Computer and Information Science

Faculty and Fields of Interest

Aboelela, Emad H Assistant Professor of Electrical and Computer and Information Science (2001), BS 1990, MS 1993, PhD 1998 University of Miami. *Specializations:* Computer networks, fuzzy systems.

Balasubramanian, Ramprasad Assistant Professor of Computer and Information Science (2000), BSc 1989 University of Madras, India, MS 1991 University of Toledo, MSOperRes 1993 University of Kentucky, PhD 1999 University of South Florida. *Specializations:* Computer vision, image processing, pattern recognition, artificial intelligence.

Bergandy, Jan (Graduate Program Director) Professor of Computer and Information Science (1983), MS 1976 Technical University of Poznan, MS 1976 Adam Mickiewicz University, PhD 1980 Technical University of Poznan. *Specializations:* Object technology, distributed systems, software engineering.

Bergstein, Paul L Professor of Computer and Information Science (1998), BS 1978 SUNY College of Environmental Science and Syracuse University, MS 1981 Massachusetts Institute of Technology, PhD 1994 Northeastern University. *Specializations:* Object-oriented progamming, databases.

Eberbach, Eugene Associate Professor of Computer and Information Science (2001), MS 1977, PhD 1982 Technical University of Warsaw. *Specializations:* Concurrent computations, artificial intelligence, evolutionary computations.

Green, Robert (Interim Vice Chancellor for Library Services, Information Resources, and Technology) Professor of Computer and Information Science and Electrical and Computer Engineering (1982), BS 1968, MS 1971, PhD 1972 University of Michigan. *Specializations:* Software engineering, parallel computer architectures, algorithms, neural networks.

Mikolajczak, Boleslaw (Chairperson, Department of Computer and Information Science) Professor of Computer and Information Science (1987), MS 1970 Technical University Poznan, MS 1972 Adam Mickiewicz University, PhD 1974, Dr Habil 1979 Technical University of Poznan. *Specializations:* Parallel and distributed computations, computer architecture, foundations of computer science, algorithms and complexity.

Shen, Li Assistant Professor of Computer and Information Science (2004), BS 1993 Xi'an Jiao Tong University, MS 1996 Shanghai Jiao Tong University, PhD 2004 Dartmouth College. *Specializations:* Computer vision, pattern analysis, medical imaging, bioinformatics, and geometric modeling.

Upchurch, Richard Professor of Computer and Information Science (1983), BS 1969, MS 1978 New Mexico Institute of Mining and Technology. *Specializations:* Social implications, software engineering, human-computer interaction.

Valova, Iren T Associate Professor of Computer Information Science (2000), MSc 1991 Technical University, Sofia, Bulgaria, PhD 1997 Tokyo Institute of Technology. *Specializations:* Artificial intelligence, neural networks, pattern recognition.

Vokkarane, Vinod Assistant Professor of Computer and Information Science (2004), BEng 1999 University of Mysore, MS 2001, PhD 2004 University of Texas at Dallas. *Specializations:* Computer networks, high performance networks, wireless and optical networks.

Xie, Gaoyan Assistant Professor of Computer and Information Science (2003), BS 1989, MS 1992 Zhejiang University, MS 1998 Wright State University, PhD 2003 University of Illinois Chicago. *Specializations:* Component-based software development and engineering, software verification and validation, model checking and software checking.

Xu, Haiping Assistant Professor of Computer and Information Science (2005), BS 1996, MS 1999 Nanjing University, PhD 2005 Washington State University. *Specializations:* Software engineering, distributed computing, multi-agent systems, formal methods.

Zhang, Xiaoqin Assistant Professor of Computer and Information Science (2002), BS 1995 University of Science and Technology of China, MS 1998 University of Massachusetts Amherst. *Specializations:* Multi-agent systems, intelligent agents, e-commerce.

Graduate Computer Science at UMass Dartmouth

Department of Computer and Information Sciences College of Engineering

The Computer Science Master's program gives graduates a broad and deep knowledge of computer science by offering a strong core program with a wide selection of elective courses. The program maintains a balance between theory, systems, and applications, with emphasis on software development.

