

2000

School of Computer and Information Sciences Master of Science Degree Program 2000-2001 Catalog

Nova Southeastern University

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School of Computer and Information Sciences

Master of Science Degree Programs

Computer Science

Computer Information Systems

Management Information Systems

Computing Technology in Education



Academic Calendar, Master's Programs (Master's Programs have rolling admissions)

Summer 2000

- May 1–Jun 12 00 Registration period (no late fees)
- Jun 13–26 00 Late registration period (late fees)
- Jun 26 00 First day of term
- Jul 1 00 Drop/add deadline
- Jul 4 00 Holiday
- Sep 4 00 Holiday
- Sep 15 00 Last day to withdraw from a course
with a final grade of W
- Sep 15 00 Last Day of Term

Fall 2000

- Jul 24–Sep 4 00 Registration period (no late fees)
- Sep 5–18 00 Late registration period (late fees)
- Sep 18 00 First day of term
- Sep 23 00 Drop/add deadline
- Oct 9 00 Holiday
- Nov 23–24 00 Holiday
- Dec 8 00 Last day to withdraw from a course
with a final grade of W
- Dec 8 00 Last Day of Term

Winter 2001

- Oct 30–Dec 22 01 Registration period (no late fees)
- Dec 23–Jan 2 01 Late registration period (late fees)
- Jan 2 01 First day of term
- Jan 7 01 Drop/add deadline
- Jan 15 01 Holiday
- Mar 23 01 Last day to withdraw from a course
with a final grade of W
- Mar 23 01 Last Day of Term

Spring 2001

- Jan 29–Mar 16 01 Registration period (no late fees)
- Mar 17–26 01 Late registration period (late fees)
- Mar 26 01 First day of term
- Mar 31 01 Drop/add deadline
- Apr 13 01 Holiday
- May 28 01 Holiday
- Jun 15 01 Last day to withdraw from a course
with a final grade of W
- Jun 15 01 Last Day of Term

Summer 2001

- Apr 30–Jun 15 01 Registration period (no late fees)
- Jun 16–25 01 Late registration period (late fees)
- Jun 25 01 First day of term
- Jun 30 01 Drop/add deadline
- Jul 4 01 Holiday
- Sep 3 01 Holiday
- Sep 14 01 Last day to withdraw from a course
with a final grade of W
- Sep 14 01 Last Day of Term

Fall 2001

- Jul 23–Sep 7 01 Registration period (no late fees)
- Sep 8–17 01 Late registration period (late fees)
- Sep 17 01 First day of term
- Sep 22 01 Drop/add deadline
- Sep 18 01 Holiday
- Sep 27 01 Holiday
- Nov 22–23 01 Holiday
- Dec 7 01 Last day to withdraw from a course
with a final grade of W
- Dec 7 01 Last Day of Term

CONTENTS

In Brief	1
Degrees and Programs	2
Admission	2
Admission for International Students	2
Transfer Credits	3
Orientation and Advisement	3
Financial Aid	3
Tuition and Fees	4
Early Admission into Doctoral Program	4
Thesis and Nonthesis Options	5
Independent Study	5
Program Formats	5
Grade Requirements; Time Limitations	5
Library Resources	6
M.S. in Computer Science	6
M.S. in Computer Information Systems	9
M.S. in Management Information Systems	12
M.S. in Computing Technology in Education	15
Faculty	18
Administrative and Technical Staff	19
Admission Forms	20

A major force in educational innovation, the School of Computer and Information Sciences provides educational programs of distinction to prepare students for leadership roles in computer science, information systems, information science, and computing technology in education. It is distinguished by its ability to offer on-campus, online (via the Internet and World Wide Web), and combined on-campus/online formats that enable professionals to pursue M.S., Ed.D., and Ph.D. degrees without career interruption. The school also welcomes students who wish to earn the M.S. or Ph.D. on a full-time basis.

Ranked by *Forbes* magazine as one of the nation's top 20 cyber-universities, and listed in The Princeton Review's *The Best Distance Learning Graduate Schools*, SCIS pioneered online graduate education with its creation of the electronic classroom, and has been offering online graduate programs and programs with an online component since 1983. All four online M.S. programs are now part of the Southern Regional Electronic Campus (SREC). The school, which has more than 1,100 students, has been awarding graduate degrees since 1980. Its research advances knowledge, improves professional practice, and contributes to understanding in the computer and information sciences.

The school offers programs leading to the M.S. in computer science, computer information systems, management information systems, and computing technology in education; the Ph.D. in computer science, information systems, computer information systems, and information science; and the Ph.D. or Ed.D. in computing technology in education.

The M.S., which is offered on-campus or online, requires 36 credit hours and may be completed in 18 months. To earn the M.S. in 18 months, the student must enroll in two courses each term. Terms are 12 weeks long and there are four terms each year. Master's terms start in September, January, April, and July. SCIS master's students may apply for early admission into the doctoral program. Early admission provides the student the opportunity to earn the Ph.D. or Ed.D. in a shorter time.

Depending on the program, doctoral students may take one of two formats: *cluster* or *institute*. Clusters and institutes bring together students and faculty for participation in courses, seminars, and dissertation counseling. Between meetings, students work on assignments and projects, and participate in online activities that facilitate frequent interaction with the faculty and with other students. Cluster students attend four cluster sessions per year, held quarterly over an extended weekend at the university, during the first two years of their programs. Cluster terms start in March and September. Institute students attend weeklong sessions at the university twice a year at the start of each term. Institute terms start in January and July. Cluster and institute terms are five months long.

Online activities require a computer and an Internet service provider. Online learning methods involve Web pages to access course materials, announcements, the electronic library, and other information, plus a range of activities that facilitate frequent student-professor and student-student interaction. Faculty members and students interact via online forums using threaded bulletin boards, chatrooms, email, electronic classroom sessions, and online submission of assignments in multimedia formats.

Located on a beautiful 232-acre campus in Fort Lauderdale, NSU has approximately 18,000 students and is the largest independent institution of higher education in Florida. It ranks 25th in the size of its graduate programs among the 1,560 universities in the United States with graduate programs and 10th among independent universities. NSU awards bachelor's, master's, educational specialist, doctoral, and first-professional degrees in a wide range of fields. It has an undergraduate college and graduate schools of medicine, dentistry, pharmacy, allied health, optometry, law, computer and information sciences, psychology, education, business, oceanography, and social and systemic studies. To date, the institution has produced approximately 63,000 graduates. Since 1971, NSU has enjoyed full accreditation by the Commission on Colleges of the Southern Association of Colleges and Schools, the regional accrediting body for this region of the United States.

The success of NSU's programs is reflected in the accomplishments of its graduates, among whom are:

- 39 college presidents and chancellors
- more than 100 college vice presidents, provosts, deans, and department chairs
- 65 school superintendents in 16 states, including nine of the nation's largest school districts
- hundreds of college and university faculty members nationwide
- more than 100 high-ranking U.S. military officers, including admirals and generals; business presidents, vice presidents, executives, middle managers, and researchers at companies such as American Express, Ameri-First Bank, AT&T, Bellcore, General Electric, GTE, Harris Corporation, IBM, Lenox China, Motorola, Nortel, Racal Datacom, BellSouth, Westinghouse, and William Penn Bank

Degrees and Programs of the School of Computer and Information Sciences

Master of Science (M.S.)

Computer Science
Computer Information Systems
Management Information Systems
Computing Technology in Education

Doctor of Philosophy (Ph.D.) or Doctor of Education (Ed.D.)

Computer Science (Ph.D.)
Computer Information Systems (Ph.D.)
Information Science (Ph.D.)
Information Systems (Ph.D.)
Computing Technology in Education (Ph.D. or Ed.D.)

Application for Admission to the Master's Degree Program (U.S. Citizens or Permanent Residents)

Admission decisions are made on a rolling basis. Before an application can be considered reviewable by the Admissions Committee, the following items must be received by the Admissions Office: application form, application fee, essay, summary of professional experience or GRE scores, at least two evaluation forms, and transcripts (unofficial copies are acceptable pending receipt of official transcripts). To ensure evaluation for the desired starting term, reviewable applications must be received at least one month prior to the start of that term. Late applications that cannot be processed in time for the desired starting term will be considered for the next term. Applicants may be granted **provisional admission** status pending completion of the application process. Applicants who do not meet all admission requirements may be given **conditional admission** pending removal of deficiencies.

Applicants must meet the general requirements and submit the items specified below and must also satisfy the program-specific admission requirements contained in the individual program sections of this brochure. Detailed instructions for the preparation and mailing of admissions materials are contained in the school's Admission forms, which are at the back of this brochure. Admission forms, brochures, and the graduate catalog may be downloaded from the school's Web site: www.scis.nova.edu.

- a) An earned bachelor's degree from a regionally accredited institution with an appropriate major (see program-specific admission requirements).
- b) Application form, application fee, and essay.
- c) Official transcripts of all graduate and undergraduate education. Transcripts must show an undergraduate GPA of at least 2.5 and a GPA of 3.0 in a major field.
- d) Evaluation forms from three individuals who are familiar with your academic and/or professional capabilities and are able to assess your intellectual abilities, maturity, and motivation. Forms from family members or individuals who are unable to evaluate your academic or professional background are unacceptable.
- e) Summary of Professional Experience or score report of the Graduate Record Examination (GRE).
- f) Proficiency in the English language is a prerequisite for graduate study at the School of Computer and Information Sciences. Master's students are expected to write numerous papers. It is very important to note that grammatical errors, spelling errors, and writing that does not express ideas clearly will affect a student's grades and the completion of his or her degree. The faculty will not provide remedial help concerning grammatical errors or other writing problems. Applicants who are unable to write correctly and clearly are urged to seek remedial help before enrolling in any of the school's programs.

Additional Admission Requirements for International Master's Students

- a) The application fee must be in U.S. dollars.
- b) Online international students who do not live in the United States do not need visas to participate in the program because they do not have to travel to the United States to complete the degree.
- c) Requirements for campus-based students: The university will not enroll any campus-based student who has not been approved initially, or approved for transfer, by the Immigration and Naturalization Services (INS) to attend Nova Southeastern University. The INS requires that all students on an F-1 student visa must enroll full time and attend the main campus only. All students holding J-1 or F-1 visas are required to carry medical insurance. Students on J-1 visas are required to secure an affidavit of support, from an agency or government who will be the financial sponsor, stating that they have a sufficient amount of money to support themselves for the duration of their study. Students on F-1 visas need an affidavit of support and a notarized/attested financial statement proving that they have a sufficient amount of money to support themselves for one academic year (generally nine months). For additional information regarding international students, contact the university's International Student Advising Service at (954) 262-7240 or 800-541-6682, ext. 7240; fax: (954) 262-7265.

