recommended) An introduction to database management systems, DBMS, with an emphasis on relational database design and applications. The primary software used is ORACLE DBMS.

CMPS 344
Programming Languages 3 credits
(Prerequisite: CMPS 352) A study of programming languages from both the theoretical and practical perspectives. The evolution of languages is reviewed in order to know the design considerations of the past and recognize those of the present. A survey of major and developing paradigms and languages is undertaken which includes use of specific languages to broaden the student's experience. Implementation is studied through an introduction to compiling and interpretation.

CMPS 350
Computer Architecture 3 credits
(Prerequisite: CMPS 250) A study of the logical structure of computer system organization including a survey of logic and design with an emphasis on functional components. Topics include instruction sets, hard-wired and micro-programmed control unit designs, memory systems (caches and virtual memory), I/O systems (interrupts, DMA, and channels). Overview and examples of alternative and advanced computer architectures (pipeline, array processors, multiprocessors).

CMPS 352
Operating Systems 3 credits
(Prerequisite: CMPS 240 and CMPS 250) The analysis and design of computer systems, including operating system design, memory management, scheduling, and the implementation of multiprogramming.

CMPS 354
Data Communications and Networks 3 credits
(Prerequisite: CMPS 352) A study of data communication and networking concepts, including distributed system architectures, electronic interfaces, data transmission, data link protocols, terminal networks, computer communication, public data networks, and local area networks.

CMPS 360
Analysis of Algorithms 3 credits
(Prerequisite: CMPS 240) A survey of methods for designing and analyzing algorithms. Classic algorithms from graph theory, combinatorics and text processing are examined, as are traditional design strategies such as divide-and-conquer, backtracking and dynamic programming. Other topics include NP-completeness and parallel algorithms.

CMPS 362
Numerical Analysis 3 credits
(Prerequisite: CMPS 134 and MATH 222) A survey of numerical methods for solving equations, integration, differentiation, interpolation, differential equations, and linear algebra, and the analysis of error.

CMPS 364
Theory of Computation 3 credits
(Prerequisite: CMPS 260) The development of a theoretical notion of computability and its relationship to Turing computability and recursive functions; the study of the relationships between automata, formal languages and grammars.

CMPS 370
Computer Graphics 3 credits
(Prerequisite: CMPS 240) An introduction to the hardware, software and techniques used to generate graphical representations by computer. Two and three dimensional concepts and algorithms are studied with corresponding use of popular standard packages (GKS, PHIGS, etc.) to generate images. Advanced topics such as animation and the various aspects of realistic rendering are introduced.

CMPS 372
Artificial Intelligence 3 credits
(Prerequisite: CMPS 240) Problem solving using expert systems, heuristic programming techniques, tree speed-up techniques, and learning mechanisms.

CMPS 374
Fundamentals of Software Engineering 3 credits
(Prerequisite: CMPS 240) An introduction to the concepts of Software Engineering. Stress is placed upon formal models for the design and development of high-quality software. Topics include: project planning, requirements analysis, system design, program design, program implementation, program testing, system testing, system delivery,and maintenance. A group project will be included.

CMPS 384
Special Topics 3 credits each
(Departmental permission required) Topics and prerequisites will be announced prior to preregistration.

CMPS 393
Computer Research 3 credits
(Departmental permission required) A research project carried out by a student under the direction of a faculty member in the department. The results will be prepared in a form suitable for publication. Reader fee.

CMPS 440
Compiler Design 3 credits
(Prerequisite: CMPS 344) Study of techniques and problems involved in constructing compilers. Lexical analysis, syntax analysis, semantic analysis, symbol table management, code generation, code optimization.

CMPS 481
Computer Internship 3 credits
(Departmental permission required) An intensive job experience in computing which carries academic credit. Prior approval is required and an information booklet is available from the department. Reader fee.

CMPS 490
(W)Computer Projects 3 credits
(Departmental permission required) In this course students prepare and present individual computer projects to be evaluated by the instructor and their fellow students. Seniors only.