Our students gain the ability and courage to use their knowledge by working on realistic scale projects in the graduate courses. Their experience includes work as a member of a team as well as situations where an individual is responsible for the whole project from problem specification to the completion of the solution. Students learn to conduct independent research and present their results in oral and written forms. They graduate with the knowledge and skills required to develop and design high quality computer systems and application software. They have the ability to follow the rapid changes in the field of Computer Science. As highly qualified professionals, our students are ready to compete for responsible positions in the computer industry, research institutions, government, or to pursue their education in PhD programs.

The Computer and Information Science Department maintains laboratories for upper-division undergraduate courses and graduate activities, consisting of SUNStations with multiprocessor server, and Power PC, and Windows NT workstations, each grouped in a local area network and also cross-networked, with software allowing multiprocessor functions for parallel and distributed computing and networking computing; and a laboratory with computers dedicated to WWW operations and development. There are also individual machines of various kinds, including a transputer-based parallel system.

The backbone of institutional computing at UMass Dartmouth is the ALPHA system, two Alpha 2100s (model 4/275) for administrative and research data processing and an Alpha 2000 (model 4/200) for library research and instructional use. The ALPHA system has approximately 120 general access terminals connected to a Metapath communications network across campus. The ALPHA has a variety of software available including electronic mail, bulletin boards, programming languages such as BASIC, FORTRAN, Pascal, C, Cobol, and various statistical packages. The ALPHA computers provide 64 gigabytes of disk storage and operate on an FDDI network. Various processing and data functions are also resident on the VAX 8650, which was until 1995 the university's mainframe computer.

Admission Requirements

Applicants must submit the required application materials to the Graduate Office. In addition, they must submit GRE general scores. The personal statement should explain the candidate's goals and objectives concerning his/her professional career.

Applicants should have a bachelor's degree from an accredited institution (Applicants who do not meet this criterion may also be considered for admission if they can demonstrate convincingly that they have the equivalent of a baccalaureate degree.) In addition, they should demonstrate:

- Knowledge of program design in a high-level programming language (such as C, C++, Java)
- knowledge of an assembly language, computer architecture, and operating systems
- Knowledge of software engineering
- Knowledge of mathematical analysis and elements of theoretical foundations of computer science and analysis of algorithms

The department has established a fast-track BS-MS program permitting UMass Dartmouth Computer Science undergraduates to progress to the masters level smoothly and at a savings of some overall credits. See the *General Catalogue* for information and special admissions procedures.

Financial Assistance

A number of assistantships are available on a competitive basis. Other assistance, such as loans or work study, may be available to you. Please consult the chapter on "Expenses and Financial Assistance."

Contact

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Degree Requirements (MS degree)

An individual graduate program is arranged by the student with an advisor during the first semester and approved by the student's Graduate Committee. All students complete three required computer science courses and a master's project course. Elective courses round out the student's program.

		Credits
Complete three core courses:		
CIS 560	Theoretical Computer Sci.	3
CIS 570	Adv. Computer Systems	3
CIS 580	Paradigmatic Software Dev.	3
Complete required project course:		
CIS 600	Master's Project	3
Select six additional CIS 500- or 600-level courses		18

Approved courses from another department may be substituted. Students approved to do a formal thesis register for CIS 690 Master's Thesis (3) as one of these elective courses.

Total program credits *30*

Additional requirements:

- As many as two undergraduate CIS technical electives may serve as graduate electives, only with previous approval of the Graduate Curriculum Committee.
- No more than 9 credits of coursework taken as a non-degree special student may subsequently be credited toward the graduate degree.
- A written comprehensive Master's Degree examination based on the three foundation courses. Examination questions will be based on a list of topics and reading lists provided by the Department. This examination will be administered twice a year, once in the middle of May and once in the second part of December.
- Students must meet the university graduate requirement of at least a 3.0 grade point average; only courses graded C or better may count toward the degree.
- Students doing a Master's Thesis will make an oral presentation on the thesis topic.

Graduate Post-Baccalaureate Certificates

A certificate offers the working professional recognition of a coherent program of advanced study at the graduate level. Each of our certificate programs is compatible with our MS degree requirements, enabling certificate recipients to transition to a degree program without loss of credits.

Acceptance to a Certificate Program
Applicants must have an earned MS in an appropriate field. One applies for acceptance to a graduate certificate program through the Graduate Studies Office. Applicants follow the procedures for graduate degree acceptance into the MS in Computer Science, but in a curtailed form. Thus, they submit a shortened application form and supply an essay and official transcripts of all post-secondary work, as instructed herein. However, they are not required to submit GRE scores or recommendation letters.