- d) Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). A minimum test score of 550 is required for applicants taking the written examination. A minimum test score of 213 is required for applicants taking the computer-based examination. (Scores must be no more than two years old.) Test results must be sent directly to the School of Computer and Information Sciences from TOEFL/TSE Services, P.O. Box 6153, Princeton, NJ, 08541-6153, USA; phone: (609) 771-7100; fax: (609) 771-7500, Web site: www.toefl.org.
- e) The applicant must have a university-level education at least equivalent to an American bachelor's degree in a related field (see specific requirements). Official transcripts must show an equivalent undergraduate GPA of at least 2.5 and an equivalent GPA of 3.0 in a major field. Official documents must be certified by an officer of the institution attended and must show all post-high-school work including grades in each course and standing in examinations and classes. Documents issued in a language other than English must be accompanied by a certified English translation from an NSU-approved agency. Translations made by applicants are not acceptable. In cases where the original academic records do not state that a degree has been awarded, certified copies of the original diploma and certificate of graduation must be submitted. To transfer graduate credits from a foreign institution, a student must have his or her transcript evaluated, on a course-by-course basis, by an NSU-approved agency.
- f) Nondegree or provisional admission status is not considered a basis for the issuance of an I-20. After applicants receive a written offer of admission, the I-20 will be provided, upon request, to those who have verified financial support and require an F-1 student visa. International students must enter the United States on a valid student or other visa. Nonresident aliens currently in the United States must have a valid student or nonimmigrant visa (except B1/B2 visa) for enrollment in the university. Students sponsored by the United States government or their home government are required to enter the United States on an exchange visitor's visa (J-1).

Provisional or Conditional Admission

A degree-seeking applicant who has missing documents but appears to be acceptable based on documents received by SCIS may be offered **provisional admission**. Official admission will be granted upon receipt and acceptability of the remaining required documents. All missing documents must be submitted prior to the student's second registration. Examples of missing documents are an official transcript and an evaluation form. An applicant who has not met all admission requirements may be given **conditional admission** if sufficient evidence exists to suggest the ability to perform successfully in the program. A student with conditional status must remove stated deficiencies as specified in the acceptance letter.

Transfer Credit Policy

Up to six graduate credits may be transferred from a regionally accredited institution. Courses proposed for transfer must have received grades of at least B. Students must request approval of transfer credits in writing at the time of application (see instruction on the application form). Copies of catalog course descriptions or course syllabi are required to process requests for transfer credits.

Orientation and Advisement Program

New students are provided a Web-based orientation that includes computer/software requirements, online access, tools and methods, and library access. A guide to the school's online learning environment can be downloaded, and a hard copy is provided to each student. The school's Web site provides an extensive online "help" system including downloadable software and documents. Advisement is provided by the master's program office and the faculty.

Financial Aid

The Office of Student Financial Assistance administers the university's financial aid programs of grants, loans, scholarships, and student employment, and provides professional financial advisers to help students plan for the most efficient use of their financial resources for education. In order to participate in financial aid programs, a student must be admitted into a university program, and must be a citizen, a national, or a permanent resident of the United States, or be in the United States for other than a temporary purpose. **A prospective student who requires financial assistance must apply for financial aid while he or she is a candidate for admission. Students/applicants may apply for financial aid online at www.nova.edu/cwis/finaid. Students must work directly with the university's Office of Student Financial Assistance because the school's program office does not administer or manage the financial aid process.** For information or application forms call (954) 262-3380, 800-806-3680, or send email to lordcarl@nova.edu or finaid@nova.edu. To continue financial aid, at a minimum, enrolled students must demonstrate satisfactory academic progress toward a stated educational objective in accordance with the university's policy on satisfactory progress for financial aid recipients.

Tuition and Fees (Rates are subject to change. Textbooks are not included and must be purchased separately.)

Tuition	\$395 per credit hour
Application Fee.....	\$50 nonrefundable
Registration Fee.....	\$30 nonrefundable
Late Registration Fee.....	\$100 nonrefundable
Reinstatement Fee.....	\$50 nonrefundable
Program Change Fee	\$100 nonrefundable
Graduation Fee.....	\$75
Deferment Fee for Installment Payment.....	\$50
Continuing Services.....	\$160 (leave of absence with online privileges per term)

Tuition Payment Policy

Tuition and fees may be satisfied with payment by check, money order, credit card, or official financial aid award letter with associated financial aid documentation. Cash will not be accepted as payment for tuition and fees unless paid at the Office of the University Bursar. All postdated checks or credit card authorizations will be held by the university for processing until the due dates specified in this policy. The tuition payment policy is subject to change at any time at the discretion of the administration of Nova Southeastern University. There are five options available for the payment of tuition. These options are described below:

- a) *Full payment by the student:* Full payment of tuition and fees is to be made at the time of registration. Registration after the registration period, when permitted, will involve payment of a late registration fee.
- b) *Installment payment by the student (students attending on an I-20 are not eligible for this option):* This plan requires three payments spread over the first 90 days of the term. The first payment must be made by check, money order, or credit card. At the time of registration, the student must submit postdated checks or credit card authorizations for the second and third installments. The first payment, due at registration, includes all fees, 50 percent of the tuition, plus a \$50 deferment fee. The second payment, due 60 days from the beginning of the term, shall equal 25 percent of the tuition. The third payment, due 90 days from the beginning of the term, shall equal 25 percent of the tuition. **Registrations received without the three payments cannot be processed.**
- c) *Direct payment by the student's employer:* If a letter of commitment or a voucher from the student's employer accompanies the registration form, then the student will not be required to make a payment at registration time. The letter of commitment or the voucher must indicate that the employer will remit full payment of tuition and fees to Nova Southeastern University upon receipt of the invoice from the university's accounts receivable office.
- d) *Tuition reimbursement by the student's employer:* If the student submits a letter from the employer at registration time that establishes eligibility for tuition reimbursement, the student may choose a two-payment plan. The first payment, due at registration, shall include all fees, 50 percent of the tuition, plus a \$50 deferment fee. The second payment, due five weeks after the end of the term, shall equal 50 percent of the tuition. To secure this plan, the student must provide, at registration, a postdated check or credit card authorization for the deferred portion.
- e) *Financial aid award:* If a student has received an official financial aid award letter and all documents have been completed, then the student may register without payment.

Early Admission into the Doctoral Program (See *SCIS Graduate Catalog* for details and specific options.)

This option provides the school's M.S. students the opportunity to earn the doctorate in a shorter time. Minimum requirements for early admission are the completion of 24 credits in the M.S. program with a GPA of 3.5 or higher and the completion of specific master's courses (see the school's catalog for details). If admitted into the doctoral program, students will take the remaining 12 credits for the M.S. degree in the doctoral program. Master's students may apply for early admission no sooner than during the term in which they will be completing 24 credits. Students must submit applications for early admission to the SCIS Admissions Office. An Early Admission Application Package may be downloaded from the SCIS Web site.

The application must include: (1) an application form; (2) a comprehensive curriculum vitae; (3) evaluations from at least two SCIS faculty members familiar with the student's course work (use form included with the application package); (4) an essay (not exceeding 1,000 words) discussing the student's academic and professional goals in relation to the doctoral program and identifying potential areas or topics in which the student expects to pursue dissertation research (essay must contain a Certification of Authorship); and (5) official transcripts of graduate courses taken at other institutions while an SCIS M.S. student. The admissions committee may request samples of the student's academic writing. The SCIS Admissions Office will supply the admissions committee with the student's current transcripts. An application fee is not required. Upon successful completion of 12 credits in the doctoral program, the student may apply for the master's degree (contact the master's program office for a degree application).

Thesis and Nonthesis Options

For the thesis option, 30 credit hours of course work and six credit hours for the master's thesis are required. For the nonthesis option, 36 credit hours of course work are required. Students interested in completing the master's thesis should contact the master's program office to make arrangements.

Term Dates

Four 12-week terms are offered each year. Terms start in September, January, April, and July. (The Academic Calendar for the master's program is printed on the inside of the front cover of this brochure.)

Program Formats

The 36-credit hour program is designed so it may be completed by full-time students in 12 months or by working professionals in 18 months while remaining in their current positions. To earn the degree in 12 months, students must enroll in three courses per term. To earn the degree in 18 months, students must enroll in two courses per term. Terms are 12 weeks long and there are four terms each year. Students select one of two formats: *online* or *on-campus* (on-campus is not available for the M.S. in computing technology in education). With the permission of the program office, a student in one format may take a course in another format.

The online format requires the completion of 12 courses via online techniques or 10 online courses and a six-credit thesis (see section on thesis option). Students participate in online courses from anywhere in the world where Internet access is available.

The on-campus format requires the completion of 12 courses or 10 courses and a six-credit thesis (see section on thesis option). Classes are held on the campus in Fort Lauderdale. Each class meets once a week from 6:30 p.m. to 9:30 p.m. for 12 weeks.

All SCIS students are provided NSU computer accounts but must obtain their own Internet service providers and use their own computer systems. New students are provided an orientation on computer and software requirements, online access, online tools and methods, and library resources. Students use the Web to access course materials, announcements, email, the electronic library, and other information, and for interaction with faculty and fellow students. Online activities may include Web pages, forums using threaded bulletin boards, and chatrooms. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive the professor's online reviews of assignments in the same multimedia formats. Some online courses may include electronic classroom sessions.

Grade Requirements and Time Limitations

Students must maintain a cumulative grade point average of at least 3.0 for the duration of their master's degree program. Failure to do so will result in probation and possible dismissal. Students in a master's degree program must complete requirements for the degree within five years from the date of their first registration.

Independent Study and Directed Independent Study

A student wishing to take an existing course on an independent-study basis must first obtain written approval from the faculty member responsible for the course, and then forward a request to the program office for final approval. A student interested in conducting study, research, or creative activities under the supervision of a faculty member in areas not normally covered in any regular course may request permission from a faculty member and the program office to register for directed independent study.

Cross-Registration

Students may apply to cross-register for courses offered in other SCIS master's degree programs. Approval for cross-registration must be obtained from the master's program office prior to registration.

Library Resources

Students must be registered in order to use the university's library services. NSU's library system comprises the Einstein Library, Health Professions Division Library, Law Library, East Campus Library, North Miami Beach Fischler Graduate School of Education and Human Services Media Union, Oceanographic Library, and four school libraries on the main campus. The catalogs of all NSU libraries are accessible for remote searching (as are catalogs of other university libraries) to online students via the Electronic Library. Online and CD-ROM databases complement the paper-based holdings and provide full-text resources.

Interlibrary loan arrangements through networked organizations such as the Online Computer Library Center (OCLC), the Southeast Florida Library Information Network (SEFLIN), the Consortium of Southeastern Law Libraries (COSELL), and the National Library of Medicine provide broad access to a wide range of materials. The library also has lending agreements with large research libraries in the Midwest, which provide priority document delivery services to students. The Einstein Library is a cooperating library of the Foundation Center in New York, giving students access to collections for grants and foundation research.

Online students have access to books, journal articles, microfiche, dissertations, index searches, catalog searches, and reference librarians. Distance students may request library materials using fax, mail, or online forms. To contact Distance Library Services (DLS) by phone, call 800-541-6682, ext. 4602 or (954) 262-4602. Use the toll-free fax to order library materials: 888-347-3627 (in Broward County, fax 262-3947). Students can send email to DLS: library@nova.edu, or can reach DLS via the Web: www.nova.edu/library. All materials mailed by the DLS office are sent by first-class mail. When books are borrowed, the student will have to pay a small charge for third-class postage to return the books. Books are loaned for one month. Periodical copies or ERIC documents need not be returned.

Additional Information on Policies and Procedures

For additional information on policies and procedures consult the graduate catalog of the School of Computer and Information Sciences located on the school's Web site: www.scis.nova.edu.

Master of Science (M.S.) in Computer Science

This program offers a course of study leading to the master of science (M.S.) in computer science. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. The curriculum is consistent with recommendations for a model curriculum in computer science as outlined by the Association of Computing Machinery (ACM). Official information about programs and policies is contained in the graduate catalog of the School of Computer and Information Sciences.

Program-Specific Admission Requirements (See pp. 2–3 for general admission requirements.)

This program is designed for students with undergraduate majors in computer science, engineering, mathematics, or physics and who have completed courses or have equivalent experience in data structures and algorithms, assembly language, computer architecture, structured programming in a modern high-level language, systems software (compilers or operating systems), calculus (differential and integral calculus), and discrete mathematics. An applicant who does not have an adequate background may be required to take one or more of the following 500-level graduate courses during the first two terms of the student's program. These are in addition to the required 36 credit hours of courses at the 600 level. Courses at the 500 level, when required, must be completed prior to taking courses at the 600 level; however, some exceptions may be permitted by the program office. Students must earn a B or better in 500-level courses. Grades for 500-level courses are not included in the student's GPA. MCIS 501 is prerequisite to MCIS 503.

MCIS 500 Assembly Language and Architecture
MCIS 501 Java Programming Language

MCIS 502 Mathematics in Computing
MCIS 503 Data Structures and Algorithms

The Curriculum for the M.S. in Computer Science

Core courses and electives are listed below. The student may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. Plans for the thesis option must be made with the program office. A student wishing to register for for CISC 691, Project in Computer Science, must first obtain the approval of the faculty member who would supervise the project.

Core Courses:

CISC 610 Programming Languages
CISC 615 Design and Analysis of Algorithms
CISC 630 Compiler Design Theory
CISC 640 Operating Systems Theory and Design
CISC 650 Data Communications Networks
CISC 660 Database Management Systems
CISC 665 Client-Server Computing
CISC 670 Artificial Intelligence
CISC 680 Software Engineering
CISC 681 Interactive Computer Graphics
CISC 683 Object-Oriented Design
CISC 685 Human-Computer Interaction

Electives:

CISC 620 Modeling and Simulation
CISC 622 Numerical Analysis
CISC 631 Language Theory and Automata
CISC 632 Compiler Implementation
CISC 644 Operating Systems Implementation
CISC 647 Advanced Computer Architecture
CISC 651 Project in Data Communications Networks
CISC 654 Computer Security
CISC 661 Database Management Systems Implementation
CISC 663 Object-Oriented Database Systems
CISC 682 Software Engineering Implementation
CISC 688 Continuing Thesis in Computer Science
CISC 690 Special Topics in Computer Science
CISC 691 Project in Computer Science

Course Descriptions for the M.S. in Computer Science

CISC 610 Programming Languages (3 credits)

Formal languages and language hierarchies, syntactic and semantic specification, abstract machines and corresponding languages, context-free languages, abstraction, modularity, and program structure. Fundamental programming language concepts. Analysis of imperative, object-oriented, and declarative language paradigms. Several programming languages will be analyzed.

CISC 615 Design and Analysis of Algorithms (3 credits)

Topics include sorting, algorithms for tree structures, dynamic programming, greedy methods, advanced data structures, divide and conquer, graph algorithms, arithmetic operations, algorithms for parallel computers, matrix operations, string/pattern matching, network problems, approximation algorithms, and NP-completeness.

CISC 620 Modeling and Simulation (3 credits)

Use of logical and mathematical models to represent and simulate events and processes as well as computer, information, and communications systems. Introduction to computer modeling techniques and discrete-event simulation. Model development and testing. Output and problem analysis. Application of techniques to a multiprocessor system model and an Ethernet model. Examination of development programs such as GPSS, SIMULA, and SIMSCRIPT.

CISC 622 Numerical Analysis (3 credits)

Introduction to error analysis, iterative methods, eigenvalue problems, integration and differentiation by computer, interpolation, and ill-conditioned problems.

CISC 630 Compiler Design Theory (3 credits)

Language theory will be applied to the design of a compiler for a high-level language. Parsing, syntax analysis, semantic analysis, and code generation. Other areas of the compilation process will be covered, such as storage allocation, symbol table management, searching and sorting, and optimization.

CISC 631 Language Theory and Automata (3 credits)

Introduction to formal grammars, Backus-Naur notation. The formal theory behind the design of a computer language is studied. The corresponding types of automata that may serve as recognizers and generators for a language will be described.

CISC 632 Compiler Implementation (3 credits)

Design, implementation, and testing of a compiler for a high-level language. The project will utilize state-of-the-art compiler generation tools, including parser generators and code-generator generators. Prerequisite: CISC 630.

CISC 640 Operating Systems Theory and Design (3 credits)

Analysis of computer operating systems with emphasis on structured design. Multiprogramming and multiprocessing, real time, time-sharing, networks, job control, scheduling, synchronization, and other forms of resource management, I/O programming, and memory and file system management.

CISC 644 Operating Systems Implementation (3 credits)

Implementation and testing of operating system designs. Prerequisite: CISC 640.

CISC 647 Advanced Computer Architecture (3 credits)

Organizational structures of computer systems and subsystems. Topics include processor organization, memory organization, virtual memory, microarchitecture, I/O controllers and processors, architectures for complex instruction set computers (CISC) and reduced instruction set computers (RISC), performance evaluation, multiprocessors, and parallel architectures.

CISC 650 Data Communications Networks (3 credits)

This course covers detailed technical concepts of data networks, network components, associated network technologies, and data communications protocols. Technical specification, design, testing, and managing and updating of data networks from legacy systems through terabit networks are discussed. Detailed technical examination of associated network components (modems, multiplexers, hubs, gateways, etc.), guided and unguided media (wire, coax, fiber, terrestrial and satellite microwave, etc.), and routing and high-speed switching systems. Network architecture topics include software and conceptual models (OSI, TCP/IP, HDLC and SDLC, SNA, AIX, etc.), error detection and prevention systems, transfer and routing protocols, congestion and flow control, and current and future applications (SNMP2, HTTP, X.400/500, ANS.1, ISDN and B-ISDN, ultra-high-speed networks, etc.).

CISC 651 Project in Data Communications Networks (3 credits)

Students pursue a project, research study, or implementation in data and computer communications. Prerequisite: CISC 650.

CISC 654 Computer Security (3 credits)

Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

CISC 660 Database Management Systems (3 credits)

Principles of database management systems. Topics include concepts of database architectures such as three-schema architectures, logical and physical data organizations, data models for database systems (network model, hierarchical model, relational model, and object-oriented model), relational algebra and calculus, query languages, design theory for relational databases, functional dependencies and normal forms, null values and partial information, semantic data modeling, transaction management and concurrency control, index schema, file structures and access methods, query systems and query optimization, view management, client-server database architectures, distributed databases, object-oriented databases, logic-based databases, and the current research and development trends of database systems.

CISC 661 Database Management Systems Implementation (3 credits)

Techniques of database management will be applied to practical projects. Prerequisite: CISC 660.

CISC 663 Object-Oriented Database Systems (3 credits)

Object-oriented data models and other data models with semantic extensions such as functional data models, object-oriented database query model and languages, object-oriented database schema evolution and modification, version management and control, object data storage structure (clustering and indexing), query processing and transaction management, authorization mechanism and security, integrating object-oriented programming and databases, and applications of object-oriented databases. Prerequisite: CISC 660 or equivalent.

CISC 665 Client-Server Computing (3 credits)

Concepts and principles of client-server architecture, security, networks, and distributed computing. Topics include IPC, RPC, sockets, the role of the GUI and front-end development tools, middleware, two-tier and three-tier architectures, operating systems, and database interaction. The role of standards in client-server development is discussed, including DCE, CORBA, ODBC, COM, and OLE, along with object-oriented aspects of client-server and distributed computing. Discussions include the various relationships between client-server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements.

CISC 670 Artificial Intelligence (3 credits)

Basic principles and techniques of artificial intelligence will be covered. Concepts of knowledge representation including formalized symbolic logic, inconsistency and uncertainty, probabilistic reasoning, and structured knowledge will be presented. Other areas are (1) knowledge organization and manipulation including search and control strategies, matching techniques, and knowledge management; (2) perception and communication including natural language processing and pattern recognition; and (3) the architecture of expert systems.

CISC 680 Software Engineering (3 credits)

The development of software-intensive systems; software quality factors; software engineering principles; system life-cycle models; requirements definition and analysis; behavioral specification; software design; implementation; software testing techniques; verification and validation; system evolution; software project management.

CISC 681 Interactive Computer Graphics (3 credits)

Principles of interactive computer graphics. Concepts include fundamental raster operations, such as scan conversion, fill methods, and anti-aliasing; transformations; graphic languages, such as PHIGS and Open GL; projection; hidden surface removal methods; 3D modeling techniques; ray tracing; animation; and graphical user interfaces.

CISC 682 Software Engineering Implementation (3 credits)

Techniques of software engineering will be applied in projects. Prerequisite: CISC 680.

CISC 683 Object-Oriented Design (3 credits)

The concepts and principles of the object-oriented paradigm. Approaches to analyzing and modeling a system using object-oriented techniques. Techniques for the design of objects, classes, and modules. The use of inheritance to enhance reusability. Object-oriented analysis and object-oriented programming.

CISC 685 Human-Computer Interaction (3 credits)

Focuses on the dynamics of human-computer interaction (HCI). Provides a broad overview of HCI as a sub-area of computer science and explores user-centered design approaches in information systems applications. Addresses the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

CISC 688 Continuing Thesis in Computer Science (1.5 credits)

Students who have not completed the thesis by the end of the second thesis registration must register for continuing thesis. This allows the student to receive faculty and administrative advice and support related to the thesis. Prerequisite: Completion of second thesis registration.

CISC 690 Special Topics in Computer Science (3 credits)

This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

CISC 691 Project in Computer Science (3 credits)

Students pursue a project, research study, or implementation under the supervision of a faculty member.

CISC 699 Master's Thesis in Computer Science (3 credits)

The student develops a framework within which research will be conducted and offers evidence of qualifications to pursue the research. Concepts and theories underlying the student's thesis research are articulated, the problem is clearly stated, specific, measurable goals are specified, a literature review is presented, the methods of conducting research are delineated, and strategy to achieve the goal is given. Registration for CISC 699 must be repeated for three more credits, for a total of six thesis credits. Prerequisite: Completion of eight courses.

Master of Science (M.S.) in Computer Information Systems

This program offers a course of study leading to the master of science (M.S.) in computer information systems. It focuses on the technological foundations of computer information systems, including areas such as database systems, human-computer interaction, data and computer communications, computer security, computer graphics, software engineering, and object-orientation. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. The curriculum is consistent with recommendations for a model curriculum in computer information systems as outlined by the Association of Computing Machinery (ACM). Official information about programs and policies is contained in the graduate catalog of the School of Computer and Information Sciences.

Program-Specific Admission Requirements (See pp. 2–3 for general admission requirements.)

This program is designed for students with undergraduate majors in computer science, information systems, engineering, mathematics, or physics. Applicants must have knowledge of data structures and algorithms, assembly language and computer architecture, structured programming in a modern high-level language, college algebra, and discrete mathematics. An applicant who does not have an adequate background in mathematics or computer concepts may be required to take one or more of the following 500-level graduate courses during the first two terms of the student's program. Courses at the 500 level, when required, must be completed prior to taking courses at the 600 level; however, some exceptions may be permitted by the program office. Students must earn a B or better in 500-level courses. Grades for 500-level courses are not included in the student's GPA. MCIS 501 is prerequisite to MCIS 503.

MCIS 500 Assembly Language and Architecture

MCIS 501 Java Programming Language

MCIS 502 Mathematics in Computing

MCIS 503 Data Structures and Algorithms

The Curriculum for the M.S. in Computer Information Systems

Core courses and electives are listed below. Students may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. Plans for the thesis option must be made with the program office. A student wishing to register for for MCIS 682, Project in Information Systems, must first obtain the approval of the faculty member who would supervise the project.