A joint faculty committee will review applications for acceptance to this certificate program. One element in the review will be to assess whether a student has met the stated prerequisites and in general has the appropriate combination of background and experience to succeed in the program. It is possible for acceptance to be offered with a contingency that the student must also take one or more undergraduate prerequisite courses.

Other Certificate Policies
Prospective students can take up to two courses (with permission of the instructor) for the certificate before completing their official acceptance to the certificate program. Certificate students may use no more than one CIS Technical Elective 400-level course toward their certificate program, and a 400-level course may be used only when the related graduate course is not offered during the student's certificate program enrollment. Other graduate policies, such as those for longevity of credit, acceptable grades, and repeatability of courses, apply to certificate students as to degree students.

See next page for description and requirements of three certificate programs.

Requirements, Post-Baccalaureate Certificates

Computer Science

Upon completion of this certificate program, participants will have gained:

- Knowledge of advanced computer systems and software development.
- Advanced knowledge of selected areas of modern computing including but not limited to intelligent information systems, parallel and distributed computing systems, and software engineering.
- Understanding of new advances in the discpline of computing such as neural and evolutionary computing, image processing and computer graphics.
- Understanding of fundamental issues associated with compilers, operating systems, security, and computer systems performance evaluation
- A route into the MS programs in Computer Science at UMass Dartmouth.

Complete the following courses:

CIS 570 Advanced Computer Systems 3
CIS 580 Paradigmatic Software Dev. 3

Choose three of the following: 9
CIS 525 Softw. Dev. of Parallel & Distrib. Systs.
CIS 531 Software System Specification
CIS 532 Software System Design
CIS 545 Programming Languages
CIS 552 Database Design
CIS 554 Advanced Computer Graphics
CIS 561 Artificial Intelligence
CIS 571 Compiler Construction
CIS 572 Real-time Systems
CIS 573 Operating Systems
CIS 574 Advanced Computer Architecture
CIS 575 Parallel Algorithms and Parallel Arch.
CIS 577 Computer Networks
CIS 578 Eval. of Computer Systems Perf.
CIS 581 Design & Verification of Info. Systs.
CIS 585 Image Processing &Computer Vision
CIS 588 Neural Computing
CIS 602 Special Topics in Computer Science

Total credits for certificate *15*

The five courses that students take for this certificate are compatible with MS degree requirements for Computer Science, enabling certificate recipients to transition to degree program without loss of credit.

Computer Networks and Distributed Systems

Upon completion of this certificate program, participants will have gained:

- Knowledge of tools, techniques, and theory associated with computer networks and their performance evaluation.
- Solid understanding of distributed computing systems including distributed operating systems.
- Understanding of fundamental issues associated with computer networks engineering including multimedia networking.
- A route into the MS programs in Computer Science at UMass Dartmouth.

Certificate Courses:

CIS 570 Advanced Computer Systems
CIS 573 Operating Systems
CIS 577 Computer Networks
CIS 578 Evaluation of Computer Systems Performance
CIS 579 Multimedia Networking

Total credits for certificate *15*

The five courses that students take for this certificate are compatible with MS degree requirements for Computer Science, enabling certificate recipients to transition to the degree program without loss of credit.

Software Development and Software Engineering

Upon completion of this certificate program, participants will have gained:

- Knowledge of tools, techniques, and theory associated with software development.
- Understanding and breadth of knowledge of software engineering.
- Understanding of fundamental issues associated with software engineering of parallel and distributed software systems.
- A route into the MS programs in either Computer Engineering or in Computer Science at UMass Dartmouth.

Certificate Courses:

CIS 525 Software Development of Parallel and Distributed Systems
CIS 531 Software System Specification
CIS 532 Software System Design
CIS 552 Database Systems
CIS 580 Paradigmatic Software Development

Total credits for certificate *15*

The five courses that students take for this certificate are compatible with MS degree requirements for Computer Science, enabling certificate recipients to transition to degree program without loss of credit.

BS/MS Undergraduate/Graduate Integrated Program Option

The department offers an integrated program that allows qualified UMass Dartmouth undergraduate majors in Computer Science to proceed directly to the master's degree program and complete both degrees with a reduction in overall credits required. See the current *General Catalogue* for information on this option.