Core Courses:

MCIS 611 Survey of Programming Languages
MCIS 615 Operating Systems Concepts
MCIS 620 Information Systems
MCIS 625 Computer Graphics
MCIS 630 Database Systems
MCIS 645 Software Engineering
MCIS 650 Data Communications Networks
MCIS 661 Object-Oriented Applications
MCIS 665 Client-Server Computing
MCIS 670 Artificial Intelligence and Expert Systems
MCIS 671 Decision Support Systems
MCIS 680 Human-Computer Interaction

Electives:

MCIS 621 Information Systems Project Management
MCIS 623 Legal and Ethical Aspects of Computing
MCIS 631 Database Systems Project
MCIS 651 Project in Data Communications Networks
MCIS 652 Computer Security
MCIS 654 Electronic Commerce on the Internet
MCIS 681 Multimedia Systems
MCIS 682 Project in Information Systems
MCIS 688 Continuing Thesis in Computer Information Systems
MCIS 691 Special Topics in Computer Information Systems

Course Descriptions for the M.S. in Computer Information Systems

MCIS 500 Assembly Language and Architecture (3 credits)

A comprehensive examination of the fundamental concepts and architectural structures of contemporary computers. The course focuses on assembly language programming and the influence of low-level computer architecture on modern computer applications.

MCIS 501 Java Programming Language (3 credits)

An in-depth study of the Java programming language. Principles of the object-oriented paradigm. Object-oriented programming theory and practice.

MCIS 502 Mathematics in Computing (3 credits)

Graph theory, lattices and boolean algebras, state models and abstract algebraic structures, logical systems, production systems, computability theory, recursive function theory.

MCIS 503 Data Structures and Algorithms (3 credits)

Sorting and searching, algorithms for tree structures, advanced data structures, graph algorithms, complexity, dynamic programming, optimization problems. Prerequisite: MCIS 501 or equivalent.

MCIS 611 Survey of Programming Languages (3 credits)

Organization and types of programming languages. Analysis of imperative, object-oriented, and declarative language paradigms. Higher-level languages. Comparative analysis of programming languages used in the development of computer information systems.

MCIS 615 Operating Systems Concepts (3 credits)

Objectives of managing computer system resources. Memory management, process management, file system management, scheduling, synchronization, interrupt processing, distributed processing, and parallel systems. An analysis of the role of operating systems in computer information systems development, operation, and evolution.

MCIS 620 Information Systems (3 credits)

Covers major concepts and architecture of computer information systems, including information concepts; information flow; types of information systems; the role of information in planning operations, control, and decision making; integrated information systems across a range of functional elements. Computer information systems in organizations.

MCIS 621 Information Systems Project Management (3 credits)

Life-cycle models/paradigms. Project planning and risk analysis. Project control including work breakdown structures, project scheduling, activities, and milestones. Software cost-estimation techniques/models. Software quality assurance and metrics for software productivity and quality. Inspections, walkthroughs, and reviews. Approaches to team organization. Configuration management. Automated project management tools. Software maintenance. Information system security. Procurement of software services and systems. Management of operational systems. Legal/ethical issues associated with CIS and software.

MCIS 623 Legal and Ethical Aspects of Computing (3 credits)

Focuses on issues that involve computer impact on society and related concerns. Transitional data flow; copyright protection; information as a source of economic power; rights to access computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing; current and anticipated uses of computer prediction; and protection of personal ethical concerns. National computer policies of Japan, France, Great Britain, and the European Economic Community. The status of regulation and emerging standards.

MCIS 625 Computer Graphics (3 credits)

Presents computer graphics as an aid to information managers who need a clear means of presenting the analysis of information. Topics include basic graphic techniques (e.g., histograms, bar charts, pie charts), the theory of graphic presentation of information, desktop publishing software, presentation software, graphics monitors (EGA, CGA, VGA, RGB, composite), laser printers, computer-screen projection systems, and standards.

MCIS 630 Database Systems (3 credits)

Methodologies and principles of database analysis and design are presented. Conceptual modeling and specifications of databases, database design process and tools, functional analysis and methodologies for database design, entity relationship model and advanced semantic modeling methods are discussed. Topics include theories of database systems, including the architectures of database systems, logical and physical database organizations, data models for database systems (network, hierarchical, relational, and object-oriented model), relational algebra and calculus, query languages, normal forms, null values and partial information, relational database design utilizing dependencies, view design and integration, concurrency control, query optimization, client-server database applications, distributed databases, object-oriented databases, and the current research and development trends of database analysis, design, modeling, and applications.

MCIS 631 Database Systems Project (3 credits)

The techniques of database management systems are applied to practical projects. Prerequisite: MCIS 630.

MCIS 645 Software Engineering (3 credits)

The development of software-intensive systems; software quality factors; software engineering principles; system life-cycle models and paradigms; requirements definition and analysis; behavioral specification; software design; implementation; software testing techniques; verification and validation; system evolution; software project management.

MCIS 650 Data Communications Networks (3 credits)

This course covers the technical concepts of data networks, network components, associated network technologies, and data communications protocols. Specification, design, testing, managing, and updating of data networks from legacy systems through terabit networks are discussed. Examination of associated network components (modems, multiplexers, hub, gateways, etc.), guided and unguided media (wire, coax, fiber, terrestrial, and satellite microwave, etc.), and routing and high-speed switching systems. Network architecture topics include software and conceptual models (OSI, TCP/IP, HDLC and SDLC, SNA, AIX, etc.), error detection and prevention systems, transfer and routing protocols, congestion and flow control, and current and future applications (SNMP2, HTTP, X.400/500, ANS.1, ISDN and B-ISDN, ultra-high-speed networks, etc.).

MCIS 651 Project in Data Communications Networks (3 credits)

Students pursue a project, research study, or implementation in data communications networks. Prerequisite: MCIS 650.

MCIS 652 Computer Security (3 credits)

Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

MCIS 654 Electronic Commerce on the Internet (3 credits)

Electronic commerce has grown at an incredible rate, and experts forecast extraordinary growth over the near-term and long-term. It will be examined from three perspectives: (1) customer-business; (2) business-business; and (3) intra-organization. The Internet, intranets and extranets, electronic data interchange (EDI), security, electronic payment systems, tax issues, and global policy will be investigated. The student will participate in an Internet shopping experience and create or enhance a Web page.

MCIS 661 Object-Oriented Applications (3 credits)

Principles of the object-oriented paradigm. Application of object-oriented methods in computer information systems. Object-oriented languages and design methods for class creation. Study of the use of object-oriented techniques in applications such as user interfaces, graphics, database systems, visual programming, hypermedia, office automation systems, and decision support systems. Techniques for software reuse.

MCIS 665 Client-Server Computing (3 credits)

Concepts and principles of client-server architecture, security, networks, and distributed computing. Topics include IPC, RPC, sockets, the role of the GUI and front-end development tools, middleware, two-tier and three-tier architectures, operating systems, and database interaction. The role of standards in client-server development is discussed, including DCE, CORBA, ODBC, COM, and OLE, along with object-oriented aspects of client-server and distributed computing. Discussions include the various relationships between client-server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements.

MCIS 670 Artificial Intelligence and Expert Systems (3 credits)

Includes an introduction to artificial intelligence as well as historical and current trends and characterization of knowledge-based systems. Search, logic and deduction, knowledge representation, production systems, and expert systems will be examined. Additional areas include architecture of expert systems and criteria for selecting expert system shells, such as end-user interface, developer interface, system interface, inference engine, knowledge base, and data interface. The student will use a commercial shell to build a working expert system.

MCIS 671 Decision Support Systems (3 credits)

Examines concepts of decision support in both nonautomated and automated environments. Focuses on structures, modeling, and the application of various decision support systems in today's corporate environment. Additional emphasis is placed on the use of executive information and expert system applications. Case studies examine applications of each of these types of technology.

MCIS 680 Human-Computer Interaction (3 credits)

Focuses on the dynamics of human-computer interaction (HCI). Provides a broad overview of HCI as a sub-area of computer science and explores user-centered design approaches in information systems applications. Addresses the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

MCIS 681 Multimedia Systems (3 credits)

Introduction to multimedia systems. Definition of terms and concepts related to multimedia. Trends in the development and the use of multimedia. Tools, techniques, and guidelines facilitating the planning, design, production, and implementation of multimedia products.

MCIS 682 Project in Information Systems (3 credits)

Students pursue a project, research study, or implementation under the supervision of a faculty member.

MCIS 688 Continuing Thesis in Computer Information Systems (1.5 credits)

Students who have not completed the thesis by the end of the second thesis registration must register for continuing thesis. This allows the student to receive faculty and administrative advice and support related to the thesis. Prerequisite: Completion of second thesis registration.

MCIS 691 Special Topics in Computer Information Systems (3 credits)

This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

MCIS 699 Master's Thesis in Computer Information Systems (3 credits)

The student develops a framework within which research will be conducted and offers evidence of qualifications to pursue the research. Concepts and theories underlying the student's thesis research are articulated, the problem is clearly stated, specific, measurable goals are specified, a literature review is presented, the methods of conducting research are delineated, and strategy to achieve the goal is given. Registration for MCIS 699 must be repeated for three more credits, for a total of six thesis credits. Prerequisite: Completion of eight courses.

Master of Science (M.S.) in Management Information Systems

This program offers a course of study leading to the master of science (M.S.) in management information systems. It focuses on the application of information system concepts to the collection, retention, and dissemination of information for management planning and decision making. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. Official information about programs and policies is contained in the graduate catalog of the School of Computer and Information Sciences.

Program-Specific Admission Requirements (See pp. 2-3 for general admission requirements.)

This program is designed for students with undergraduate majors in management information systems, computer information systems, business administration, or a related field, and having knowledge and significant experience in computer applications. Experience with the Internet is preferred. Students who cannot demonstrate competence in programming in a high-level language such as C, C++, or Java must take MMIS 501, Introduction to Java Programming, during the first term of their registration in the program. Students must earn a B or better in 500-level courses. Grades for 500-level courses are not included in the student's GPA.

The Curriculum for the M.S. in Management Information Systems

Core courses and electives are listed below. The student may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. Plans for the thesis option must be made with the program office. A student wishing to register for for MMIS 682, Project in Management Information Systems, must obtain the approval of the faculty member who would supervise the project.

Core Courses:

MMIS 610 Survey of Computer Languages
MMIS 620 Management Information Systems
MMIS 621 Information Systems Project Management
MMIS 626 Client–Server and Distributed Computing
MMIS 630 Database Systems
MMIS 642 Data Warehousing
MMIS 653 Telecommunications and Computer Networking
MMIS 654 Electronic Commerce on the Internet
MMIS 660 Systems Analysis and Design
MMIS 661 Object-Oriented Applications
MMIS 671 Decision Support Systems
MMIS 680 Human-Computer Interaction

Electives:

MMIS 611 Computer Structures and Algorithms Using COBOL
MMIS 615 Quantitative Methods
MMIS 623 Legal and Ethical Aspects of Computing
MMIS 625 Computer Graphics
MMIS 631 Database Systems Project
MMIS 640 System Test and Evaluation
MMIS 652 Computer Security
MMIS 670 Artificial Intelligence and Expert Systems
MMIS 681 Multimedia Systems
MMIS 682 Project in Management Information Systems
MMIS 688 Continuing Thesis in MIS
MMIS 691 Special Topics in MIS

Course Descriptions for the M.S. in Management Information Systems

MMIS 501 Introduction to Java Programming (3 credits)

This course is an introduction to the Java programming language. The course will include an introduction to the concepts of object-oriented programming and will show how Java supports this programming paradigm. You will learn about the Java environment and will write both applets (programs that execute in a Web browser) and applications (stand alone program). In addition to learning about basic language statements, you will also learn how Java provides support for such diverse applications as Web pages, multimedia, educational, etc.

MMIS 610 Survey of Computer Languages (3 credits)

A study of high-level languages, fourth-generation languages, and command languages used in the development of software for management information systems. The logical and physical structure of programs and data. Concepts of structured programming. Data structures, file management, and their use in problem-solving. Students will complete a variety of high-level language computer programs.

MMIS 611 Computer Structures and Algorithms Using COBOL (3 credits)

Data and file structure concepts, data record format and file organization, sequential vs. random file access methods, tree-based file structure and search techniques, indexing and data clustering, multiway sort/merge and sort algorithms, input/output blocking and buffering. The student will design and implement programs in COBOL.

MMIS 615 Quantitative Methods (3 credits)

An introduction to the basic quantitative tools needed to support problem solving and decision making in the information systems environment. Heavy emphasis is placed on the application of these tools in a case-based, real-world environment.

MMIS 620 Management Information Systems (3 credits)

The application of information system concepts to the collection, retention, and dissemination of information for management planning and decision making. Issues such as personnel selection, budgeting, policy development, and organizational interfacing are discussed. Conceptual foundations and planning and development of management information systems. The role of MIS in an organization and the fit between the system and the organization.

MMIS 621 Information Systems Project Management (3 credits)

Practical examination of how projects can be managed from start to finish. Life-cycle models and paradigms. Life-cycle phases. Project planning and risk analysis. Project control including work breakdown structures, project scheduling, activities, and milestones. Software cost estimations techniques/models. Software quality assurance and metrics for software productivity and quality. Inspections, walkthroughs, and reviews. Approaches to team organization. Documentation and configuration management. Automated project management tools. Software maintenance. Procurement of software services and systems.

MMIS 623 Legal and Ethical Aspects of Computing (3 credits)

Focuses on issues that involve computer impact and related societal concerns. Topics include transitional data flow; copyright protection; information as a source of economic power; rights to access to computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing; current and anticipated uses of computer prediction; and protection of personal ethical concerns. National computer policies of Japan, France, Great Britain, and the EEC, and the status of regulation and emerging standards.

MMIS 625 Computer Graphics (3 credits)

Presents computer graphics as an aid to information managers who need a clear means of presenting the analysis of information. Topics include basic graphic techniques (e.g., histograms, bar charts, pie charts), the theory of graphic presentation of information, desktop publishing software, presentation software, graphics monitors (EGA, CGA, VGA, RGB, composite), laser printers, computer-screen projection systems, and standards.

MMIS 626 Client-Server and Distributed Computing (3 credits)

Included in this course are a wide range of issues, methods, techniques, and case examples for developing and managing client-server and distributed systems. These include client-server development using RAD methodologies, transaction process monitors, types of abovementioned and middleware, middleware standards (DCE, RPC, and CORBA), managing client-server environments, software installation and distribution, electronic mail architectures in client-server systems, evaluation of vendor strategies, issues in selecting client-server products, legacy system migration issues, interoperability, scalability, network and security concerns, the emerging desktop standards, the role of network computers and thin clients, and the emergence of the Web as an extension of the client-server environment.

MMIS 630 Database Systems (3 credits)

The application of database concepts to management information systems. Design objectives, methods, costs, and benefits associated with the use of a database management system. Tools and techniques for the management of large amounts of data. Database design, performance, and administration. File organization and access methods. The architectures of database systems, data models for database systems (network, hierarchical, relational, and object-oriented model), client-server database applications, distributed databases, and object-oriented databases.

MMIS 631 Database Systems Project (3 credits)

The techniques of database management systems will be applied to practical projects. Prerequisite: MMIS 630.

MMIS 640 System Test and Evaluation (3 credits)

An analysis of the verification and validation process. Methods, procedures, and techniques for integration and acceptance testing. Reliability measurement. Goals for testing. Testing in the small and testing in the large. Allocation of testing resources. When to stop testing. Test case design methods. Black box software testing techniques including equivalence partitioning, boundary-value analysis, cause-effect graphing, and error guessing. White box software testing techniques including statement coverage criterion, edge coverage criterion, condition coverage criterion, and path coverage criterion. Test of concurrent and real-time systems.

MMIS 642 Data Warehousing (3 credits)

This course includes the various factors involved in developing data warehouses and data marts: planning, design, implementation, and evaluation; review of vendor data warehouse products; cases involving contemporary implementations in business, government, and industry; techniques for maximizing effectiveness through OLAP and data mining.

MMIS 652 Computer Security (3 credits)

Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

MMIS 653 Telecommunications and Computer Networking (3 credits)

This course provides a framework for understanding telecommunications fundamentals and computer network functionality, characteristics, and configurations. Topics include wire-free and wire-based communications; network topologies, protocols, and architectures; emerging trends in network technologies and services; and the role of ISDN (Integrated Services Digital Network) and ATM (Asynchronous Transfer Mode) in the corporate environment. Strategies for network planning, implementation, and management are introduced. Recent advances in standardization, internetworking, and deployment of LANs (local area networks), MANs (metropolitan area networks), and WANs (wide area networks) are examined.

MMIS 654 Electronic Commerce on the Internet (3 credits)

Electronic commerce has grown at an incredible rate, and experts forecast extraordinary growth over the near-term and long-term. It will be examined from three perspectives: (1) customer-business; (2) business-business; and (3) intra-organization. The Internet, intranets and extranets, electronic data interchange (EDI), security, electronic payment systems, tax issues, and global policy will be investigated. The student will participate in an Internet shopping experience and create or enhance a Web page.

MMIS 660 Systems Analysis and Design (3 credits)

Analysis of requirements for information systems. Elicitation/fact-finding, problem analysis, decomposition, and the requirements document. Concepts, methods, techniques, and tools for systems analysis, modeling and simulation, and prototyping. Structured and object-oriented analysis. Role of the systems analyst in the organization. Gaining user commitment and fulfilling user needs. Concepts, tools, and techniques for systems design. Design principles, quality factors, decomposition of complex systems, and modularization techniques. Design methods such as object-oriented and function-oriented design. Comparison of analysis and design techniques.

MMIS 661 Object-Oriented Applications (3 credits)

Principles of the object-oriented paradigm. Application of object-oriented methods in management information systems. Object-oriented languages and design methods for class creation. Study of the use of object-oriented techniques in applications such as user interfaces, graphics, database systems, visual programming, hypermedia, office automation systems, and decision support systems. Techniques for software reuse.

MMIS 670 Artificial Intelligence and Expert Systems (3 credits)

This course will include an introduction to artificial intelligence as well as historical and current trends and characterization of knowledge-based systems. Search, logic and deduction, knowledge representation, production systems, and expert systems will be examined. Additional areas include architecture of expert systems and criteria for selecting expert system shells, such as end-user interface, developer interface, system interface, inference engine, knowledge base, and data interface. The student will use a commercial shell to build a working expert system.

MMIS 671 Decision Support Systems (3 credits)

Examines concepts of decision support in both nonautomated and automated environments. Emphasis will be placed on structures, modeling, and the application of various decision support systems in today's corporate environment. Additional emphasis will be placed on the use of executive information and expert system applications. Case studies will be used to look at existent applications of each of these types of technology.

MMIS 680 Human-Computer Interaction (3 credits)

The dynamics of human-computer interaction (HCI). Provides a broad overview and offers specific background relating to user-centered design approaches in information systems applications. Areas to be addressed include the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

MMIS 681 Multimedia Systems (3 credits)

Introduction to multimedia systems. Definitions of terms and concepts related to multimedia. Trends in the development and the use of multimedia. Tools, techniques, and guidelines facilitating the planning, design, production, and implementation of multimedia products.

MMIS 682 Project in Management Information Systems (3 credits)

Students are assigned a project that involves part or all of the system development cycle and gain experience in analyzing, designing, implementing, and evaluating information systems. Prerequisite: Prior consent of instructor.

MMIS 688 Continuing Thesis in Management Information Systems (1.5 credits)

Students who have not completed the thesis by the end of the second thesis registration must register for continuing thesis. This allows the student to receive faculty and administrative advice and support related to the thesis. Prerequisite: Completion of second thesis registration.

MMIS 691 Special Topics in Management Information Systems (3 credits)

This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

MMIS 699 Master's Thesis in Management Information Systems (3 credits)

The student develops a framework within which research will be conducted and offers evidence of qualifications to pursue the research. Concepts and theories underlying the student's thesis research are articulated, the problem is clearly stated, specific, measurable goals are specified, a literature review is presented, the methods of conducting research are delineated, and strategy to achieve the goal is given. Registration for MMIS 699 must be repeated for three more credits, for a total of six thesis credits. Prerequisite: Completion of eight courses.

Master of Science (M.S.) in Computing Technology in Education

This program offers a course of study leading to the master of science (M.S.) in computing technology in education. It is designed to meet the needs of working professionals such as teachers, educational administrators, and trainers working in either the public or the private sector. The program blends educational theory and practice into a learning experience that develops skills applicable to complex real-world problems. It enhances knowledge of how computers, software, and other forms of high technology can be used to improve learning outcomes. Official information about programs and policies is contained in the graduate catalog of the School of Computer and Information Sciences. Many of the courses in the program have been approved for teacher certification in computer science (grades K-12) or recertification by Florida's Bureau of Teacher Certification. They may be taken as part of the degree program or independently. (Satisfactory completion of the master's program does not guarantee that students will meet certificate requirements for the state in which they are employed.)

Program-Specific Admission Requirements (See pp. 2-3 for general admission requirements.)

The applicant must have an earned bachelor's degree in a related field from a regionally accredited institution and extensive experience with computer applications and the World Wide Web.

The Curriculum for the M.S. in Computing Technology in Education

Core courses for the online format are listed below. If the thesis option is elected, two courses may be omitted. Plans for the thesis option must be made with the program office.

MCTE 615	The Internet	MCTE 660	Multimedia Systems
MCTE 625	Survey of Courseware	MCTE 661	Instructional Delivery Systems
MCTE 628	Instructional Systems Design	MCTE 670	Learning Theory and Computer Applications
MCTE 630	Database Systems	MCTE 680	Human-Computer Interaction
MCTE 645	Integrated Applications	MCTE 690	Research Methodology
MCTE 650	Computer Networks	MCTE 691	Master's Project in CTE

Course Descriptions for the M.S. in Computing Technology in Education

MCTE 615 The Internet (3 credits)

The Internet and online information systems associated with the evolving information superhighway. This course emphasizes the development of effective online skills so that bibliographic, full-text, graphical, and numerical information can be accessed in an efficient manner. It also addresses skills and approaches required to teach about the Internet.

MCTE 625 Survey of Courseware (3 credits)

State-of-the-art, content-rich courseware, across the grades, subjects, and platforms, will be explored and evaluated for educational value. Methods for integrating these programs into the curriculum will be discussed. Tutorials, drill and practice, instructional games, simulations, tests, and reference programs are included.