Computer Science Courses

CIS 521 three credits
Computability Theory
Prerequisite: CIS 361 or equivalent, or permission of instructor
Computability of sets and functions in terms of various computation models, Church-Turing thesis. Systems of recursion equations and Post canonical systems are studied. Properties of the classes of recursive functions, recursive sets, and recursively enumerable sets are also covered.

CIS 522 three credits
Algorithms and Complexity
Prerequisite: CIS 360 or equivalent, or permission of instructor
Evaluation of algorithms concerning their time and space complexity. Complexity hier-archies, axiomatic approach to computational complexity, NP complete problems, approximation algorithms for these problems.

CIS 525 three credits
Parallel and Distributed Software Development
Prerequisite: CIS 361 or equivalent, or permission of instructor
Design and development of parallel and distributed systems. This course provides state-of-the art presentation of software development for parallel and distributed systems. A systematic model-based approach has been applied across stages of software development. Various versions of Petri nets are used to model , specify, validate, and verify correctness of parallel and distributed systems. Performance is also assessed based on stochastic Petri nets. Rapid prototyping of parallel and distributed systems with automatic code generation is an ultimate goal of his course. Comparison with other approaches is also provided.

CIS 526 three credits
Functional Programming and Type Theory
Prerequisite: CIS 360 or equivalent, or permission of instructor
Introduction to logic, type theory, and the lambda calculus. The course examines LISP as a first application of these ideas, consistency proofs using cut elimination and type theory, and constructive type of theory in functional programming languages in attempts to achieve program verification and automatic code generation.

CIS 531 three credits
Software System Specification
Prerequisite: CIS 480 or equivalent
Formal foundation of the theory and practice of software specification; production of correct, consistent, and reliable software systems by expressing the requirements of the system in formal ways. Formal and informal requirements analysis and specification techniques, the relation of analysis and specification to concerns of validation and verification, maintenance, and reusability.

CIS 532 three credits
Software Systems Design
Prerequisite: CIS 480 or equivalent
Principles and techniques for obtaining an architectural design from a system specification. Where appropriate, automated software design tools are used to demonstrate particular methodology. The relation of various design methods to the production of quality software that meets its specification, and the relation of design method to other life-cycle aspects. Design methods, design tools, the design process, and particular application domains for design techniques.

CIS 543 three credits
Software Systems Design with ADA
Prerequisite: CIS 443 or equivalent, or permission of instructor
Software engineering principles and methodologies. Also considered are issues related to the life cycle of large systems developed in ADA, software engineering of real-time, fault-tolerant and distributed systems, and software reuse.

CIS 545 three credits
Programming Languages
Prerequisite: Permission of instructor
Techniques of formal definition of programming languages, semantics of programming languages, programming styles, and language effects on software production. Introduces current trends in programming such as language features of problem-oriented and object-oriented programming, and analysis and design of user-oriented application languages.

CIS 552 three credits
Database Design
Prerequisite: CIS 452 or equivalent, or permission of instructor
The relational, hierarchical, and network approaches to database systems, including relational algebra and calculus, data dependencies, normal forms, data semantics, query optimization, and concurrency control on distributed database systems.

CIS 554 three credits
Advanced Computer Graphics
Prerequisite: CIS 454 or equivalent, or permission of instructor
Three-dimensional graphics including: color, shading, shadowing and texture, hidden surface algorithms. An extensive project will be assigned, including documentation and presentation.

CIS 560 three credits
Theoretical Computer Science
Prerequisites: CIS 360, 361, or equivalents
Theoretical basis of the development of computer science. The course details particular formalisms used in the design of hardware and software systems. Intrinsic limitations of computation are described. Advanced topics of automata theory and analysis of algorithms are included. The course also covers Turing machines, the halting problem, models of computation, intractable computations, polynomial reductions, P vs. NP, parallel algorithms, various formal descriptions and specifications of programs and computations, and proofs of program correctness and interactive proof systems.

CIS 561 three credits
Artificial Intelligence
Expert system architectures: forward-production, logic programming, deductive retrieval, and semantic network systems. The course also treats natural language systems, illustrative working systems, and AI programming.