MCTE 628 Instructional Systems Design (3 credits)

This course develops practical instructional systems design competencies appropriate for the development of computer-assisted instruction applications. Students will experience both theory and best practices from the areas of education and training as they develop and acquire instructional systems design skills and knowledge.

MCTE 630 Database Systems (3 credits)

This course covers fundamentals of database architecture, database management systems, and database systems. Principles and methodologies of database design, and techniques for database application development.

MCTE 645 Integrated Applications (3 credits)

This course provides experience with the multiple roles of electronic spreadsheets, databases, and graphs in teaching, learning, and the management of instruction. Using an integrated software package, these tools will be used to develop and reinforce skills in organizing, problem solving, generalizing, predicting, decision making, and hypothesizing.

MCTE 650 Computer Networks (3 credits)

This course provides a framework for understanding computer network functionality, characteristics, and configurations. Topics include network topologies, protocols, and architectures; emerging trends in network technologies and services; and the role of ISDN (Integrated Services Digital Network) and ATM (Asynchronous Transfer Mode) in the educational environment. Strategies for network planning, implementation, management, and security are introduced. Recent advances in standardization, internetworking, and deployment of LANs (local area networks), MANs (metropolitan area networks), and WANs (wide area networks) are examined.

MCTE 660 Multimedia Systems (3 credits)

Recent advances and future trends in learning technology and educational computing are examined. Innovations in teacher and student workstation technology are reviewed. Emphasis is placed on an examination of audio/video and computer-based tools currently in use in schools and training centers. Special attention is given to CD-ROM technology and laser disc technology. Guidelines for selection and implementation of multimedia projects are presented.

MCTE 661 Instructional Delivery Systems (3 credits)

An investigation of the expansion and applications of instructional delivery systems, such as electronic delivery via telecommunications (email, electronic bulletin boards, conferencing systems), electronic classrooms or electronic whiteboards, audioconferencing, compressed video, World Wide Web (including HTML interfaces), group support systems, computer-aided instruction, broadcast via satellite, and multimedia. Comparative evaluation of instructional delivery systems.

MCTE 670 Learning Theory and Computer Applications (3 credits)

Students will explore learning theories and how learning is achieved when instruction is presented from a computer-based paradigm. The course will emphasize the computer as a learning device that can be used in an effective manner to model learning theories associated with behaviorism, cognitivism, and human information processing.

MCTE 680 Human-Computer Interaction (3 credits)

Explores the emerging field of human-computer interaction. Emphasis is placed on how software design practices are integrated with human factors, principles, and methods. Other issues covered include user experience levels, interaction styles, usability engineering, interaction devices and strategies, user-centered design, human information processing, social aspects of computing, and computer-supported cooperative work.

MCTE 688 Continuing Thesis in Computing Technology in Education (1.5 credits)

Students who have not completed the thesis by the end of the second thesis registration must register for continuing thesis. This allows the student to receive faculty and administrative advice and support related to the thesis. Prerequisite: Completion of second thesis registration.

MCTE 690 Research Methodology (3 credits)

This course is an introduction to research, statistical analysis, and decision making. Close attention is paid to data types, data contributions, the identification of variables, and descriptive data presentation techniques. Students are introduced to both parametric and nonparametric data analysis procedures including independent and dependent sample t-tests, chi-square analysis, and simple analysis of variance. Hypothesis testing and the use of statistical software packages are emphasized.

MCTE 691 Master's Project in Computing Technology in Education (3 credits)

This course is the capstone of the program. Each student will develop a comprehensive technology-based project using an environment of choice. Its purpose is to allow students the opportunity to further pursue topics or areas in which they have considerable interest. Each project will be closely mentored by faculty.

MCTE 695 Special Topics in Computing Technology in Education (3 credits)

This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

MCTE 699 Master's Thesis in Computing Technology in Education (3 credits)

The student develops a framework within which research will be conducted and offers evidence of qualifications to pursue the research. Concepts and theories underlying the student's thesis research are articulated, the problem is clearly stated, specific, measurable goals are specified, a literature review is presented, the methods of conducting research are delineated, and strategy to achieve the goal is given. Registration for MCTE 699 must be repeated for three more credits, for a total of six thesis credits. Prerequisite: Completion of eight courses.

Faculty and Staff of The School of Computer and Information Sciences

The Faculty

Gertrude W. Abramson, Ed.D., Columbia University. Professor. Computer-supported education, hypermedia/multimedia, instructional systems design and development, distance learning, instruction delivery systems.

James Cannady, Ph.D., Nova Southeastern University. Assistant Professor. Information security, artificial neural networks, distributed computing, machine learning, artificial intelligence.

Maxine S. Cohen, Ph.D., State University of New York at Binghamton. Associate Professor. Human-computer interaction, multimedia, usability engineering, database systems, distance education.

Laurie P. Dringus, Ph.D., Nova Southeastern University. Associate Professor. Human-computer interaction, group support systems, usability engineering, learning theory, distance learning.

Timothy J. Ellis, Ph.D., Nova Southeastern University. Assistant Professor. Multimedia, distance education, the Internet as a tool for education and commerce, adult education, networks and electronic communication.

George K. Fornshell, Ph.D., Nova Southeastern University. Associate Professor. Instructional systems development, multimedia, authoring systems, human factors, distance education.

William L. Hafner, Ph.D., Nova Southeastern University. Assistant Professor. Human-computer interaction, data warehousing, information storage and retrieval, computer security, artificial intelligence.

William M. Hartman, Ph.D., Nova Southeastern University. Lecturer. Software engineering, data communications, computer networks, decision support systems, mathematics in computing.

Michael J. Laszlo, Ph.D., Princeton University. Associate Professor. Data structures and algorithms, software engineering, programming, computer graphics.

Jacques Levin, Ph.D., University of Grenoble. Professor. Database management, modeling, distance education, decision support systems, numerical analysis.

Edward Lieblein, Ph.D., University of Pennsylvania. Professor and Dean. Software engineering, object-oriented design, programming languages, automata theory.

Marlyn Kemper Littman, Ph.D., Nova Southeastern University. Professor. Computer networks, ATM, wirefree and wire-based communications, network security, distance learning.

Frank Mitropoulos, M.S., Nova Southeastern University. Instructor. Programming languages, data structures, software engineering, object-oriented design, C, C++, Java.

Sumitra Mukherjee, Ph.D., Carnegie Mellon University. Associate Professor. Database, decision support systems, information systems, network security, artificial intelligence, telecommunications.

Paul Rendulic, Ed.D., Florida International University. Associate Professor. Research methodology and statistics; learning theory; survey design, development, and analysis; and program evaluation.

John Scigliano, Ed.D., University of Florida. Professor. Management information systems, client-server computing, project management, instruction delivery systems.

Greg Simco, Ph.D., Nova Southeastern University. Assistant Professor. Operating systems, data communications, computer networks, client-server computing, online learning environments, C++, Java.

Junping Sun, Ph.D., Wayne State University. Associate Professor. Database management systems, object-oriented database systems, artificial neural networks.

Raisa Szabo, Ph.D., Budapest Technical Institute. Instructor. Computer architecture, artificial intelligence, neural networks, robotics, operations research, concurrent languages.

Steven R. Terrell, Ed.D., Florida International University. Professor. Research methodology and statistics, learning theory, distance education, computer-managed instruction.

Visiting and Adjunct Faculty

Anne Abate, Ph.D.

Richard Manning, Ph.D.

David Metcalf II, Ph.D.

Lee Leitner, Ph.D.

Ronald McFarland, Ph.D.

Robert Lipton, Ph.D.

Terry McQueen, D.B.A.

Steven Zink, Ph.D.

Teaching Assistants

Mohamad Foustok, M.S.

Jon Inouye, M.S.

The Administrative and Technical Staff

Admissions

Clare Singer, B.S., Director ext. 2003, singerc
Nancy Azoulay, B.S., Assistant Director ext. 2026, azoulayn
Richard North, Admissions Representative ext. 2002, rnorth1
Josette Davis, M.S., Admissions Representative ext. 2004, davisjos
Irene Stringer, Coordinator ext. 2001, stringer
Kenneth Mattis, B.A., M.M., Coordinator ext. 2005, mattiske
Cameran Morgan, B.A., Administrative Secretary ext. 2025, morganca
Angela Avello, Clerical Assistant ext. 2008, avello

Master's Program Office

Eric Ackerman, Ph.D., Director ext. 2063, esa
Kimberley Driscoll, M.S., Adviser ext. 2062, kimsd
Elizabeth Koenig, B.S., Adviser ext. 2061, koenige
Kristen Oldberg, Assistant to the Director ext. 2010, oldbergk
Lauren Piazza, Administrative Secretary ext. 2060, piazza

Network and Software Services

Mark Powell, B.S., Senior Coordinator ext. 2015, powelma
Will Ferri, B.S., Coordinator ext. 2014, ferriw
Theodore Leonard, A.A., Coordinator ext. 2016, theo

Dean's Office

Edward Lieblein, Ph.D., Dean ext. 2034, lieblein
Bellarmin Selvaraj, Ph.D., Director, Research and Planning ext. 2048, selvaraj
Candy L. Fish, M.S., Operations Manager and Executive Asst. to the Dean ext. 2034, fishc
L. Kathleen Bryan, Coordinator, Faculty Support ext. 2032, bryankat
Dawn Sawyers, B.S., Receptionist ext. 2031, sawyerda

Doctoral Program Office

Diane King, Ph.D., Director ext. 2054, kingdi
Sharon Brown, B.A., Assistant Director ext. 2056 sharonb
Crystal Darville, Coordinator ext. 2053, darville
Sylvia Yepes, B.A., Coordinator ext. 2052, yepessil
Elizabeth Wardlaw, A.A., Administrative Secretary ext. 2050, ewardlaw

Finance and Administration

Barbara Edge, M.S., Director ext. 2043, barb
Claudia Chong, Manager ext. 2041, chongc
Elizabeth Vayda, Coordinator ext. 2042, vaydab
Ramona Moussignac, Coordinator ext. 2044, woodsr
Raysa Andrade, Assistant to the Director ext. 2040, andrade



Nova Southeastern University

School of Computer and Information Sciences

Master of Science Degree Programs

ADMISSION FORMS

The faculty and administration of the School of Computer and Information Sciences (SCIS) are pleased that you have chosen to apply for admission. The admissions application should be accompanied by a \$50 application fee (make checks payable to Nova Southeastern University).

Admission decisions are made on a rolling basis. To ensure evaluation for the desired starting term, reviewable applications must be received at least one month prior to the start of that term. Late applications that cannot be processed in time for the desired starting term will be considered for the next available term. Applicants may be granted *provisional admission* status pending completion of the application process.

To ensure that your application is complete, please use the checklist below and follow the detailed instructions provided for each item. Degree-seeking applicants must attend to items 1 through 7. If you are not pursuing a degree from the School of Computer and Information Sciences but wish to take courses as a non-degree student you must attend to the items marked with an asterisk (*).

- ___ 1. Application Form*
- ___ 2. Application Fee or Reinstatement Fee*
- ___ 3. Essay
- ___ 4. Summary of Professional Experience or GRE Scores
- ___ 5. Three Evaluation Forms
- ___ 6. Transcript Request Form(s)*
- ___ 7. Request for UNIX™ Account Form*

Please mail items 1 through 4 and item 7 to:

Nova Southeastern University
School of Computer and Information Sciences
Office of Admissions
6100 Griffin Road
Fort Lauderdale, FL 33314-4416

For items 5 and 6, please follow the mailing instructions specified in the forms.