CIS 563 three credits
MultiAgent Systems
Introduction to multiagent systems and distributed artificial intelligence. The course examines the issues that arise when groups or societies of autonomous agents interact to solve interrelated problems. Topics include defining multiagent systems and their characteristics, reasoning about agents' knowledge and beliefs, distributed problem solving and planning, coordination and negotiation, the organization and control of complex, distributed multiagent systems, learning in multiagent systems, and applications in the following domains: internet information gathering, electronic commerce, virtual markets, workflow management, distributed sensing network, distributed planning and resource allocation.

CIS 564 three credits
Mobile Robotics
Prerequisite: Graduate standing
The theory, software and hardware for autonomous mobile robots. Reactive behavior-based, deliberative goal-based, and utility-based robotic architectures will be presented. Control and planning under bounded resources will be covered. Interaction with environment using sensors and actuators, robot kinematics and dynamics, reinforcement and evolutionary learning techniques for intelligent robots, interaction of competing and cooperating

multi-robot systems will be presented. Various applications of mobile robots will be explored.

CIS 565 three credits
Evolutionary Computation
Prerequisite: Graduate standing
Presentation of evolutionary algorithms and comparison to traditional solving techniques. This course deals with a powerful new technique for solution of hard, intractable real-world problems, based on principles of natural evolution. Four main areas of evolutionary computation will be explored: genetic algorithms, genetic programming, evolution strategies, and evolutionary programming. Applications of evolutionary computation to related areas of computer science will be discussed.

CIS 566 three credits
Theory of Linear and Integer Programming and Computer Applications
Prerequisite: CIS 360 or equivalent, or permission of instructor
Basics of the simplex algorithm, tableaux, artificial variables, the two-phase method, the dual problem and its economic interpretation, primal-dual relationships and method. Also studied are applications to transportation problems and network flows, the polynomial methods of Khachiyan and Karmarkar, and integer programming. Computer methods and exercises will be employed throughout.

CIS 570 three credits
Advanced Computer Systems
Prerequisite: CIS 314 or equivalent
In depth treatment of current computer systems, with performance issues at the center of an analytical approach. The course explores operating system software and the interrelation between architecture and system software. Advanced topics of compiling, assembly, linking and loading of high-level language software are included. The course treats mechanisms of IO and the memory hierarchy, various features of traditional machines, advanced features of modern machines such as RISC and multi-processor machines, and file systems and networked and distributed systems such as inter- and intra-nets. Throughout, performance issues are at the center of an analytical approach.

CIS 571 three credits
Compiler Construction
Prerequisite: CIS 471 or equivalent, or permission of instructor
Different techniques for lexical analysis, syntax analysis, and object code generation. Emphasis on code optimization techniques and compiler-construction tools. The course will include a significant project.

CIS 572 three credits
Real Time Systems
Prerequisite: CIS 481 or equivalent, or permission of instructor
Design and implementation of real-time systems. Implementation of real-time system in ADA, scheduling, fault tolerance, and distributed real-time systems are also studied.

CIS 573 three credits
Operating Systems
Prerequisite: CIS 370 or permission of instructor or equivalent,
The methodologies of operating systems design and implementation. Concurrency, synchronization, process communication, switching control, deadlocks, implementation of dynamic structures, design of operating systems modules and interfaces, system security and integrity, and system updating and documentation are also studied.

CIS 574 three credits
Advanced Computer Architectures
Prerequisite: CIS 314 or equivalent, or permission of instructor
Study of recent advances in computer organization. Parallel processors, pipelined processors, modular and network architectures data-flow machines, fault-tolerant systems, language-directed, object-based, capability-based, and message-based processor organizations.

CIS 575 three credits
Parallel Algorithms and Parallel Architectures
Prerequisites: CIS 314, 360 or equivalent, or permission of instructor
Parallel algorithms and their implementations in parallel architectures. In the first part of the course parallel algorithms are analyzed for problems in graph theory, algebra, FFT, and artificial intelligence. The second part presents implementations of these algorithms in various parallel architectures.

CIS 577 three credits
Computer Networks
Prerequisite: CIS 475 or permission of instructor
Analysis and modeling of centralized and distributed computer networks. Queuing network analysis, principles of network design, software considerations, and design of computer networks are also studied.

CIS 578 three credits
Evaluation of Computer Systems Performance
Prerequisite: MTH 331, CIS 314 or equivalent, or permission of instructor.
Techniques of analysis and simulation for evaluation of computer systems performance. Queuing systems, Poisson processes, scheduling, service distribution, conservation laws, queuing networks, and discrete simulations are also studied.

CIS 579 three credits
Multimedia Networking
Prerequisite: CIS 475 or 476 or equivalent
Current techniques in multimedia communications and networking. The course presents the communication requirements of the different types of multimedia applications, the operation of the different underlying communication networks as multimedia carriers, and the communication protocols associated with these networks and gives an overview of the various quality-of-service models, real-time transmission issues, and compression techniques.

CIS 580 three credits
Paradigmatic Software Development
Prerequisite: CIS 311 or equivalent
Software development in the context of various paradigms. The strategies and methods of the procedural, object-oriented, and functional paradigms are studied and practiced. The modeling of software processes will be considered from both the process and product views, as will the appropriateness and measures of effectiveness of these processes in the design of software systems. Students will apply these measures to the course exercises, determining and reviewing the impact of these methods on individual design.

CIS 581 three credits
Design and Verification of Information Systems
Prerequisite: CIS 580 or permission of instructor
Sound design methodologies and technologies in development and maintenance of information systems/business systems with special emphasis on workflow management systems. An applied course that emphasizes the formal approach, this course also addresses issues of adaptability and flexibility of information systems and their evaluation. The course supports concurrent execution of information systems during the design stage and adopts and applies various forms of Petri nets.

CIS 582 three credits
Advanced Software Engineering
Prerequisite: CIS 489 or equivalent, or permission of instructor
Advanced topics in software engineering that examine technical aspects of software

development life cycle. This course introduces software process models including object-oriented process model, formal specification and design, distributed programing, software testing, and agent-oriented software engineering. The concepts are introduced in the context of developing large, critical and distributed software systems.

CIS 583 three credits
Software Architectures
Prerequisite: CIS 475 or equivalent
Course Description: Architectures of Software Systems. The course presents systematically overview and analysis of architectural styles such as pipes and filters, distributed systems, layered systems, event-driven systems, control-based systems, implicit invocation, blackboard systems, etc. Formalization of software architectures with Z and Petri nets is presented. Influence of software architectures on business cycle, software quality, and design reusability are explored.

CIS 585 three credits
Image Processing and Machine Vision
Prerequisite: Graduate standing and permission of the instructor
Foundations of image processing and machine vision. Students apply and evaluate topics such as edge detection, segmentation, shape representation, and object recognition. Stereo vision and motion analysis will be covered in detail including calibration, range images, change detection, motion correspondence, and 2-D and 3-D tracking. Important research papers will be discussed in class.

CIS 588 three credits
Neural Computing
Prerequisite: Any course in programming languages and data structures
Fundamentals of artificial neural networks including application needs for neural networks, discussing the various architectures, learning algorithms and examples of applications. The standard neural networks are discussed in greater details, which allows for branching of architectures and combining of strategies for growing and/or constructing neural networks.

CIS 590 three credits
Optical Networks
Prerequisite: CIS 580
Analysis and design of optical network paradigms and architectures. Introduction to optical components, wavelength division multiplexing, evolution of optical networks, design and analysis of wavelength-routed networks, and optical packet-/burst-switched networks are addressed. Principles of network design, linear programming, protocol and algorithm design, discrete event simulation techniques, and queueing theory are also studied.

CIS 595 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

CIS 596 three credits
Directed Study
Prerequisites: Permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

CIS 600 three credits
Master's Project
Prerequisites: CIS 560, 570, and 580
Provides an experience in the development of a detailed, significant project in computer science under the close supervision of a faculty member, perhaps as one member of a student team. This project may be a software implementation, a design effort, or a theoretical or practical written analysis. Public presentation of the master's project and evaluation by two faculty other than the project supervisor are required.

CIS 601, 602, 603 three credits each
Special Topics
Offered as needed to present advanced material to graduate students.

CIS 690 three credits
Master's Thesis
Prerequisite: Permission of the Graduate Program Committee, based on performance in CIS 600, approval of proposed topic, and support of a faculty advisor and two faculty readers.
Research leading to submission of a formal thesis. This course provides an optional thesis experience, which may be based on the student's Project in a more intense form or be a sequel effort of a different character. In exceptional circumstances, the student may earn up to six thesis credits, if approved by the Graduate Program Committee. Graded A-F.