If you have any questions about the admissions process you may contact the Office of Admissions at (954) 262-2000 or toll free at 800-986-2247, or send email to scisinfo@nova.edu.

APPLICATION FORM
Master of Science Programs

FOR OFFICE USE ONLY

Application Fee \$50 (nonrefundable)

Nova Southeastern University
School of Computer and Information Sciences
Office of Admissions
6100 Griffin Road
Fort Lauderdale, Florida 33314-4416
800-986-2247 or (954) 262-2000
Fax: (954) 262-3915

Cluster Code: _____	Fee Rec'd: _____
Admit Status: _____	Major Code: _____
Admit Action: _____	Admit Type: _____
Apply Class: _____	Degree Code: _____
Rec'd: _____	Spec. Code: _____
Date Processed: _____	

PERSONAL DATA:

Social Security Number: _____ - _____ - _____ Date of Birth: ____/____/____
Sex: Male Female
Home Telephone: () _____ Email Address: _____

Last Name First Name MI Maiden
Mailing Address: _____
City: _____ State: _____ ZIP: _____ Country: _____

EMPLOYMENT INFORMATION:

Employer: _____ Job Title: _____
Address: _____ City: _____ State: _____ ZIP: _____
Work Telephone Number: () _____

EMERGENCY CONTACT:

Name: _____ Telephone: () _____ Relationship: _____
Address: _____ City: _____ State: _____ ZIP: _____

ANTICIPATED START DATE:

Fall Winter Spring Summer Year: _____

ACADEMIC GOAL: (Please check the appropriate box.)

Master's Degree (M.S.) Reinstatement (\$50 fee)
 Non-Degree-Seeking Student

PROGRAMS: (Please select the program of interest **and** the desired format.)

Computer Information Systems (CIS) Online or Campus-Based
 Computer Science (CS) Online or Campus-Based
 Computing Technology in Education (CTE) Online only
 Management Information Systems (MIS) Online or Campus-Based

APPLICANT STATUS AT TIME OF APPLICATION:

First time attending NSU? YES NO Returning to NSU after absence? YES NO

You must complete this section or your application will not be processed.

Name of Institution	Country or State	Date Started	Date Ended	Major Field	Degree Earned	GPA

Will you request a transfer of any graduate-level credits toward your degree? YES NO

(Up to six graduate credits may be transferred from a regionally accredited institution.)

If YES, provide course descriptions, course syllabi, and transcripts for courses you wish to transfer:

Course Number	Course Name	Institution	Dates	Grade Received

CITIZENSHIP STATUS: U.S. Citizen Resident Alien Nonresident Alien

Do you require an I-20? YES NO If you have a visa, indicate status code: _____

Country of Citizenship: _____ (Additional procedures are required for nonresident aliens.)

Is English your primary language? YES NO (If no, a TOEFL score of 550 or higher is needed.)

FINANCIAL AID: Have you filed for Financial Aid? YES NO

Have you filed a Free Application for Federal Student Aid (FAFSA)? YES NO

If yes, when was the FAFSA mailed? _____ Are you eligible for VA benefits? YES NO

COMPUTER EXPERIENCE AND EQUIPMENT:

How would you rate your overall computer ability: **Please circle: 0 1 2 3 4 5**

0 = No experience 3 = Ability to use standard applications software 5 = Very Experienced

Are you able to upload and download files via the Internet? YES NO

What programming languages can you use with a high degree of proficiency? (Please use a separate sheet, if necessary, to explain your experience with these languages.)

What application programs can you use with a high degree of proficiency?

7

HOW DID YOU FIRST HEAR ABOUT THIS PROGRAM? Please check appropriate box.

- | | |
|--|--|
| <input type="checkbox"/> Friend/Colleague | <input type="checkbox"/> Web Site (specify) _____ |
| <input type="checkbox"/> NSU Staff Member | <input type="checkbox"/> Newspaper (specify) _____ |
| <input type="checkbox"/> NSU Student or Graduate | <input type="checkbox"/> Information Meeting (where) _____ |
| <input type="checkbox"/> Direct Mail | <input type="checkbox"/> Conference (specify) _____ |
| <input type="checkbox"/> TV or Radio Commercial | <input type="checkbox"/> Magazine (specify) _____ |
| <input type="checkbox"/> SREC | <input type="checkbox"/> Other (specify) _____ |

Family Educational Rights and Privacy Act (Buckley Amendment)

Please check the appropriate phrase and sign your name.

Pursuant to the Buckley Amendment enacted on December 31, 1974,

I DO _____ **or** **DO NOT** _____

give permission for my name, address, and/or phone number to be used for promotional purposes.

Applicant's Signature

Date

I DECLARE THAT THE INFORMATION CONTAINED IN THIS APPLICATION, TO THE BEST OF MY KNOWLEDGE, IS COMPLETE AND ACCURATE. I AGREE TO ABIDE BY ALL RULES AND REGULATIONS OF NOVA SOUTHEASTERN UNIVERSITY.

Applicant's Signature

Date

NOTICE OF NONDISCRIMINATION

Nova Southeastern University admits students of any race, color, sex, age, nondisqualifying disability, religion or creed, or national or ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school, and does not discriminate in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs.

Nova Southeastern University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; Telephone number 404-679-4501) to award bachelor's, master's, educational specialist, and doctoral degrees.

**School of Computer and Information Sciences
Nova Southeastern University**

**ESSAY
(Please use separate sheets)**

The content of your essay, as well as the quality of your writing, will be evaluated by the Admissions Committee. The essay should contain a minimum of 500 words. You should discuss your reasons for pursuing this degree, why you decided to apply to Nova Southeastern University, the nature of your work, your long-term goals, and any other topics you wish to bring to the attention of the Admissions Committee.

Certification of Authorship of Essay

(Attach this form to the essay.)

Applicant's Name: _____

Date: _____

Certification of Authorship: I hereby certify that I am the author of this essay and that any assistance I received in its preparation is fully acknowledged and disclosed in this document. I have also cited all sources from which I obtained data, ideas, or words that are copied directly or paraphrased in the document. Sources are properly credited according to accepted standards for professional publications.

Applicant's Signature: _____

**School of Computer and Information Sciences
Nova Southeastern University**

SUMMARY OF PROFESSIONAL EXPERIENCE (or GRE Scores)

Please submit a Summary of Professional Experience or GRE scores. These will be evaluated thoroughly to determine, in part, your potential ability to succeed in graduate studies. The Summary of Professional Experience is a special type of resume designed to highlight the skills and knowledge you have gained through your professional career. *The importance of detail and completeness in the preparation of this summary cannot be underestimated.*

The following areas should be included in the Summary of Professional Experience:

1. **Employment history** (specific job titles and dates). Include all relevant work experience including job descriptions and responsibilities.
2. **Experience with computer systems.** List relevant computer-based work experiences with operating systems, software, hardware computer languages, teleconferencing, multimedia, and video. Describe the nature and length of experiences.
3. **Workshops, seminars, conferences, and special meetings attended** (list topics). Technical education course work should be fully documented. You may include course descriptions to support relevance of courses you have taken. Provide a detailed description of the learning activities that you have participated in at conferences.
4. **Publications, proposals, and reports you have authored.** Writing is a critical success factor in graduate work. Your Summary of Professional Experience should be used to highlight your writing abilities and scholarship potential. Where appropriate, provide a detailed list covering the following areas (titles, dates, coauthors, and publishers should be listed):
 - ◆ Grants
 - ◆ Professional Publications
 - ◆ Proposals
 - ◆ Reports
 - ◆ Other
5. **Technology accomplishments of significance.** Provide detailed descriptions of your roles and contributions.
6. **Awards, achievements, or special recognition you have received.** Provide a list.
7. **Membership and offices held in professional organizations.** Identify special roles and functions you may have performed.

While the above areas are specific, you should tailor the contents of each section to support your acceptance into the SCIS program of your intent. Special attention should be given to your strengths. Your goal is to provide the most effective materials that prove you have an adequate background to enter and succeed in the specialization area in which you are seeking your master's degree.

**School of Computer and Information Sciences
Nova Southeastern University**

EVALUATION FORM

(Please photocopy this form as necessary)

TO THE APPLICANT: Please send this form to individuals who are familiar with your academic and/or professional capabilities and are able to assess your intellectual abilities, maturity, and motivation. Forms from family members or individuals who are unable to evaluate your academic or professional background are unacceptable.

TYPE OR PRINT THE FOLLOWING INFORMATION:

Applicant's Name:

Last Name First Name MI SS#: ____ - ____ - ____

Mailing Address: _____

City: _____ State: _____ ZIP: _____ Country: _____

Present Occupation: _____ Employer/Institution: _____

Degree Sought: _____ Program: _____

Expected Date of Entry: _____

NAME AND TITLE OF EVALUATOR:

Family Educational Rights and Privacy Act (Buckley Amendment)

Under the provisions of this act, you have the right, if you enroll at Nova Southeastern University, to review your educational records. The act further provides that you may waive your right to see recommendations for admission. Please indicate below by checking the appropriate phrase and signing your name whether or not you wish to waive that right.

I WAIVE ____ **or** **DO NOT WAIVE** ____ any right that I have to this recommendation.

Applicant's Signature: _____ Date: _____

TO THE EVALUATOR: The person named on the previous page has applied for admission to a master's degree program at the School of Computer and Information Sciences, Nova Southeastern University. You are being asked to evaluate his/her potential for success in this program.

1. How long have you known the applicant and in what capacity? (Give dates, if possible.)

2. Estimate of Potential As a Degree Candidate:

_____ Outstanding _____ Above Average _____ Average _____ Below Average

3. Recommendation concerning admissions (check one):

_____ I recommend the applicant with confidence.

_____ I recommend the applicant with reservation.

_____ I do not recommend the applicant.

4. (For teachers of applicant only.) I would rank this applicant in the top ____% of approximately

_____ undergraduate or _____ graduate students I have taught in the past _____ years.

5. Please rate the applicant in each area listed below in comparison with others you have known:

	UPPER 5%	UPPER 10%	UPPER 25%	UPPER 50%	LOWER 50%	NO BASIS TO JUDGE
Intellectual Ability						
Oral Expression						
Written Expression						
Motivation/Initiative						
Cooperation						
Emotional Maturity						
Dependability						
Creativity						
Ability to Work with Others						
Ability to Work Independently						
Ability to Reason						
Overall Potential						

Please provide any additional assessment of the applicant's potential for success in graduate school. Include any particular strengths and/or weakness. We would appreciate your candid appraisal. Attach separate sheets if necessary.

Name: _____

Signature: _____

Position: _____

Date: _____

Organization: _____

Phone: _____

Please return this form to:

Nova Southeastern University
 School of Computer and Information Sciences
 Office of Admissions
 6100 Griffin Road
 Fort Lauderdale, Florida 33314-4416

TRANSCRIPT REQUEST FORM

(Please photocopy this form as necessary)

TO THE APPLICANT: It is important that transcript requests are sent to your previous school(s) in a timely fashion in order to aid in the admission process. Fill in the blanks on both parts of the form. It is suggested that you call your previous school(s) to find out if a fee should accompany this transcript request form. Mail the entire form and any fee required to your previous school(s).

TO PREVIOUS SCHOOL/COLLEGE:

Please send an official transcript of my academic work while attending your institution to the School of Computer and Information Sciences at Nova Southeastern University.

A. I attended your institution from _____ to _____

B. While in attendance, my name was:

Last First MI Maiden

C. My student identification number was: _____

Signature

PREVIOUS SCHOOL: PLEASE RETURN THIS FORM WITH TRANSCRIPT. THANK YOU.

TRANSCRIPT TRANSMITTAL FORM

Social Security Number _____ Date _____

Name _____

Last First MI Maiden

Address _____

City _____ State _____ ZIP _____

Please send one official transcript to:

**NOVA SOUTHEASTERN UNIVERSITY
School of Computer and Information Sciences
Office of Admissions
6100/Griffin Road
Fort Lauderdale, FL 33314-4416**

School of Computer and Information Sciences
REQUEST FOR UNIX™ ACCOUNT

NAME: _____ SS#: _____ - _____ - _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

HOME PHONE: () _____ WORK PHONE: () _____

DEGREE PROGRAM	
Please indicate your degree program by checking the appropriate box	
MASTER'S	
<input type="checkbox"/> Computer Science	<input type="checkbox"/> Management Information Systems
<input type="checkbox"/> Computer Information Systems	<input type="checkbox"/> Non-Degree
<input type="checkbox"/> Computing Technology in Education	
DOCTORAL	
<input type="checkbox"/> Computer Science	<input type="checkbox"/> Information Science
<input type="checkbox"/> Computer Information Systems	<input type="checkbox"/> Information Systems
<input type="checkbox"/> Computing Technology in Education	<input type="checkbox"/> Non-Degree

Which is your preferred operating system for accessing NSU's Unix™ systems?

Windows 95 (or higher) Macintosh System 8.0 (or higher) Other

Name of your Internet service provider (ISP)? _____

All students are required to have an ISP. If you do not have an ISP, please call (954) 262-2016 for instructions.

IMPORTANT:

I have read and understand the computing account security agreement, policies on acceptable use, and use of material in Web pages policy contained in this application package and agree to abide by them.

Student Signature (required)

Date

ACCOUNT INFORMATION - FOR OFFICE USE ONLY	
ESTABLISHED: _____	GROUP: _____
USERNAME: _____	QUOTA: _____
PASSWORD: _____	RESOURCE: _____

Nova Southeastern University

COMPUTING ACCOUNT SECURITY AGREEMENT

Nova Southeastern University has adopted rules for computing. The following rules outline your responsibilities for securing your computing account. This is not, however, a comprehensive list of all online policies, procedures, and responsibilities. Consult the NSU Policy Regarding Use of Computers and Network Systems. If you misuse your account, these privileges may be withheld. You must read and agree to abide by this agreement by signing your account request form before your account can be activated.

Your computer account is to be used only by you. Do not share your account with other individuals. The password to your account must be kept secure. Make sure you commit your password to memory. You may change your password at any time with the *passwd* command. Always choose a password that is difficult to guess. Your password should conform to the following rules:

- It must be eight characters in length.
- It must not be any word that may be found in a dictionary.

Choose a password that is meaningful to you but not obvious to anyone else. Examples of acceptable passwords are: 29py94ju, x#jk*azd, 1^xx%bcd.

NSU computer systems will automatically monitor your password on a regular basis. If your password is "guessed" by the system, you will be sent electronic mail indicating that this has happened. If this occurs, change your password immediately to prevent anyone from tampering with your account.

It is your responsibility to make backups of your files on your own computer. NSU is not responsible for the loss of your computer files.

There are no specific limits to online time; however, you are encouraged to use your online time wisely in order to conserve resources. Online time that has been excessive and/or used for unauthorized purposes can result in a charge to you.

If you do not access your account for a period of one year, your account will be reviewed and may be deactivated. You must contact your account coordinator to request reactivation of your account.

If you have trouble accessing your account or forget your password, please contact your account coordinator. He/she can facilitate any changes needed to get you working again.

**School of Computer and Information Sciences
Nova Southeastern University**

Policy on Acceptable Use of Computing Resources

This policy provides guidelines for the appropriate and inappropriate use of the computing resources of Nova Southeastern University. It applies to all users of the university's computing resources, including students, faculty members, staff, alumni, and guests of the university. Computing resources include all computers, related equipment, software, data, and local area networks for which the university is responsible, as well as networks throughout the world to which the university provides computer access.

The computing resources of Nova Southeastern University are intended to be used for its programs of instruction and research and to conduct the legitimate business of the university. All users must have proper authorization for the use of the university's computing resources. Users are responsible for seeing that these computing resources are used in an effective, ethical, and legal manner. Users must apply standards of normal academic and professional ethics and considerate conduct to their use of the university's computing resources. Users must be aware of the legal and moral responsibility for ethical conduct in the use of computing resources. Users have a responsibility not to abuse the network and resources, and to respect the privacy, copyrights, and intellectual property rights of others.

In addition to the policy contained herein, usage must be in accordance with applicable university policies (see "Related Policies" listed elsewhere in this policy) and applicable state and federal laws. Among the more important laws are the Florida Computer Crimes Act, the Federal Computer Abuse Amendment Act 1994, the Federal Electronic Communications Privacy Act, and the U.S. Copyright Act. Copies of these laws and the NSU copyright policy may be examined in the Office of Academic Affairs.

Policy violations generally fall into five categories that involve the use of computing resources:

1. for purposes other than the university's programs of instruction and research and the legitimate business of the university
2. to harass, threaten, or otherwise cause harm to specific individuals or classes of individuals
3. to impede, interfere with, impair, or otherwise cause harm to the activities of others
4. to download, post, or install to university computers, or transport across university networks, material that is illegal, proprietary, in violation of license agreements, in violation of copyrights, in violation of university contracts, or otherwise damaging to the institution
5. to recklessly or maliciously interfere with or damage computer or network resources or computer data, files, or other information

Examples (not a comprehensive list) of policy violations related to the above five categories include:

- using computer resources for personal reasons
- sending email on matters not concerning the legitimate business of the university
- sending an individual or group repeated and unwanted (harassing) email or using email to threaten someone
- accessing, or attempting to access, another individual's data or information without proper authorization (e.g., using another's computing account and password to look at his/her personal information)
- propagating electronic chain mail, pyramid schemes, or sending forged or falsified email
- obtaining, possessing, using, or attempting to use someone else's password, regardless of how the password was obtained

- copying a graphical image from a Web site without permission
- posting a university site-licensed program to a public bulletin board
- using illegally obtained licensed data/software, or using licensed data/software in violation of its license or purchase agreement
- releasing a virus, worm, or other program that damages or otherwise harms a system or network
- preventing others from accessing services
- attempting to tamper with or obstruct the operation of NSU's computer systems or networks
- using or attempting to use NSU's computer systems or networks as a means for the unauthorized access to computer systems or networks outside the university
- viewing, distributing, downloading, posting, or transporting child, or any, pornography via the Web, including sexually explicit material for personal use that is not required for educational purposes
- using university resources for unauthorized purposes (e.g., using personal computers connected to the campus network to set up Web servers for illegal, commercial, or profit-making purposes)
- violating federal copyright laws or the NSU copyright policy

Inappropriate conduct and violations of this policy will be addressed by the appropriate procedures and agents (e.g., the Office of the Dean, the Office of the Vice President for Academic Affairs, or the Office of Human Resources) depending on the individual's affiliation to the university. In cases where a user violates any of the terms of this policy, the university may, in addition to other remedies, temporarily or permanently deny access to any and all NSU computing resources, and appropriate disciplinary actions may be taken, up to and including dismissal.

RELATED POLICIES:

Student-Related: Student Code of Conduct and Academic Integrity

Faculty-Related: Faculty Policy Manual

Staff-Related: Employee Handbook

General Policies: Copyright and Patent Policy

Computing Account Security Agreement

Policy on the Use of Material in Web Pages

The School of Computer and Information Sciences

Policy on the Use of Material in Web Pages

You should assume that materials you find on the Web are copyrighted unless a disclaimer or waiver is expressly stated. You may not place any materials owned by others, i.e., copyrighted works, on your Web page(s) without the expressed permission of the copyright owner. (Examples: graphic images from other Web pages, articles, video, audio, photographs, software, or images scanned from published works.) You may include short quotations of text, provided you identify in an obvious way (e.g., in a footnote) the author and the work from which the quotation is taken. If you want to include something from another Web page in one of your Web pages, then link to it rather than copy it. The occurrence of plagiarism on your Web page is subject to the same sanctions that apply to plagiarism in any other media. Images in the NSU graphics repository may be used on Web pages without permission. Clip art images provided with licensed software may be used if permitted in the license agreement for such software. You may not place any pictures or videos of people on a Web page without the expressed permission of the people in the picture or video. Every person has a right to privacy, which includes the right to restrict the use of his/her own image. In addition, the picture or video may be protected by copyright.

If you have received formal permission to use material owned by another, place the following notice on the page that contains the copied material:

Copyright <year of copyright> by <name of the copyright owner>. Used with permission.

Although a copyright notice is not required to assert your rights to your own original material, you may want to include a minimal notice of copyright in a Web page footer when appropriate. When used, the copyright notice should appear as follows*:

Individual Web pages:

Copyright <year of copyright> <your name>. All Rights Reserved.

Organization Web pages (examples):

Copyright 2000 Cornell Law Review. All Rights Reserved.

Copyright 1997 Nova Southeastern University. All Rights Reserved.

Copyright 1999 the School of Computer and Information Sciences. All Rights Reserved.

Related policies that also apply to Web pages are as follows:

1. General Policies:

Policy on Acceptable use of Computing Resources

Copyright and Patent Policy

Computing Account Security Agreement

2. Student-related: Student Code of Conduct and Academic Integrity (in SCIS Graduate Catalog)

3. Faculty/Administrator-related: Faculty/Academic Administrator Policy Manual

4. Staff-related: The NSU Employee Handbook

*The symbol © may be used in lieu of “copyright” or immediately after it.



School of Computer and Information Sciences

What are my computer requirements?

You must have an active account with an Internet Service Provider (ISP) before starting the program. Students may use either a IBM-compatible PC or Apple/Macintosh computer for their online studies. The following are *minimum* computer system requirements:

IBM-compatible PC:

- Pentium 200MMX processor or higher, Pentium II (or higher) processor recommended
- Windows 95 or Higher, Windows NT 4 or Higher
- 64 Megabytes of RAM (or higher)
- 28.8kb Modem (or faster) internet connection through an account on an ISP (Internet Service Provider), or a network connection to the Internet. Please note that your connection to the internet must **not** initiate from behind a **firewall**
- floppy/CD-ROM/hard drive
- Full Duplex Sound card with speakers/headphones and microphone
- SVGA(1024 x 768) or higher display

Macintosh:

- PowerPC 120Mhz processor or higher, G3 processor recommended. If you have an older Macintosh, you may check the Apple Product Info Archive to see what processor it has
- System 8.0 or higher operating system
- 64 Megabytes of RAM (or higher)
- 28.8kb Modem (or faster) internet connection through an account on an ISP (Internet Service Provider), or a network connection to the Internet.. Please note that your connection to the internet must **not** initiate from behind a **firewall**
- floppy/CD-ROM/hard drive
- Full Duplex Sound with a microphone.
- 1024 x 768 or higher display resolution, thousands of colors

Software:

- Netscape 4.04 or higher, or Microsoft Internet Explorer 4.0 or higher. Please note that proprietary browser versions (those not downloaded directly from Netscape or Microsoft) may not work reliably with SCIS On-Line systems
- Suggested: Microsoft Office 97 (or higher). If you use other "office" type programs, please note that some professors may **require** you to convert your files to a MS-Office compatible format for online submission



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